MARYLAND GEOLOGICAL SURVEY

Kenneth N. Weaver, Director

REPORT OF INVESTIGATIONS NO. 16

FLOW CHARACTERISTICS OF MARYLAND STREAMS

by

Patrick N. Walker

U. S. Geological Survey

Prepared in cooperation with the Geological Survey
United States Department of the Interior

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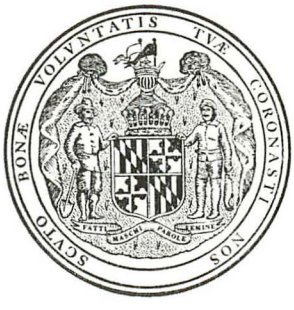

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FLOW CHARACTERISTICS OF MARYLAND STREAMS

By
Patrick N. Walker

ABSTRACT

Hydrologic data needed for the beneficial development of the surface-water resources of Maryland are presented in this report.

Mean annual discharge, magnitude and frequency of high and low flows, and flow-duration data are presented for 112 long-term continuous-record gaging stations. These data are based on records that were available through September 30, 1967, and thus include the drought of the 1960's.

The magnitude and frequency of selected low flows are presented for 6 short-term continuous-record stations and for 44 low-flow partial-record stations to provide additional areal coverage.

A method for determining flood frequency at ungaged sites is presented. Empirical equations relate physical features of a drainage system to peak discharges of selected recurrence intervals. These equations provide a user with the means to estimate the magnitude and frequency of flood peaks at an ungaged site and to evaluate the relative reliability of his estimate.

INTRODUCTION

The purpose of this report is to provide information on the flow characteristics of the rivers and streams of Maryland.

The report is an evolvement of an earlier report titled "Maryland Streamflow Characteristics" by John M. Darling, which was published in 1962 as Bulletin 25 of the Maryland Department of Geology, Mines and Water Resources (now the Maryland Geological Survey).

Bulletin 25 was based on streamflow data through September 30, 1958. The present report is based on data through September 30, 1967. Several stations which had short-term records in 1958, with the additional nine years of record, now are sufficiently long to permit analysis for this report.

The report covers the range of flow data from low-flow characteristics to peak-flow characteristics. The data presented are those that are useful to planners, consulting engineers and others who must design and plan for the most efficient use of our surface-water resources.

This report was prepared in the Maryland-Delaware-District of Columbia district office of the U. S. Geological Survey, Water Resources Division, under the direction of Walter F. White, District Chief, and under a cooperative agreement with the Maryland Geological Survey, Kenneth N. Weaver, Director.

PHYSICAL AND HYDROLOGIC ENVIRONMENT

Location and Extent

Maryland lies between 37° 53′ and 39° 43′ north latitude and 75° 04′ and 79° 29′ west longitude. The extreme length from east to west is 240 miles and the extreme width from north to south is 125 miles. The total area of the State is 10,577 square miles of which 9,891 square miles are land and 686 square miles are inland water. Chesapeake Bay covers many square miles not included in the above area.

Physiography

There are five physiographic provinces represented in Maryland—the Coastal Plain, Piedmont, Blue Ridge, Valley and Ridge, and Appalachian Plateau. The general boundaries of these provinces and their subdivisions are shown in figure 1. A brief description of each follows:

Coastal Plain.—The Coastal Plain in Maryland is composed of two distinct parts; (1) the Eastern Shore and (2) the Western Shore. The Eastern Shore is low, flat, and poorly drained by small sluggish streams. The Western Shore is more rolling with slightly less sluggish streams than the Eastern Shore. Most streams and rivers of the Coastal Plain are affected by tides for a considerable distance above their outlets to Chesapeake Bay.

Piedmont.—The Piedmont is characterized by rolling topography, low hills and ridges, and fairly steep stream slopes. It is well drained by the many streams and rivers that flow into the Chesapeake Bay.

Blue Ridge.—The Blue Ridge is represented in Maryland by Catoctin and South Mountains. It has rugged topography and relatively great relief. It is well drained, principally by Catoctin Creek and its tributaries.

Valley and Ridge.—The Valley and Ridge is separated in Maryland into the Great Valley and the Allegheny Ridges. The Great Valley is a gently rolling, broad lowland drained by Antietam and Conococheague Creeks. Streams have gentle slopes and meandering courses. Because cavernous limestone underlies the Valley, caves, sink holes, and springs are common and the streams tend to have a more uniform flow than do streams in other areas of the State. The Allegheny Ridges are a series of northeastward-trending hills that are remarkably level and uniform in elevation. They are drained by fairly steep, swift streams.

Appalachian Plateau.—The Appalachian Plateau is a broad dissected upland with pronounced relief and rugged topography. Streams draining the Plateau generally have steep gradients, rapids and water falls. Maryland streams that drain into the Ohio River basin are all in this province.

