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LOW FLOWS AND FLOW DURATION OF TENNESSEE STREAMS THROUGH 1981

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 84-4347



Prepared in cooperation with the

TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT,

DIVISION OF WATER MANAGEMENT

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R. H. Bingham

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Nashville, Tennessee

1985

UNITED STATES DEPARTMENT OF THE INTERIOR

WILLIAM P. CLARK, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information
write to:

District Chief
U.S. Geological Survey
A-413 Federal Building
U.S. Courthouse
Nashville, Tennessee 37203

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CONVERSION FACTORS

Analyses and compilations used in the report are in inch-pound units of measurements. Factors for converting inch-pound units to metric (SI) units are listed below.

<u>Multiply</u>	<u>By</u>	<u>To obtain</u>
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi ²)	2.590	square kilometer (km ²)
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)

LOW FLOWS AND FLOW DURATION OF TENNESSEE STREAMS THROUGH 1981

R. H. Bingham

ABSTRACT

Estimates of low-flow characteristics and flow duration for the period of record at continuous-record streamflow gages are essential in hydrologic studies and water-resources management. This report provides estimates of low flow for 1, 3, 7, 14, 30, 60, and 90 consecutive days for recurrence intervals of 2, 5, 10, and 20 years for continuous-record streamflow gages. These estimates were used in correlation methods to estimate low flow at partial-record streamflow sites for 1, 3, and 7 consecutive days for a recurrence interval of 10 years; and 3 consecutive days for a recurrence interval of 20 years.

INTRODUCTION

Optimum development of surface-water resources requires knowledge of the rate of sustained streamflow during periods of low flow. The low flow in streams in Tennessee is a critical factor when dealing with problems related to water supplies, dilution and conveyance of wastes, irrigation, transportation, recreation, fish and wildlife conservation, and environmental enhancement and preservation. For example, specific information concerning low flow may be used to determine whether a water-utilization project can be operated without storage facilities. Low-flow information is also essential in water-quality management where the quantity of water is a critical factor for diluting and transporting wastes.

In response to increasing needs for low-flow information, the U.S. Geological Survey, in cooperation with the Tennessee Department of Health and Environment, Division of Water Management, began a study in 1981 to estimate low flow characteristics of streams in Tennessee. Flow information is available at 201 continuous-record gaging stations having lengths of record ranging from 5 to 70 years, and at 769 low-flow partial-record stations. Station locations are shown on plate 1. Low-flow frequency curves and flow-duration curves were computed from those continuous-record stations having more than 10 years of record. Low flows are characterized by discharges at selected recurrence intervals as defined by the frequency curves. For continuous-record stations having less than 10 years of record and for partial-record stations, selected low-flow characteristics were estimated by correlation with continuous-record stations having longer records.

Four reports (Eaton, 1958; Wood and Johnson, 1965; May and others, 1970; Gold, 1981) describe low flow or flow duration of Tennessee streams.

This report is based on streamflow data collected through climatic and water year 1981¹ as part of programs with Federal, State, and municipal agencies. Low-flow data for some streams in the Cumberland River basin were furnished by the U.S. Army Corps of Engineers, and data for some streams in the Tennessee River basin were furnished by the Tennessee Valley Authority. The Tennessee Valley Authority also identified periods of unregulated, transition, and regulated flow for selected streams in the Tennessee River basin. Low flows for unregulated flow periods and for regulated flow periods are given on separate pages in this report. Transition period represents construction and filling of the reservoir and was omitted from the analyses.

METHOD OF ANALYSES

Low-flow frequency curves were derived for 201 continuous-record gages as described in Riggs (1972) and by an adaptation of the log-Pearson Type III flood-frequency program described in U.S. Water Resources Council Bulletin 17B (1981). Results of the mathematical analyses were adjusted for stations having periods of zero flow, and for stations where significant differences in the plotting positions of observed and predicted values occurred (Riggs, 1972). Low-flow characteristics for 769 low-flow partial-record stations were estimated by correlating measurements at the stations with concurrent discharges at continuous-record stations.

Low-Flow at Continuous-Record Gages

Low-flow characteristics for continuous-record gages are the discharges taken from a frequency curve of annual (climatic year) values of the lowest mean discharge for a given number of consecutive days. The frequency curve for each gage was derived using computer programs based on the log-Pearson Type III distribution, adapted from the U.S. Water Resources Council Bulletin 17B (1981). Input values to the programs are annual minimum average flows for periods of 1, 3, 7, 14, 30, 60, and 90 consecutive days. The recurrence interval (in years) and low flow (parameter value) for the recurrence interval are the coordinates of the frequency curve. Figure 1 illustrates input values for a 3-day period and results of log-Pearson analyses for the Harpeth River at Bellevue.

Data for some gages (such as Harpeth River at Bellevue) contain zero values in the annual series of low flow. In that case, the log-Pearson Type III distribution was fitted to the nonzero values, and the nonexceedance probabilities were adjusted for the number of zero events. The adjusted probabilities (converted to recurrence intervals) and corresponding discharges were manually plotted on log-normal probability paper to define the final curve (fig. 1). Low-flow discharges were read from the curve for recurrence intervals of 2, 5, 10, and 20 years (see circles on fig. 1).

¹Climatic year is a continuous 12-month period from April 1 to March 31 and is designated by the calendar year in which it ends; and water year is a continuous 12-month period from October 1 to September 30 and is designated by the calendar year in which it ends.

INPUT DATA (ZERO VALUES OMITTED)

13.000	2.500	0.670	6.900	7.000	17.000	1.900	7.300	10.000
7.300	1.900	5.900	1.800	1.190	2.700	8.700	3.800	3.400
12.000	7.500	0.370	6.100	26.000	1.600	1.000	1.300	0.200
1.500	0.300	5.200	13.000	21.000	4.500	4.700	11.000	4.200
10.000	8.100	7.700	5.900	14.000	17.000	17.000	22.000	24.000
11.000	22.000	11.000	29.000	9.500				

MEAN = 8.918
 VARIANCE = 60.912
 STANDARD DEVIATION = 7.805
 SKEWNESS = 1.059
 STANDARD ERROR OF SKEWNESS = 0.319
 SERIAL CORRELATION COEFFICIENT = 0.370
 COEFFICIENT OF VARIATION = 0.875
 MEAN LOGS = 0.728
 VARIANCE LOGS = 0.271
 STANDARD DEVIATION LOGS = 0.521
 SKEWNESS LOGS = -0.849
 STANDARD ERROR OF SKEWNESS LOGS = 0.319
 SERIAL CORRELATION COEFFICIENT LOGS = 0.475
 COEFFICIENT OF VARIATION LOGS = 0.715

NON EXCEED PROB	RECURRENT INTERVAL	PARAMETER VALUE	ADJUSTED PROB
0.0100	100.00	0.160	0.0274
0.0200	50.00	0.275	0.0372
0.0500	20.00	0.582	0.0667
0.1000	10.00	1.075	0.1158
0.2000	5.00	2.111	0.2140
0.5000	2.00	6.319	0.5088
0.8000	1.25	14.894	0.8035
0.9000	1.11	21.376	0.9018
0.9600	1.04	29.596	0.9607
0.9800	1.02	35.421	0.9804
0.9900	1.01	40.853	0.9902

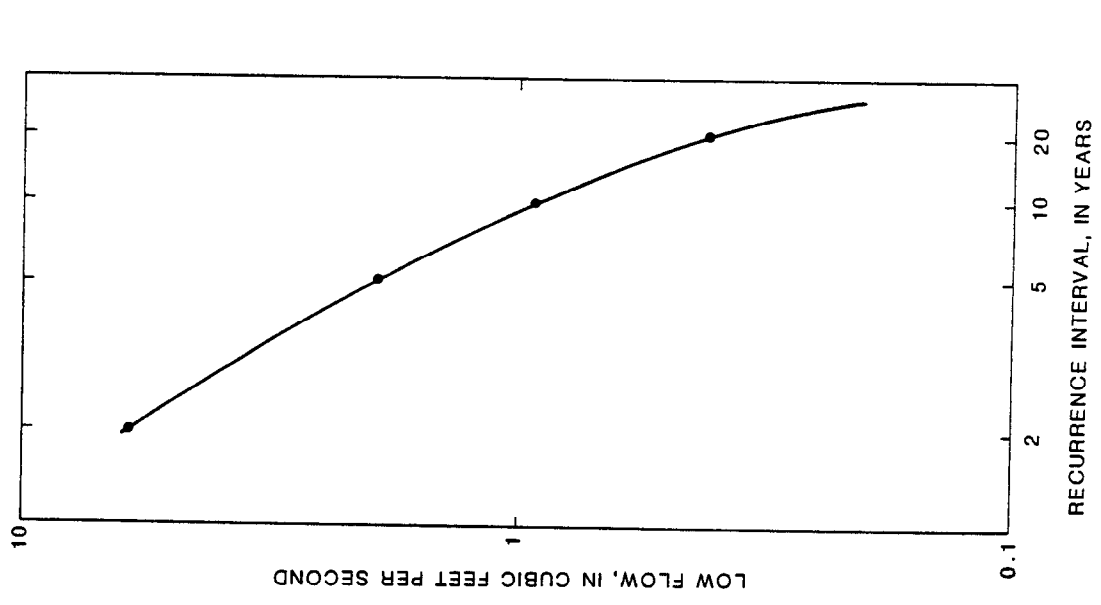


Figure 1.--Three-day low-flow frequency curve, and log-Pearson Type III statistics.

