

Figure 1.--Location of low-flow measurement sites.

A severe drought occurred across large areas of Tennessee during the summer of 1988. Rainfall, which was below normal in the previous 2 years, totaled only 39.4 inches in 1988 and was 8.8 inches below the 1951-80 normal of 48.2 inches (Dave McIntosh, National Weather Service, oral commun., 1989). Streamflows across the State declined with the reduction in rainfall, and water supplies became critically low in several communities in Middle Tennessee that rely on surface-water sources for their supply.

To document the intensity (or severity) of the drought, the U.S. Geological Survey, in cooperation with the Tennessee Department of Health and Environment, measured low flows throughout the State during the summer of 1988. An intensive program, which initially included the measurement of streamflow at 198 sites, was begun in early July 1988 (fig. 1; table 1). Streamflow measurements were made at sites where flow was present, and dry conditions were recorded at sites where there was no flow. Measurements at selected sites from the network and at 60 additional sites were made during August and September 1988. The specific conductance and temperature of the water were recorded at most of the sites where a streamflow measurement was made. For most of the sites visited during July 1988, the 3-day 20-year (3Q20) recurrence-interval minimum flow had been defined during previous investigations (Bingham, 1985; 1986 a,b). The lowest measured flows in summer 1988 and the 3Q20 low-flow data are presented in figure 2. Data collected during the low-flow study, including the discharges and specific conductance and temperature measurements, are summarized in table 1.

CONVERSION FACTORS

For those readers who prefer to use metric units rather than inch-pounds, the following conversion factors may be used:

Multiply inch-pound units	By	To obtain metric units
square miles (mi ²)	2.590	square kilometers (km ²)
cubic feet per second (ft ³ /s)	0.02832	cubic meters per second (m ³ /s)

Temperature in degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) as follows:

$$^{\circ}\text{F} = 9/5 ^{\circ}\text{C} + 32$$

REFERENCES

Bingham, R.H., 1985, Low flows and flow duration of Tennessee streams through 1981: U.S. Geological Survey Water-Resources Investigations Report 84-4347, 325 p.

----- 1986, Regionalization of low-flow characteristics of Tennessee Streams: U.S. Geological Survey Water-Resources Investigations Report 85-4191, 63 p.

----- 1986, Regionalization of winter low-flow characteristics of Tennessee streams: U.S. Geological Survey Water-Resources Investigations Report 86-4007, 88 p.

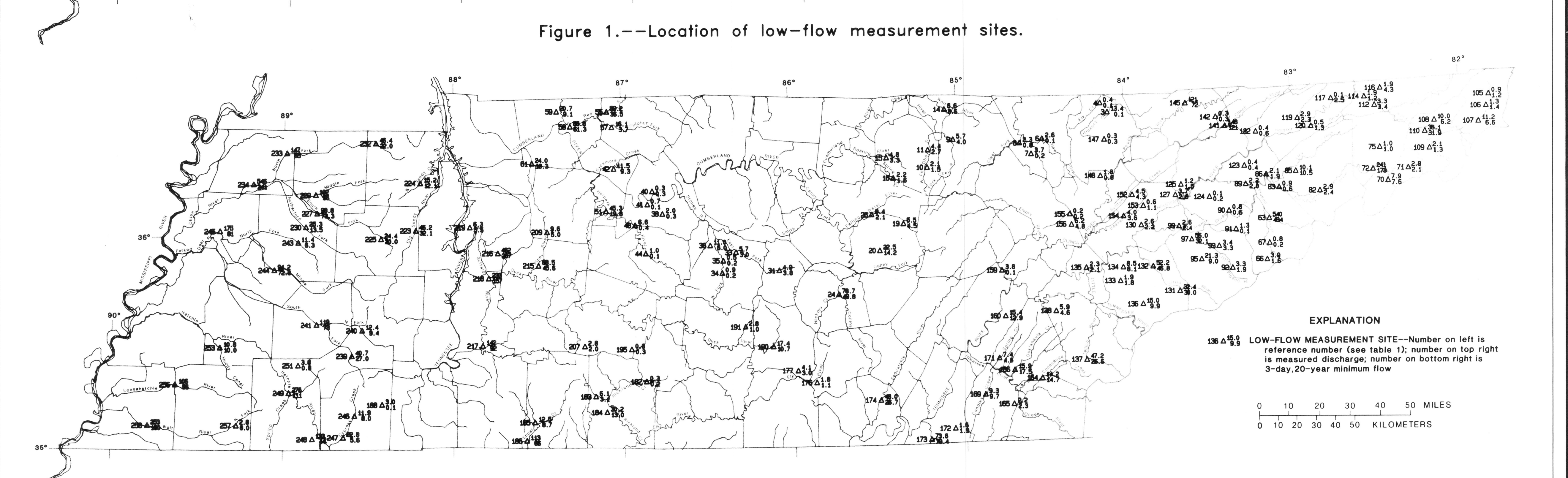


Figure 2.--Location of selected low-flow measurement sites having 3-day, 20-year minimum flow.

Table 1.--Discharge, water temperature, and specific conductance measurements for low-flow sites, summer 1988--Continued									
Site No.	Station Number	Station Name	County	Drainage area (mi ²)	Date measured	Discharge (cfs)	Water temperature (°F)	Specific conductance (µS/cm)	
GREEN RIVER BASIN									
1	03427287	Lane Fork Creek near Galen	Macon	22.0	07/05/88	2.35	23.5	214	
2	03427285	White Oak Creek at White Oak	Macon	20.6	07/05/88	5.32	23.0	209	
					08/19/88	10.79	26.5	215	
					08/29/88	10.9	22.5	215	
CUMBERLAND RIVER BASIN									
3	03462756	Clear Fork near Jellico	Campbell	240	07/05/88	13.4	24.0	880	
4	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
5	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
6	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
7	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
8	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
9	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
10	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
11	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
12	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
13	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
14	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
15	03462800	Elk Creek at Jellico	Campbell	198	07/05/88	17.9	23.5	875	
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