When the data include no zero discharges, the fitted log-Pearson Type III probability distribution and the data points are plotted by computer (fig. 2). Recurrence intervals of the data points were computed by the formula:

$$\text{Recurrence interval} = (n + 1)/m$$

where n is the number of years of record and m is the order number when the annual events are arrayed according to size, the lowest being number 1. Mathematically fitted frequency curves can be generated faster than graphically fitted frequency curves and are adequate for most sets of low-flow data. However, certain low-flow frequency curves cannot be adequately fitted by a three-parameter distribution. For example, a significant difference may exist between the graphical and mathematically-fitted curves for some gages (fig. 2). According to Riggs (1972), the graphically fitted curve should be considered the basic frequency curve for annual low flows. For this report, the graphically fitted curve was used to determine low-flow discharges when the log-Pearson Type III curve did not fit the data.

The reliability of a low-flow frequency curve is closely related to the length of record used in its computation. A period of record representative of long-term flow conditions is desirable; however, the representativeness of the available record used to determine a low-flow frequency curve is generally unknown. For this report, low-flow characteristics at sites having less than 10 years of record were estimated by correlating their daily flows with those of other continuous-record gages having more than 10 years of record. The method used is described in the next section.

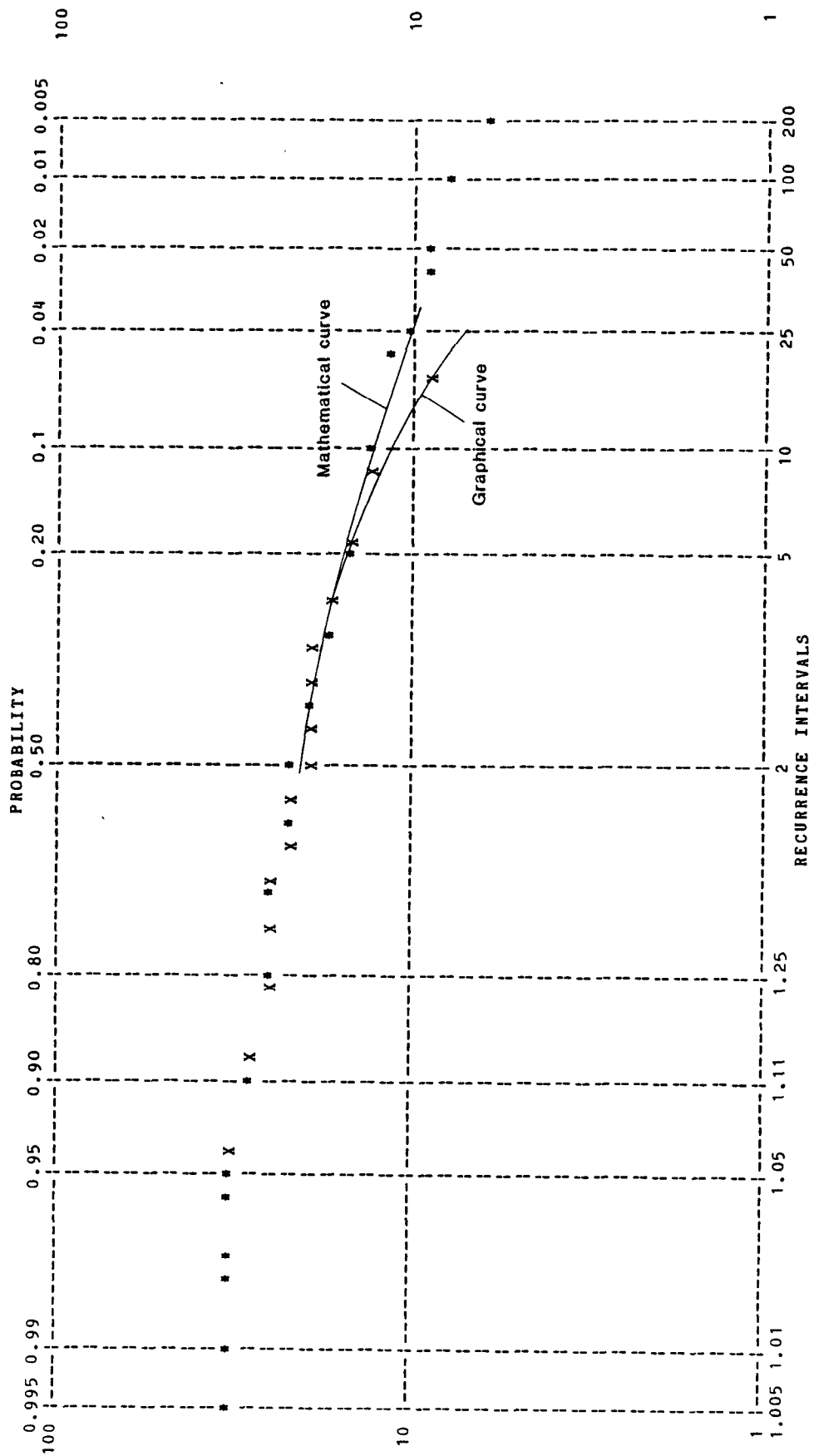
Low Flow at Partial-Record Stations

A low-flow partial-record station is a site where several base-flow discharge measurements have been made. These discharges are correlated with concurrent daily mean discharges at a continuous-record station (fig. 3). The discharges for selected recurrence intervals for the partial-record site are estimated from the correlation curve using discharges for corresponding recurrence intervals from the continuous-record gage. The continuous-record gage must be on a perennial stream, should be near the partial-record station, should be in a similar geologic setting, and should have about the same size drainage area. Those criteria were applied to estimating low flows for partial-record stations in this report. Low-flow estimates were made for 769 partial-record sites in Tennessee.

The first organized low-flow network consisting of partial-record stations was established in the 1950's. The network has been continually revised as adequate measurements were collected at some sites for correlation and as low-flow information was required for other sites.

Reliability of Results

The low-flow characteristics are presented in table 1. They are subject to error, the magnitude of which cannot be determined specifically. The errors



THE FOLLOWING SYMBOLS MAY APPEAR IN THE PLOT
 X - AN INPUT DATA VALUE
 * - A CALCULATED VALUE
 O - A CALCULATED VALUE AND ONE DATA VALUE AT SAME POSITION
 2 - TWO INPUT DATA VALUES PLOTTED AT SAME POSITION
 3 - THREE INPUT DATA VALUES PLOTTED AT SAME POSITION
 A - A CALCULATED VALUE AND TWO DATA VALUES AT SAME POSITION
 B - A CALCULATED VALUE AND THREE DATA VALUES AT SAME POSITION

Figure 2.--Mathematical and graphical low-flow frequency curves.

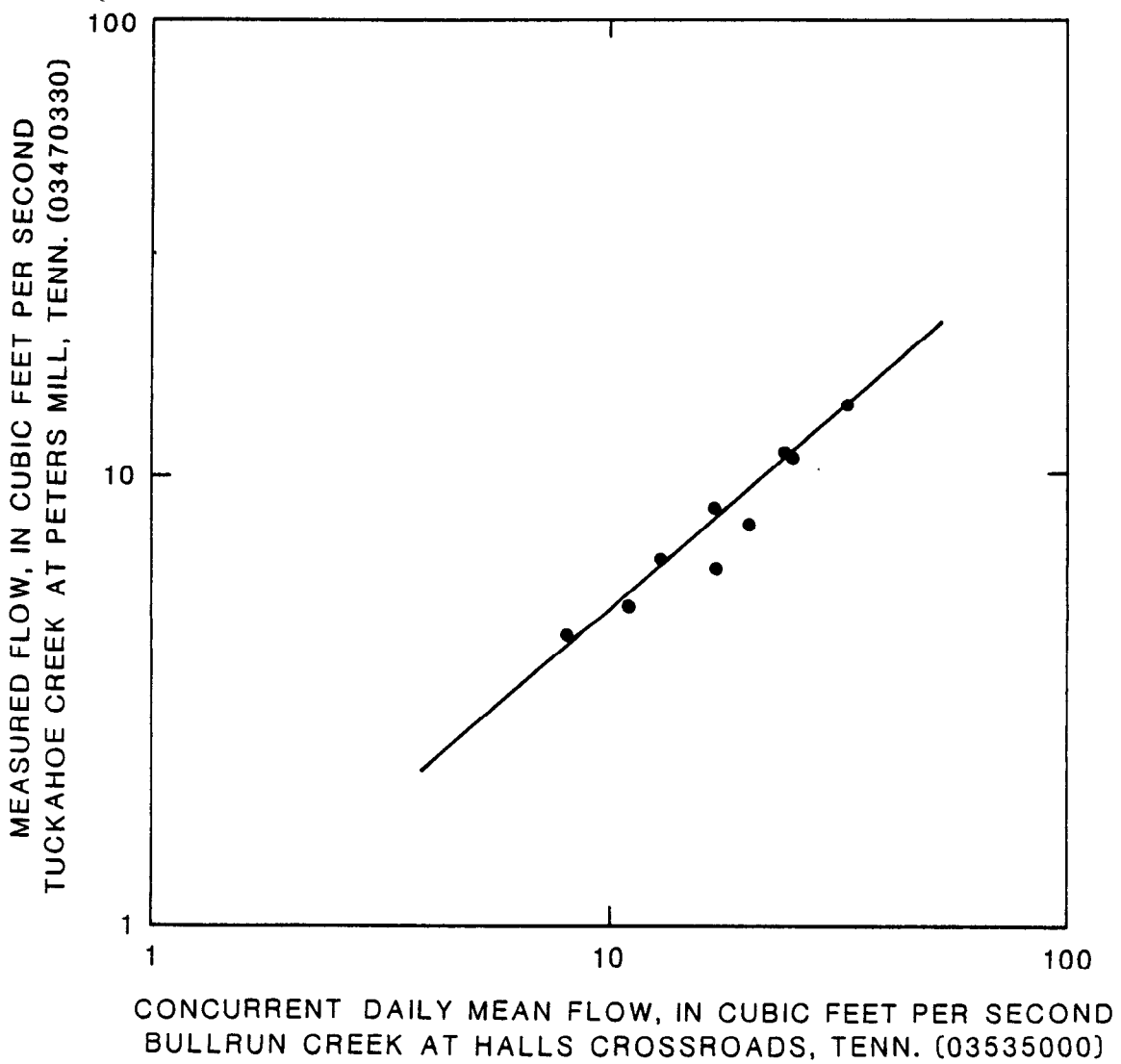


Figure 3.--Correlation of discharge between continuous-record gage (03535000) and partial-record gage (03470330).

are associated with many factors related to time, effects of changes in streamflow caused by activities of man, and representativeness of the period of record to long-term streamflow conditions. For example, streamflow records at some gages might represent dry periods, whereas the streamflow records at other gages might represent wet periods. The low-flow characteristics presented in this report for continuous-record stations with less than 20 years of data will probably change as additional streamflow measurements are collected, and as hydrologic relations are better understood.

The number of significant figures in low-flow discharges in table 1 is based on the length of record and adjustments in the frequency curves. For records of 20 years or more, the low flows are given to three significant figures except for flows of less than 1 ft³/s for which only two are given. For records of less than 20 years, the low flows are given to two significant figures, but not more than one where the low flow is less than 1 ft³/s. For gages where adjustments in frequency curves were made for zero flow and for differences between graphical and mathematically-fitted curves, the low flows are given to two significant figures except when the low flows are less than 1 ft³/s, which are rounded to one significant figure.

Low flows for most of the partial-record gages, shown in table 2, were taken from the report by Gold (1981).

Flow Duration at Continuous-Record Gages

A flow duration curve is a cumulative distribution of daily discharges arranged to show percentage of time specific flows were equaled or exceeded during the period of record. Flow duration data are used for studying flow characteristics of a stream and for comparing hydrologic characteristics of different drainage basins. The flow duration data given in table 1 do not represent probabilities and should not be used for prediction.

The discharges and the corresponding percentages of exceedance given in table 1 were computed from daily discharges for the period of record (complete years). This information was derived for continuous-record stations having at least 5 years of discharge data; adjustments in the discharges were not made to a specific period of time. A summary of flow duration for Sycamore Creek near Ashland City is shown in figure 4. The daily discharges are arranged in 34 class intervals. These intervals represent ranges in discharge which can be identified from the VALUE column in figure 4. Discharge given in the VALUE column is the lower limit for each class interval. The number in the TOTAL column is the number of days during the period of record that the flow equaled or exceeded VALUE. The ACCUM column shows the cumulative number of days in the period of record in which the flow equaled or exceeded VALUE, and the PERCT column shows the percent of time the listed discharge was equaled or exceeded during the period of record.

Percentages and discharges given in the flow duration tables in this report were interpolated mathematically from computer printouts for each station. For example, the discharge of 74 ft³/s at 40 percent of the time for Sycamore Creek near Ashland City (p. 51) was interpolated from information

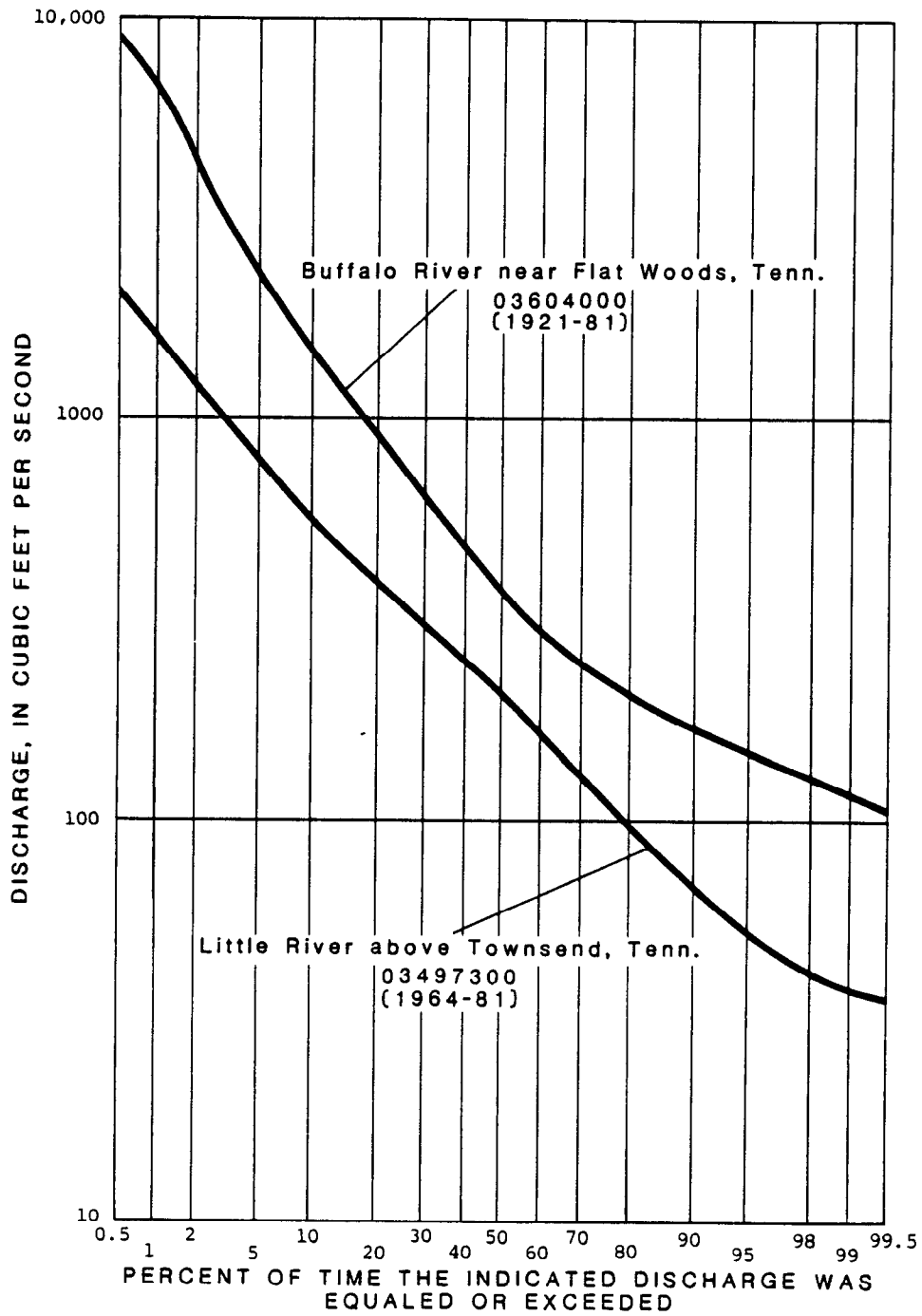


Figure 5.--Flow-duration curves for selected streams (plotted from data given in table 1).

in figure 4. Data in the tables can be used to plot a flow duration curve for each continuous-record gaging station. Figure 5 illustrates flow-duration curves for 2 selected streams plotted from data given in table 1.

SUMMARY

Low-flow frequency characteristics are essential in hydrologic studies to determine optimum development and utilization of streams. For example, the 3-day, 20-year low flow is commonly used in Tennessee as the design flow for water dependent projects. This report provides the 3-day, 20-year low flow for numerous sites across the State. Low-flows for 1, 3, 7, 14, 30, 60, and 90 consecutive days for recurrence intervals of 2, 5, 10, and 20 years are tabulated for continuous-record gages. The low flows were derived by log-Pearson Type III analyses of daily streamflow records. Low flows for partial-record gages for 1, 3, and 7 consecutive days for a 10-year recurrence interval, and 3 consecutive days for a 20-year recurrence interval were estimated by correlating partial-record discharge measurements with concurrent discharges for continuous-record gages.

Flow-duration data were derived from daily discharges for continuous-record stations by computer programs. Flow duration shows the percent of time specific discharges were equaled or exceeded during the period of record. Flow duration is useful for studying flow characteristics of a stream and for comparing hydrologic characteristics of different drainage basins.

REFERENCES CITED

- Eaton, W. R., 1958, Summary of flow duration and low flow at stream-gaging stations in Tennessee: U.S. Geological Survey open-file report, 137 p.
- Gold, R. L., 1981, Low-flow frequency and flow duration of Tennessee streams: U.S. Geological Survey Open-File Report 78-807, 361 p.
- May, V. J., Wood, G. H., and Rima, D. R., 1970, A proposed streamflow-data program for Tennessee: U.S. Geological Survey open-file report, 108 p.
- Riggs, H. C., 1972, Low-flow investigations: U.S. Geological Survey Techniques of Water Resources Investigations, Book 4, Chapter B1, 18 p.
- U.S. Water Resources Council, 1981, Guidelines for determining flood flow frequency: Washington, D. C., U.S. Water Resources Council Bulletin 17B, 183 p.
- Wood, G. H., and Johnson, A. M. F., 1965, Flow characteristics of Tennessee streams, part A, Summaries of flow duration and of low and high flows at gaging stations in Tennessee: Tennessee Division of Water Resources, 326 p.

Table 1.--Low flow and flow duration data
for continuous-record stations

03408000 - NEW RIVER NEAR NEW RIVER, TN

LOCATION.--Lat 36°23'03", long 84°31'43", Scott County, at county highway bridge 1.1 miles east of town of New River, 1.6 miles upstream from Brimstone Creek, and at mile 11.9.

DRAINAGE AREA.--314 mi².

PERIOD OF RECORD.--1923-34.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1.30	80	26.0	20	790
99.1	1.58	70	62.0	10	1,400
99	1.65	60	126	5	2,400
98	2.20	50	219	2	4,400
95	4.60	40	345	1	6,800
90	9.20	30	500	0.5	9,300

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	2.0	0.7	0.4	0.2
3	2.4	.8	.4	.3
7	2.8	1.2	.8	.6
14	3.7	1.8	1.3	1.0
30	6.6	2.9	2.1	1.6
60	17	6.2	3.9	2.8
90	30	11	6.2	4.0

03408500 - NEW RIVER AT NEW RIVER, TN

LOCATION.--Lat 36°23'08", long 84°33'17", Scott County, on left bank at town of New River, 700 feet downstream from Phillips Creek, 1,000 feet downstream from bridge on U.S. Highway 27, 1.7 miles downstream from Brimstone Creek, and at mile 8.6.

DRAINAGE AREA.--382 mi².

PERIOD OF RECORD.--1936-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.50	80	40.3	20	961
99.1	.77	70	78	10	1,700
99	.85	60	139	5	3,020
98	1.80	50	250	2	5,230
95	6.0	40	408	1	7,920
90	16.0	30	620	0.5	11,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	3.63	0.83	0.35	0.16
3	3.98	.91	.39	.18
7	4.91	1.12	.47	.21
14	6.82	1.58	.66	.30
30	13.3	3.46	1.52	.73
60	25.9	7.73	3.81	2.03
90	42.0	14.4	7.77	4.53

03409500 - CLEAR FORK NEAR ROBBINS, TN

LOCATION.--Lat 36°23'18", long 84°37'49", Scott County, on right bank 300 feet downstream from Burnt Mill Bridge, 3.3 miles northwest of Robbins, and at mile 3.7.

DRAINAGE AREA.--272 mi².

PERIOD OF RECORD.--1932-71, 1977-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1.7	80	24.9	20	633
99.1	2.5	70	47.0	10	1,200
99	2.6	60	86.3	5	1,850
98	3.6	50	160	2	3,240
95	6.0	40	257	1	4,850
90	11.0	30	400	0.5	6,900

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	4.41	1.90	1.14	0.73
3	4.54	1.98	1.22	.80
7	4.96	2.25	1.45	1.00
14	6.10	2.85	1.88	1.32
30	9.46	4.53	3.07	2.23
60	15.9	7.83	5.44	4.05
90	26.0	11.9	7.81	5.48

03414500 - EAST FORK OBEY RIVER NEAR JAMESTOWN, TN

LOCATION.--Lat 36°24'58", long 85°01'35", Fentress County, on right bank
 200 feet upstream from bridge on State Highway 52, 0.5 mile upstream from
 Poplar Cove Creek, 5.3 miles west of Jamestown, and 12.8 miles upstream
 from confluence with West Fork.

DRAINAGE AREA.--202 mi².

PERIOD OF RECORD.--1944-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage
 of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	5.0	80	25	20	554
99.1	5.6	70	45	10	970
99	5.8	60	87	5	1,580
98	6.9	50	160	2	2,700
95	9.8	40	254	1	4,000
90	15	30	376	0.5	5,600

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	8.90	5.73	4.60	3.84
3	9.06	5.87	4.74	4.00
7	9.68	6.23	5.01	4.22
14	10.9	6.78	5.36	4.45
30	13.3	8.06	6.48	5.52
60	19.2	10.5	8.00	6.54
90	27.2	13.6	9.81	7.64

03415000 - WEST FORK OBEY RIVER NEAR ALPINE, TN

LOCATION.--Lat 36°23'49", long 85°10'28", Overton County, on upstream end of left pier of bridge on State Highway 52, 0.3 mile upstream from Nettlecarrier Creek, 2.4 miles east of Alpine, and 7.8 miles upstream from confluence with East Fork.

DRAINAGE AREA.--114 mi² (includes 34 mi² without surface drainage).

PERIOD OF RECORD.--1944-71, 1981.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	3.3	80	10	20	208
99.1	3.5	70	16	10	370
99	3.5	60	27	5	603
98	3.9	50	47	2	1,120
95	4.9	40	80	1	1,700
90	6.3	30	132	0.5	2,330

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	4.17	3.18	2.86	2.67
3	4.28	3.27	2.94	2.74
7	4.48	3.41	3.08	2.90
14	5.00	3.77	3.37	3.13
30	5.96	4.50	4.10	3.88
60	8.24	5.42	4.55	4.02
90	10.6	6.56	5.32	4.56

03415500 - OBEY RIVER NEAR BYRDSTOWN, TN

LOCATION.--Lat 36°32'09", long 85°10'13", Pickett County, at former bridge on State Highway 42, 0.4 mile downstream from present bridge, 1.8 miles upstream from Big Eagle Creek, and 3.2 miles southwest of Byrdstown.

DRAINAGE AREA.--445 mi².

PERIOD OF RECORD.--1919-43.

REMARKS.--Site now inundated by Dale Hollow Reservoir.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	13.1	80	61.0	20	966
99.1	15.2	70	101	10	1,680
99	15.4	60	174	5	2,800
98	17.4	50	294	2	5,100
95	23.4	40	447	1	7,300
90	34.3	30	649	0.5	9,910

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	18.5	11.5	9.88	8.00
3	21.4	14.0	12.0	10.3
7	23.6	15.0	14.0	11.8
14	26.7	17.5	15.1	12.9
30	32.8	20.0	17.1	14.6
60	46.3	28.5	22.6	18.8
90	71.3	32.0	23.0	21.6

03416000 - WOLF RIVER NEAR BYRDSTOWN, TN

LOCATION.--Lat 36°33'37", long 85°04'23", Pickett County, on right bank 0.3 mile upstream from bridge on county road, 0.5 mile upstream from Widow Creek, 1.6 miles north of Moodyville, 3.2 miles east of Byrdstown, and 5.4 miles upstream from Lick Creek.

DRAINAGE AREA.--106 mi².

PERIOD OF RECORD.--1944-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	5.5	80	19	20	247
99.1	5.8	70	27	10	430
99	6.0	60	44	5	677
98	6.8	50	72	2	1,240
95	8.9	40	112	1	1,900
90	12	30	163	0.5	2,600

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	7.96	5.07	3.97	3.23
3	8.23	5.40	4.32	3.58
7	8.70	6.15	5.19	4.55
14	9.51	6.83	5.84	5.18
30	11.5	8.06	6.83	6.02
60	14.3	9.67	8.10	7.10
90	18.2	11.7	9.50	8.07

03417000 - OBEY RIVER BELOW DALE HOLLOW DAM, TN

LOCATION.--Lat 36°32'12", long 85°27'22", Clay County, on right bank 1,200 feet downstream from Dale Hollow Dam, 3 miles east of Celina, 7.1 miles upstream from mouth, and 24 miles downstream from Wolf River.

DRAINAGE AREA.--935 mi².

PERIOD OF RECORD.--1944-58.

REMARKS.--Flow completely regulated by Dale Hollow Reservoir (since August 1943).

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0	80	0	20	2,960
99.1	0	70	0	10	4,000
99	0	60	343	5	5,000
98	0	50	966	2	6,120
95	0	40	1,480	1	6,700
90	0	30	2,160	0.5	7,390

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0	0	0	0
3	0	0	0	0
7	0	0	0	0
14				
30				
60				
90				

03417500 - CUMBERLAND RIVER AT CELINA, TN

LOCATION.--Lat 36°33'20", long 85°30'47", Clay County, on right pier of bridge on State Highway 52 at Celina, 600 feet downstream from Obey River and at mile 380.8.

DRAINAGE AREA.--7,307 mi².

PERIOD OF RECORD.--

REMARKS.--Flow regulated. Flow data from U.S. Army Corps of Engineers, 1980, Nashville District.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	700	80	5,000	20	19,000
99.1	900	70	6,500	10	27,000
99	1,000	60	8,000	5	32,000
98	1,400	50	9,800	2	41,000
95	2,400	40	11,000	1	47,000
90	3,300	30	14,000	0.5	50,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	760	415	300	225
3	1,290	680	475	350
7	2,050	1,190	850	640
14	3,300	2,400	2,100	1,850
30	3,800	3,100	2,850	2,700
60				
90				

03418000 - ROARING RIVER NEAR HILHAM, TN

LOCATION.--Lat 36°20'27", long 85°25'35", Overton County, on left bank 700 feet upstream from Cleek Branch, 0.2 mile downstream from bridge on State Highway 136, 1.4 miles upstream from Flat Creek, 2.7 miles west of Windle, 5.0 miles south of Hilham, and 13 miles north of courthouse in Cookeville.

DRAINAGE AREA.--78.7 mi² (includes 27.1 mi² without surface drainage).

PERIOD OF RECORD.--1933-75.

REMARKS.--Discharge affected occasionally by change in storage in a water-supply reservoir on Carr Creek since 1964.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	3.40	80	13.1	20	145
99.1	3.97	70	19.2	10	250
99	4.04	60	28.0	5	400
98	4.81	50	42.0	2	735
95	6.30	40	62.6	1	1,070
90	8.50	30	92.7	0.5	1,600

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	5.7	4.1	3.5	3.1
3	6.2	4.5	3.8	3.3
7	6.6	4.7	3.9	3.4
14	7.2	5.0	4.2	3.6
30	8.7	5.8	4.7	3.9
60	11	7.1	5.6	4.7
90	14	8.4	6.6	5.3

03418500 - CANEY FORK AT CLIFTY, TN

LOCATION.--Lat 35°53'28", long 85°13'05", Cumberland County, on right bank, 50 feet downstream from county highway bridge, 200 feet upstream from Pilot Falls, 0.6 mile south of Clifty, and 3 miles upstream from Clifty Creek.

DRAINAGE AREA.--111 mi².

PERIOD OF RECORD.--1930-49.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.10	80	4.77	20	292
99.1	.12	70	13.0	10	530
99	.13	60	29.0	5	861
98	.19	50	65.1	2	1,510
95	.49	40	110	1	2,230
90	1.23	30	180	0.5	3,010

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0.29	0.06	0	0
3	.34	.07	0	0
7	.43	.09	.08	0
14	.51	.15	.09	.08
30	.84	.25	.14	.10
60	1.69	.54	.31	.20
90	4.50	1.54	.88	.55

03419000 - BEE CREEK AT HERBERT, TN

LOCATION.--Lat 35°45'46", long 85°15'10", Bledsoe County, 500 feet downstream from Glade Creek and 0.75 mile northwest of Herbert.

DRAINAGE AREA.--101 mi².

PERIOD OF RECORD.--1930-37.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0	80	4.17	20	259
99.1	0	70	12.1	10	473
99	0	60	26.9	5	761
98	0	50	55.5	2	1,470
95	.05	40	95.4	1	2,540
90	.86	30	159	0.5	3,400

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0	0	0	0
3	0	0	0	0
7	0	0	0	0
14				
30				
60				
90				

03420000 - CALFKILLER RIVER BELOW SPARTA, TN

LOCATION.--Lat 35°54'31", long 85°28'46", White County, on right bank 0.7 mile downstream from abandoned hydroelectric power plant of Tennessee Valley Authority, 1.5 miles southwest of Sparta, and at mile 11.5.

DRAINAGE AREA.--175 mi² (includes 64 mi² without surface drainage).

PERIOD OF RECORD.--1940-71.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	16.4	80	47.4	20	503
99.1	18.3	70	67.4	10	866
99	18.6	60	96.8	5	1,360
98	21.0	50	149	2	2,320
95	25.2	40	227	1	3,170
90	31.3	30	335	0.5	4,310

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	25.2	18.2	15.4	13.5
3	25.5	18.7	16.0	14.2
7	26.6	19.7	17.2	15.4
14	28.0	20.7	18.0	16.1
30	30.7	22.4	19.5	17.7
60	38.6	25.9	21.7	19.1
90	45.9	29.3	23.9	20.6

03420500 - BARREN FORK NEAR TROUSDALE, TN

LOCATION.--Lat 35°39'55", long 85°53'00", Warren County, on left bank 15 feet downstream from highway bridge on Trousdale-McMinnville pike, 3.25 miles east of Trousdale, 4.5 miles downstream from Bullpen Creek, 6 miles west of McMinnville, 6.2 miles upstream from Hickory Creek, and at mile 16.6.

DRAINAGE AREA.--126 mi².

PERIOD OF RECORD.--1932-57.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	34.4	80	57.1	20	247
99.1	36.4	70	65.9	10	403
99	36.9	60	77.7	5	676
98	40.0	50	97.6	2	1,340
95	45.2	40	128	1	2,100
90	49.1	30	177	0.5	3,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	44.6	38.9	36.1	33.8
3	45.3	39.5	36.7	34.4
7	45.7	39.9	37.1	34.8
14	47.1	41.1	38.2	35.9
30	49.6	42.9	39.5	36.7
60	53.1	45.2	41.6	38.9
90	56.9	48.0	44.2	41.3

03421000 - COLLINS RIVER NEAR McMINNVILLE, TN

LOCATION.--Lat 35°42'32", long 85°43'46", Warren County, on left bank 10 feet downstream from bridge on U.S. Highway 70S, 1.75 miles downstream from Barren Fork, 2.5 miles northeast of McMinnville, and at mile 19.3.

DRAINAGE AREA.--642 mi².

PERIOD OF RECORD.--1926-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	60	80	157	20	1,580
99.1	65	70	220	10	2,620
99	67	60	328	5	4,150
98	75	50	510	2	7,220
95	91	40	752	1	10,200
90	110	30	1,070	0.5	14,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	84.8	63.5	54.1	47.2
3	88.5	66.8	57.0	49.8
7	92.5	72.4	63.8	57.5
14	98.6	77.6	68.8	62.5
30	108	83.4	74.0	67.5
60	132	93.7	80.3	71.5
90	164	112	93.0	80.9

03421500 - COLLINS RIVER NEAR ROWLAND, TN

LOCATION.--Lat 35°46'39", long 85°41'40", Warren County, at Hennessee bridge
 1 mile downstream from Mountain Creek, 2.5 miles northwest of Rowland, 5
 miles southwest of Rock Island, and at mile 7.5.

DRAINAGE AREA.--755 mi².

PERIOD OF RECORD.--1916-24.

REMARKS.--Site now inundated by Great Falls Lake.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage
 of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	96.0	80	277	20	2,020
99.1	104	70	421	10	3,300
99	106	60	601	5	5,110
98	119	50	845	2	8,530
95	149	40	1,120	1	12,000
90	185	30	1,460	0.5	17,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	120	77	62	50
3	130	88	72	59
7	145	97	80	68
14				
30				
60				
90				

03422500 - CANEY FORK NEAR ROCK ISLAND, TN

LOCATION.--Lat 35°48'26", long 85°37'44", Warren County, on right bank
 180 feet downstream from powerhouse of Tennessee Valley Authority, 0.5
 mile downstream from dam at mouth of Collins River, 1 mile northwest of
 Rock Island, 64 miles upstream from Center Hill Dam, and at mile 90.3.

DRAINAGE AREA.--1,678 mi².

PERIOD OF RECORD.--1913-81.

REMARKS.--Flow regulated by Great Falls Lake.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage
 of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	36	80	380	20	3,960
99.1	39	70	690	10	6,700
99	40	60	1,130	5	10,900
98	46	50	1,800	2	19,200
95	60	40	2,650	1	27,300
90	160	30	3,150	0.5	34,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	58.6	36.4	29.9	26.2
3	86.6	49.2	37.7	30.7
7	146	79.9	57.4	43.5
14	199	112	79.8	59.5
30	274	151	105	76.5
60	387	212	149	108
90	473	273	203	158

03423000 - FALLING WATER RIVER NEAR COOKEVILLE, TN

LOCATION.--Lat 36°04'38", long 85°31'17", Putnam County, on left bank at old Burgess Mill site, 0.6 mile upstream from Post Oak Creek and 6.0 miles south of the courthouse in Cookeville.

DRAINAGE AREA.--67.0 mi² (includes 21.1 mi² without surface drainage).

PERIOD OF RECORD.--1932-52.

REMARKS.--Low flow affected by storage in Cookeville City Lake. Some diurnal fluctuation at low flow caused by Burgess Mill prior to 1953.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1.99	80	10.3	20	134
99.1	2.45	70	16.5	10	250
99	2.58	60	26.1	5	432
98	3.36	50	39.2	2	790
95	4.87	40	59.7	1	1,160
90	6.47	30	89.7	0.5	1,600

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	4.58	2.83	2.14	1.68
3	4.61	3.06	2.48	2.09
7	5.06	3.40	2.76	2.32
14	5.68	3.79	3.05	2.54
30	6.84	4.53	3.56	2.88
60	8.53	5.31	4.05	3.20
90	11.1	6.65	4.50	3.50

03424500 - CANEY FORK BELOW CENTER HILL DAM NEAR LANCASTER, TN

LOCATION.--Lat 36°06'10", long 85°50'40", Smith County, on left bank 1.1 miles downstream from Center Hill Dam, 2 miles south of Lancaster, 4.7 miles upstream from Indian Creek, 10 miles north of Smithville, and at mile 25.5.

DRAINAGE AREA.--2,183 mi².

PERIOD OF RECORD.--1922-58.

REMARKS.--Flow regulated by Great Falls Lake (for period of record) and by Center Hill Reservoir (since October 1948).

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	32.3	80	510	20	5,460
99.1	38.2	70	900	10	9,170
99	39.5	60	1,350	5	12,700
98	50.0	50	2,020	2	20,800
95	78.1	40	2,930	1	28,100
90	215	30	3,830	0.5	35,700

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	170	38	27	20
3	190	47	33	30
7	220	80	40	31
14	272	140	52	39
30	360	200	82	51
60	523	265	164	103
90	720	350	210	130

03425000 - CUMBERLAND RIVER AT CARTHAGE, TN

LOCATION.--Lat 36°14'53", long 85°57'19", Smith County, on left pier of Cordell Hull Bridge on State Highway 25, at Carthage, 1.0 mile downstream from Caney Fork at mile 308.2.

DRAINAGE AREA.--10,690 mi².

PERIOD OF RECORD.--1922-43.

REMARKS.--Flow regulated by Great Falls Lake (for period of record). For regulated flow characteristics, see next page.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	495	80	2,080	20	24,500
99.1	547	70	3,330	10	43,000
99	554	60	5,280	5	65,000
98	633	50	7,940	2	98,300
95	801	40	11,900	1	122,000
90	1,120	30	16,700	0.5	134,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	640	475	417	379
3	678	501	440	400
7	752	549	478	431
14	845	601	514	458
30	1,000	700	615	534
60	1,470	840	720	625
90	2,000	1,100	900	770

03425000 - CUMBERLAND RIVER AT CARTHAGE, TN

LOCATION.--Lat 36°14'53", long 85°57'19", Smith County, on left pier of Cordell Hull Bridge on State Highway 25, at Carthage, 1.0 mile downstream from Caney Fork at mile 308.2.

DRAINAGE AREA.--10,690 mi².

PERIOD OF RECORD.--

REMARKS.--Flow regulated. Flow data from U.S. Army Corps of Engineers, 1980, Nashville District.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	2,000	80	7,200	20	28,000
99.1	2,200	70	9,100	10	40,000
99	2,300	60	11,000	5	51,000
98	3,000	50	14,000	2	67,000
95	4,000	40	18,000	1	73,000
90	5,300	30	21,000	0.5	80,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	2,400	1,470	1,100	920
3	3,100	2,100	1,700	1,430
7	4,000	2,800	2,300	1,970
14	4,600	3,400	2,900	2,600
30	5,400	4,300	3,900	3,700
60				
90				

03425500 - SPRING CREEK NEAR LEBANON, TN

LOCATION.--Lat 36°10'49", long 86°14'29", Wilson County, on downstream end of middle pier of bridge on Eastover Road, 0.6 mile downstream from Black Branch, and 3.4 miles southeast of the square in Lebanon.

DRAINAGE AREA.--35.3 mi².

PERIOD OF RECORD.--1954-61.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0	80	0.78	20	59.1
99.1	0	70	2.65	10	133
99	0	60	6.73	5	253
98	0	50	13.5	2	587
95	.02	40	23.1	1	810
90	.16	30	36.9	0.5	1,120

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0	0	0	0
3	0	0	0	0
7	0	0	0	0
14				
30				
60				
90				

03426000 - DRAKES CREEK ABOVE HENDERSONVILLE, TN

LOCATION.--Lat 36°22'14", long 86°37'00", Sumner County, on downstream wing-wall of left abutment of former Long Hollow Pike bridge, at Shackle Island, 2 miles downstream from Hogan Branch and 4.5 miles north of Hendersonville.

DRAINAGE AREA.--19.2 mi².

PERIOD OF RECORD.--1954-61.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.03	80	0.91	20	31.0
99.1	.03	70	1.75	10	50.8
99	.03	60	3.29	5	84.0
98	.05	50	5.34	2	188
95	.21	40	11.4	1	320
90	.38	30	18.8	0.5	450

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0	0	0	0
3	0	0	0	0
7	0	0	0	0
14				
30				
60				
90				

03426500 - CUMBERLAND RIVER BELOW OLD HICKORY, TN

LOCATION.--Lat 36°15'39", long 86°40'30", Davidson County, on downstream end of left pier of bridge on State Highway 45, 1.5 miles west of Old Hickory, 2.1 miles east of Madison, 3.3 miles downstream from Mansker Creek, 4.1 miles downstream from Old Hickory Dam, and at mile 212.1.

DRAINAGE AREA.--11,736 mi².

PERIOD OF RECORD.--

REMARKS.--Flow regulated. Flow data from U.S. Army Corps of Engineers, 1980, Nashville District.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1,500	80	7,700	20	29,000
99.1	2,100	70	9,700	10	41,000
99	2,400	60	12,000	5	52,000
98	3,000	50	15,000	2	72,000
95	4,300	40	18,000	1	83,000
90	5,600	30	23,000	0.5	94,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	2,500	1,600	1,300	1,100
3	3,400	2,200	1,760	1,500
7	4,100	3,000	2,400	2,100
14	4,800	3,700	3,200	2,900
30	5,600	4,600	4,300	4,000
60				
90				

03426800 - EAST FORK STONES RIVER AT WOODBURY, TN

LOCATION.--Lat 36°49'41", long 86°04'36", Cannon County, on center pier on downstream side of bridge on U.S. Highway 70S, at Woodbury, 0.4 mile downstream from Doolittle Branch, and at mile 45.6.

DRAINAGE AREA.--39.1 mi².

PERIOD OF RECORD.--1964-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	4.3	80	12	20	81
99.1	4.8	70	16	10	140
99	5.5	60	21	5	225
98	5.8	50	28	2	414
95	7.2	40	38	1	638
90	8.5	30	55	0.5	1,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	7.2	5.2	4.3	3.6
3	7.6	5.6	4.6	3.8
7	7.8	5.9	4.9	4.2
14	8.4	6.3	5.3	4.5
30	9.5	6.8	5.6	4.7
60	11	7.9	6.6	5.6
90	13	8.7	7.1	6.1

03427000 - BRADLEY CREEK AT LASCASSAS, TN

LOCATION.--Lat 35°55'39", long 86°17'25", Rutherford County, on downstream end of county road bridge pier near midstream, 900 feet south of Lascassas, 0.4 mile downstream from Jarman Branch, 2.0 miles upstream from mouth, and 8.0 miles northeast of the courthouse in Murfreesboro.

DRAINAGE AREA.--37.0 mi².

PERIOD OF RECORD.--1954-61.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.02	80	0.94	20	61.5
99.1	.02	70	2.81	10	127
99	.02	60	6.26	5	251
98	.03	50	12.4	2	622
95	.08	40	22.4	1	993
90	.24	30	36.9	0.5	1,290

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0	0	0	0
3	0	0	0	0
7	0	0	0	0
14				
30				
60				
90				

03427500 - EAST FORK STONES RIVER NEAR LASCASSAS, TN

LOCATION.--Lat 35°55'06", long 86°20'02", Rutherford County, on left bank, 100 feet upstream from highway bridge, 2.5 miles southwest of Lascassas, 3.7 miles downstream from Bradley Creek, 6.0 miles northeast of the courthouse in Murfreesboro, and at mile 15.4.

DRAINAGE AREA.--262 mi².

PERIOD OF RECORD.--1952-58, 1965-81.

REMARKS.--Frequent diurnal fluctuations at low flow caused by small mills above station.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	4.2	80	29	20	512
99.1	5.2	70	46	10	990
99	5.5	60	73	5	1,790
98	7.4	50	120	2	3,790
95	11	40	193	1	6,100
90	16	30	311	0.5	8,330

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	8.72	3.96	2.26	1.31
3	9.11	5.25	3.85	2.95
7	11.2	6.81	5.15	4.05
14	13.2	7.80	5.86	4.60
30	16.6	10.0	7.67	6.17
60	23.6	13.5	10.4	8.46
90	35.7	19.4	14.4	11.4

03428000 - WEST FORK STONES RIVER NEAR MURFREESBORO, TN

LOCATION.--Lat 35°49'20", long 86°25'03", Rutherford County, on downstream end of second pier from right abutment of bridge on State Highway 99, 0.8 mile downstream from Middle Fork and 2.2 miles southwest of the courthouse in Murfreesboro.

DRAINAGE AREA.--128 mi² (includes 3 mi² without surface drainage).

PERIOD OF RECORD.--1932-69.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.49	80	6.93	20	230
99.1	.63	70	14.1	10	469
99	.65	60	26.0	5	800
98	.85	50	48.6	2	1,670
95	1.49	40	81.0	1	2,760
90	2.82	30	130	0.5	3,940

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	1.10	0.49	0.29	0.13
3	1.18	.58	.38	.18
7	1.36	.62	.44	.22
14	1.64	.64	.54	.37
30	2.00	.94	.63	.46
60	4.52	1.71	1.04	.68
90	9.80	3.50	2.40	1.60

03428500 - WEST FORK STONES RIVER NEAR SMYRNA, TN

LOCATION.--Lat 35°56'25", long 86°27'54", Rutherford County, near right bank, at county bridge on Sulphur Springs Road, 400 feet upstream from Nice's Mill dam, 1.6 miles downstream from Overall Creek, 4.2 miles southeast of Smyrna, and at mile 6.4.

DRAINAGE AREA.--237 mi² (includes 43 mi² without surface drainage).

PERIOD OF RECORD.--1967-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	7.3	80	39	20	576
99.1	8.7	70	61	10	1,000
99	9.3	60	97	5	1,570
98	13	50	160	2	3,000
95	18	40	228	1	4,480
90	25	30	348	0.5	6,200

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	16	11	7.0	5.0
3	17	12	8.0	6.0
7	18	13	9.0	6.5
14	21	16	12	7.0
30	27	20	14	9.0
60	37	26	16	11
90	55	32	20	16

03429000 - STONES RIVER NEAR SMYRNA, TN

LOCATION.--Lat 35°59'59", long 86°27'35", Rutherford County, on right bank, 30 feet downstream from highway bridge at Jefferson Springs, 1.1 miles north of Old Jefferson, 1.5 miles downstream from confluence of East and West Forks, 3.5 miles northeast of Smyrna, 4.1 miles upstream from Fall Creek, and at mile 37.2.

DRAINAGE AREA.--571 mi².

PERIOD OF RECORD.--1926-67.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	8.80	80	55.0	20	1,150
99.1	10.8	70	92.5	10	2,200
99	11.4	60	161	5	3,820
98	13.8	50	268	2	7,100
95	20.0	40	430	1	10,800
90	29.9	30	680	0.5	14,900

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	14.6	9.78	7.00	6.51
3	16.0	10.8	7.80	7.33
7	17.9	12.2	9.95	8.37
14	20.9	14.0	11.6	9.73
30	27.2	16.9	13.4	11.2
60	46.3	22.0	17.4	13.3
90	73.5	36.0	27.4	20.5

03429500 - STEWART CREEK NEAR SMYRNA, TN

LOCATION.--Lat 35°59'54", long 86°30'18", Rutherford County, on upstream end of right abutment of bridge on Fifteenth Ave., 0.4 mile downstream from Harts Branch, 1.3 miles northeast of Smyrna, and 5.3 miles upstream from mouth.

DRAINAGE AREA.--69.7 mi² (includes 7.6 mi² without surface drainage).

PERIOD OF RECORD.--1952-58.

REMARKS.--Occasional regulation at low flow caused by small dams above station.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0	80	1.50	20	138
99.1	0	70	3.51	10	252
99	0	60	7.25	5	452
98	0	50	19.3	2	896
95	0	40	40.6	1	1,390
90	0.39	30	79.2	0.5	1,840

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0	0	0	0
3	0	0	0	0
7	0	0	0	0
14				
30				
60				
90				

03430100 - STONES RIVER BELOW J. PERCY PRIEST DAM, TN

LOCATION.--Lat 36°09'30", long 86°37'14", Davidson County, on left bank 750 feet upstream from bridge on Interstate Highway 40, 900 feet downstream from J. Percy Priest Dam, 2.4 miles east of Donelson, and at mile 6.6.

DRAINAGE AREA.--892 mi².

PERIOD OF RECORD.--1939-67.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	13.7	80	75.3	20	1,710
99.1	14.7	70	133	10	3,320
99	15.0	60	223	5	5,850
98	17.6	50	400	2	10,400
95	24.3	40	645	1	15,500
90	38.4	30	1,060	0.5	21,200

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	20.0	14.5	12.4	10.9
3	20.7	15.0	12.8	11.2
7	22.6	16.0	13.4	11.7
14	25.0	17.5	14.6	12.6
30	32.0	20.1	16.2	13.7
60	58.1	28.8	20.2	15.2
90	92.6	46.7	32.4	23.9

03431000 - MILL CREEK NEAR ANTIOCH, TN

LOCATION.--Lat 36°04'54", long 86°40'50", Davidson County, at downstream end of center bridge pier on Franklin-Limestone Road, 900 feet upstream from Louisville, & Nashville Railroad spur track bridge, 1.6 miles north of Antioch, 2.1 miles downstream from Whittemore Branch, and 8.2 miles southeast of the State capitol in Nashville.

DRAINAGE AREA.--64.0 mi².

PERIOD OF RECORD.--1953-75.

REMARKS.--Minor diversion from gage pool for industrial use.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0	80	2.35	20	115
99.1	0	70	5.40	10	217
99	0	60	11.6	5	375
98	0	50	22.1	2	792
95	.27	40	40.4	1	1,190
90	.80	30	68.5	0.5	1,680

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0.20	0	0	0
3	.30	0	0	0
7	.40	0	0	0
14	.50	.05	0	0
30	1.50	.46	.10	0
60	3.60	1.00	.25	0
90	6.50	2.50	1.40	.80

03431300 - BROWNS CREEK AT STATE FAIRGROUNDS AT NASHVILLE, TN

LOCATION.--Lat 36°07'47", long 86°45'40", Davidson County, near center span on downstream side of bridge on access road to pit area of the race track at State Fairgrounds, 300 feet west of Craighead Street, 0.3 miles upstream from bridge on U.S. Highways 31A and 41A, and 2.8 miles southeast of the State capitol in Nashville.

DRAINAGE AREA.--11.8 mi².

PERIOD OF RECORD.--1964-75.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.50	80	1.92	20	21.7
99.1	.60	70	2.74	10	39.2
99	.60	60	3.99	5	62.3
98	.66	50	5.79	2	108
95	.88	40	8.72	1	170
90	1.26	30	13.8	0.5	270

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0.7	0.4	0.3	0.2
3	.7	.5	.4	.3
7	.8	.5	.4	.3
14	1.1	.7	.6	.5
30	1.7	1.1	.8	.6
60	2.2	1.4	1.1	.9
90	3.1	1.9	1.4	1.1

03431500 - CUMBERLAND RIVER AT NASHVILLE, TN

LOCATION.--Lat 36°09'45", long 86°46'17", Davidson County, on right bank pier of Shelby Ave. bridge in Nashville, 2.7 miles upstream from former lock and dam 1, 3.3 miles downstream from Mill Creek, and at mile 191.1

DRAINAGE AREA.--12,856 mi², at former lock and dam 1.

PERIOD OF RECORD.--1893-1943.

REMARKS.--Some regulation by Great Falls Lake (since December 1916). Site now inundated by Cheatham Lake.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	602	80	2,670	20	30,400
99.1	679	70	4,090	10	53,300
99	700	60	6,400	5	80,200
98	830	50	9,810	2	109,000
95	1,100	40	14,400	1	126,000
90	1,550	30	20,500	0.5	144,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	1,060	561	362	238
3	1,070	660	522	429
7	1,090	742	614	528
14	1,210	823	683	590
30	1,500	961	770	645
60	1,980	1,200	931	762
90	3,600	1,530	1,180	955

03431500 - CUMBERLAND RIVER AT NASHVILLE, TN

LOCATION.--Lat 36°09'45", long 86°46'17", Davidson County, on right bank pier of Shelby Ave. bridge in Nashville, 2.7 miles upstream from former lock and dam 1, 3.3 miles downstream from Mill Creek, and at mile 191.1.

DRAINAGE AREA.--12,856 mi², at former lock and dam 1.

PERIOD OF RECORD.--

REMARKS.--Flow regulated. Flow data interpolated from information on Cumberland River below Old Hickory (03426500) and below Cheatham Dam (03435000). Information provided by U.S. Army Corps of Engineers, 1980, Nashville District.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1,550	80	8,000	20	32,700
99.1	2,150	70	10,300	10	45,600
99	2,450	60	12,900	5	57,500
98	3,100	50	15,500	2	80,300
95	4,440	40	19,400	1	95,400
90	5,800	30	24,900	0.5	110,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	2,600	1,600	1,300	1,100
3	3,450	2,250	1,780	1,550
7	4,240	3,050	2,500	2,150
14	5,000	3,900	3,400	3,100
30	6,000	4,900	4,600	4,200
60				
90				

03431600 - WHITES CREEK AT TUCKER ROAD NEAR BORDEAUX, TN

LOCATION.--Lat 36°12'45", long 86°49'29", Davidson County, at bridge on Tucker Road, 0.8 mile downstream from Ewing Creek, 1.3 miles north of Bordeaux, and 3.9 miles northwest of the State capitol in Nashville.

DRAINAGE AREA.--51.6 mi².

PERIOD OF RECORD.--1964-75.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.43	80	4.74	20	90.1
99.1	.54	70	8.15	10	174
99	.57	60	14.0	5	317
98	.82	50	21.8	2	577
95	1.48	40	36.1	1	862
90	2.36	30	56.5	0.5	1,250

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	1.0	0.4	0.3	0.2
3	1.1	.4	.4	.3
7	1.3	.5	.4	.3
14	1.6	.7	.5	.4
30	2.4	1.0	.8	.6
60	3.7	2.3	1.8	1.6
90	6.0	3.3	2.5	2.1

03431700 - RICHLAND CREEK AT CHARLOTTE AVE. AT NASHVILLE, TN

LOCATION.--Lat 36°09'04", long 86°51'16", Davidson County, at Charlotte Avenue bridge on U.S. Highway 70, 3.7 miles upstream from mouth, and 4.0 miles southwest of the State capitol in Nashville.

DRAINAGE AREA.--24.3 mi².

PERIOD OF RECORD.--1965-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.3	80	2.4	20	43
99.1	.3	70	4.1	10	84
99	.3	60	6.5	5	142
98	.5	50	11	2	263
95	.9	40	16	1	413
90	1.3	30	26	0.5	563

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0.5	0.2	0.1	0.1
3	.6	.2	.2	.1
7	.6	.4	.3	.2
14	.9	.5	.3	.3
30	1.4	.7	.5	.4
60	2.3	1.3	1.1	.8
90	3.7	2.0	1.4	.9

03431800 - SYCAMORE CREEK NEAR ASHLAND CITY, TN

LOCATION.--Lat 36°19'12", long 87°03'04", Cheatham County, on downstream end of right bank pier of bridge on State Highway 49, at Sycamore, 3.2 miles north of Ashland City, and 4.4 miles upstream from Spring Creek.

DRAINAGE AREA.--97.2 mi².

PERIOD OF RECORD.--1962-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	11	80	23	20	159
99.1	12	70	30	10	280
99	12	60	40	5	482
98	13	50	53	2	1,000
95	15	40	74	1	1,640
90	18	30	106	0.5	2,500

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	13.5	10.7	9.70	9.05
3	14.0	11.0	9.96	9.28
7	14.3	11.3	10.3	9.67
14	15.5	12.2	11.1	10.4
30	18.3	13.6	11.9	10.9
60	21.9	16.3	14.4	13.0
90	25.8	18.2	15.8	14.2

03432500 - WEST HARPETH RIVER NEAR LEIPERS FORK, TN

LOCATION.--Lat 35°53'56", long 86°58'01", Williamson County, on downstream end of center pier of bridge on State Highway 96, 0.6 mile downstream from Murfrees Fork, 1.2 miles upstream from Leipers Fork, 1.8 miles east of town of Leipers Fork, and 5.8 miles west of the square in Franklin.

DRAINAGE AREA.--66.9 mi².

PERIOD OF RECORD.--1954-61.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.01	80	3.33	20	119
99.1	.03	70	7.17	10	212
99	.03	60	12.5	5	342
98	.06	50	21.5	2	628
95	.30	40	41.9	1	1,010
90	1.0	30	73.9	0.5	1,330

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0.1	0	0	0
3	.1	0	0	0
7	.2	0	0	0
14				
30				
60				
90				

03433500 - HARPETH RIVER AT BELLEVUE, TN

LOCATION.--Lat 36°03'16", long 86°55'42", Davidson County, on right bank
45 feet upstream from bridge on State Highway 100, 0.1 mile downstream
from Little Harpeth River, 0.9 mile southeast of Bellevue, and at mile
61.75.

DRAINAGE AREA.--408 mi² (includes 15 mi² without surface drainage).

PERIOD OF RECORD.--1921-29, 1932-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage
of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1.4	80	32	20	768
99.1	2.0	70	55	10	1,400
99	2.2	60	99	5	2,310
98	3.4	50	180	2	4,300
95	7.7	40	298	1	6,200
90	16	30	476	0.5	8,800

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	5.40	1.70	0.85	0.35
3	5.90	1.90	.95	.42
7	7.40	2.21	1.00	.48
14	9.03	3.18	1.69	.85
30	14.9	5.66	3.18	1.91
60	24.8	10.2	6.12	3.94
90	41.2	19.2	12.0	7.00

03434500 - HARPETH RIVER NEAR KINGSTON SPRINGS, TN

LOCATION.--Lat 36°07'18", long 87°05'56", Cheatham County, on right bank 400 feet upstream from bridge on U.S. Highway 70, 2 miles northeast of Kingston Springs, 3 miles downstream from Turnbull Creek, and at mile 32.4.

DRAINAGE AREA.--681 mi² (includes 15 mi² without surface drainage).

PERIOD OF RECORD.--1926-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	25	80	100	20	1,290
99.1	28	70	140	10	2,300
99	29	60	212	5	3,760
98	36	50	330	2	7,160
95	49	40	517	1	9,800
90	67	30	805	0.5	14,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	42.9	28.1	22.6	18.8
3	44.4	29.3	23.6	19.8
7	47.8	31.6	25.4	21.2
14	53.7	35.0	27.9	23.1
30	67.0	43.3	34.3	28.2
60	87.9	54.5	42.6	34.9
90	115	71.7	55.8	45.3

03435000 - CUMBERLAND RIVER BELOW CHEATHAM DAM, TN

LOCATION.--Lat 36°19'26", long 87°13'32", Cheatham County, on downstream end of lower lock wall at Cheatham Dam, 2.0 miles southwest of Neptune, 3.0 miles upstream from Half Pone Creek, 9.7 miles west of Ashland City, and at mile 148.4.

DRAINAGE AREA.--14,356 mi² at former lock and dam B prior to April 16, 1966; 14,163 mi² thereafter.

PERIOD OF RECORD.--

REMARKS.--Some regulation. Flow data from U.S. Army Corps of Engineers, 1980, Nashville District.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1,600	80	8,300	20	37,000
99.1	2,200	70	11,000	10	51,000
99	2,500	60	14,000	5	64,000
98	3,200	50	16,000	2	90,000
95	4,600	40	21,000	1	110,000
90	6,000	30	27,000	0.5	130,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	2,700	1,600	1,300	1,100
3	3,500	2,300	1,800	1,600
7	4,400	3,100	2,600	2,200
14	5,200	4,100	3,600	3,300
30	6,400	5,300	4,900	4,400
60				
90				

03435030 - RED RIVER NEAR PORTLAND, TN

LOCATION.--Lat 36°33'24", long 86°34'14", Sumner County, near left bank on downstream wingwall of county road bridge, 1.5 miles upstream from Austin Branch, 2.8 miles north of New Deal, 3.5 miles southwest of Portland, and at mile 93.0.

DRAINAGE AREA.--15.1 mi².

PERIOD OF RECORD.--1966-75.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	0.96	80	3.46	20	30.9
99.1	1.10	70	4.96	10	48.1
99	1.13	60	7.08	5	79.1
98	1.48	50	10.7	2	159
95	2.02	40	15.4	1	230
90	2.49	30	21.8	0.5	401

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	0.7	0.3	0.2	0.1
3	0.7	0.3	0.2	0.1
7	0.9	0.4	0.2	0.1
14				
30				
60				
90				

03435500 - RED RIVER NEAR ADAMS, TN

LOCATION.--Lat 36°35'19", long 87°05'21", Robertson County, on downstream end of right bank pier of bridge on U.S. Highway 41, 0.5 mile downstream from Elk Fork, 1.3 miles northwest of Adams, and at mile 33.0.

DRAINAGE AREA.--706 mi² (includes 397 mi² without surface drainage).

PERIOD OF RECORD.--1921-69.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	40.4	80	114	20	1,340
99.1	44.0	70	161	10	2,340
99	45.0	60	238	5	3,460
98	48.8	50	359	2	5,700
95	62.0	40	551	1	7,920
90	77.6	30	849	0.5	11,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	55.5	42.2	37.6	34.7
3	58.3	44.4	39.6	36.5
7	62.1	47.3	42.1	38.7
14	66.7	50.7	45.1	41.4
30	78.8	57.3	49.5	44.4
60	97.9	67.7	57.1	50.1
90	114	76.9	65.3	58.2

03436000 - SULPHUR FORK RED RIVER NEAR ADAMS, TN

LOCATION.--Lat 36°30'55", long 87°03'32", Robertson County, on left bank 600 feet downstream from county highway bridge, 2.8 miles downstream from Millers Creek, 4.1 miles southwest of Cedar Hill, 4.6 miles south of Adams, and 10.2 miles upstream from mouth.

DRAINAGE AREA.--186 mi² (includes 21 mi² without surface drainage).

PERIOD OF RECORD.--1940-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	5.2	80	24	20	317
99.1	6.1	70	35	10	590
99	6.4	60	52	5	950
98	8.1	50	79	2	1,750
95	12	40	124	1	2,600
90	16	30	195	0.5	3,400

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	9.93	6.05	4.60	3.63
3	10.2	6.16	4.66	3.66
7	11.0	6.57	5.00	3.93
14	11.9	7.30	5.64	4.56
30	15.2	9.65	7.78	6.58
60	20.9	13.0	10.3	8.60
90	24.1	15.4	12.8	11.2

03436100 - RED RIVER AT PORT ROYAL, TN

LOCATION.--Lat 36°33'17", long 87°08'31", Montgomery County, on left bank at county road bridge at Port Royal, 250 feet downstream from Sulphur Fork and at mile 25.5.

DRAINAGE AREA.--935 mi² (includes 437 mi² without surface drainage).

PERIOD OF RECORD.--1962-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	65	80	175	20	1,880
99.1	70	70	250	10	3,000
99	71	60	390	5	4,560
98	80	50	570	2	7,740
95	92	40	860	1	12,000
90	120	30	1,290	0.5	17,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	95.2	71.5	64.9	61.2
3	98.4	72.8	65.4	61.3
7	104	75.2	66.6	61.5
14	113	81.5	71.8	66.1
30	125	86.5	75.2	68.6
60	144	97.6	84.7	77.3
90	171	110	92.9	82.6

03436500 - CUMBERLAND RIVER AT CLARKSVILLE, TN

LOCATION.--Lat 36°31'20", long 87°22'40", Montgomery County, at Louisville & Nashville Railroad bridge at Clarksville, 1.3 miles upstream from Red River, 18.0 miles upstream from lock and dam C, and at mile 126.5.

DRAINAGE AREA.--15,897 mi², includes that of Red River.

PERIOD OF RECORD.--

REMARKS.--Flow regulated. Flow data extrapolated from information on Cumberland River below Cheatham Dam (03435000). Information provided by U.S. Army Corps of Engineers, 1980, Nashville District.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1,800	80	9,300	20	42,000
99.1	2,500	70	12,000	10	57,000
99	2,800	60	16,000	5	72,000
98	3,600	50	18,000	2	101,000
95	5,200	40	24,000	1	123,000
90	6,700	30	30,000	0.5	146,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	3,000	1,800	1,500	1,200
3	3,900	2,600	2,000	1,800
7	4,900	3,500	2,900	2,500
14	5,800	4,600	4,000	3,700
30	7,200	5,900	5,500	4,900
60				
90				

03436700 - YELLOW CREEK NEAR SHILOH, TN

LOCATION.--Lat 36°20'55", long 87°32'55", Montgomery County, on downstream end of left bank pier of bridge on State Highway 13, 2.5 miles downstream from Leatherwood Creek, 3 miles west of Shiloh, 7 miles upstream from mouth, and 9 miles east of Erin.

DRAINAGE AREA.--124 mi².

PERIOD OF RECORD.--1958-81.

REMARKS.--

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	21	80	37	20	243
99.1	23	70	46	10	400
99	23	60	62	5	600
98	24	50	87	2	1,110
95	27	40	122	1	1,800
90	31	30	175	0.5	2,600

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	24.8	20.7	19.1	17.9
3	25.1	21.0	19.4	18.3
7	26.0	21.8	20.2	19.1
14	27.1	22.7	21.2	20.2
30	28.8	25.2	24.1	23.4
60	32.1	27.6	26.4	25.7
90	35.6	29.6	27.7	26.5

03437000 - CUMBERLAND RIVER AT DOVER, TN

LOCATION.--Lat 36°29'26", long 87°50'20", Stewart County, on center pier of bridge on U.S. Highway 79 at Dover, 0.1 mile upstream from Dyers Creek, 0.8 mile upstream from lock and dam D, and at mile 88.8.

DRAINAGE AREA.--16,437 mi², at lock and dam D.

PERIOD OF RECORD.--

REMARKS.--Flow regulated. Flow data extrapolated from information on Cumberland River below Cheatham Dam (03435000). Information provided by U.S. Army Corps of Engineers, 1980, Nashville District.

FLOW DURATION

Flow in cubic feet per second, which was equaled or exceeded for percentage of time indicated.

Percentage	Discharge	Percentage	Discharge	Percentage	Discharge
99.5	1,900	80	9,600	20	43,400
99.1	2,600	70	12,400	10	59,000
99	2,900	60	16,500	5	74,400
98	3,700	50	18,600	2	104,000
95	5,400	40	25,000	1	127,000
90	6,900	30	31,000	0.5	151,000

LOW FLOW

Lowest average flow in cubic feet per second.

Period (consecutive days)	Recurrence interval (in years)			
	2	5	10	20
1	3,100	1,900	1,550	1,240
3	4,000	2,700	2,100	1,900
7	5,100	3,600	3,000	2,600
14	6,000	4,800	4,100	3,800
30	7,400	6,100	5,700	5,100
60				
90				