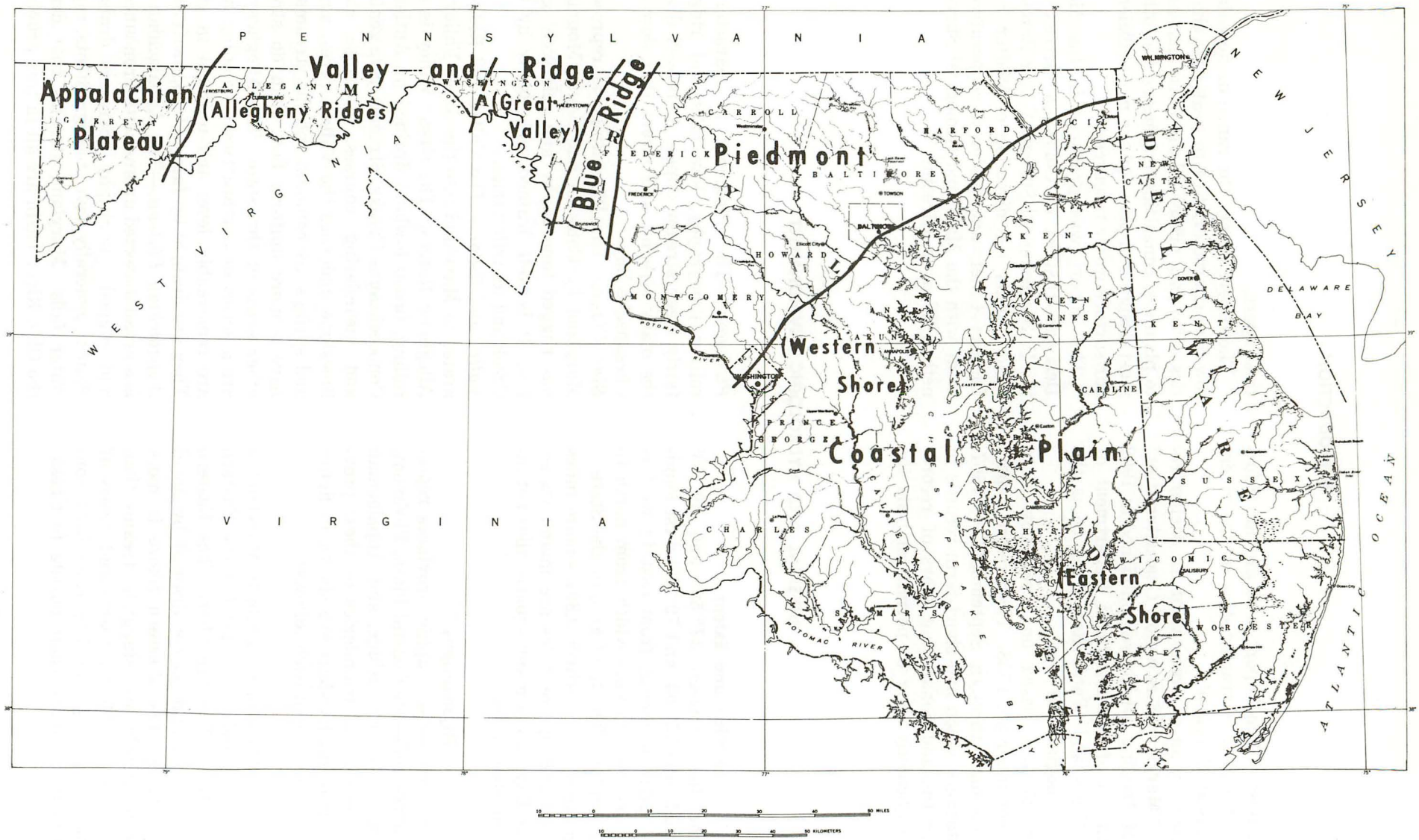

Figure 1.—Physiographic divisions of Maryland

Climate

Maryland has rather hot summers, mild winters and a fairly regular distribution of precipitation through the year. Seasons are well defined. Annual precipitation over the State ranges from about 36 to 48 inches. Precipitation is affected by the orographic effect of the mountains in the western part of the State. Moisture precipitates out of air masses that are cooled in their ascent up the mountain slopes with the result that one of the areas of the greatest annual precipitation, over 48 inches, occurs in the extreme western part of the State. As the moisture-depleted air moves eastward, a rain-shadow is formed and the least annual precipitation (less than 36 inches) falls in the Cumberland area, only some 50 miles from the wettest area. Another area of high precipitation is near the ocean on the southern Eastern Shore (figure 2).

More precipitation usually occurs during the summer months than during the other months of the year. However, during the summer, precipitation usually occurs from thunderstorms, and thus the amount of moisture is less dependable and more variable than from winter storms. Because of the variability both of amount and occurrence of precipitation, the summer usually is the time when streams experience the sharpest flood peaks and also the lowest flows.

A more detailed description of the geography, physiography, and climate of Maryland may be found in Vokes, 1957.[1]

EXPLANATION OF TERMS

Presentation of streamflow data requires the use of terms that may be unfamiliar to some readers. Because streamflows are variable in nature, they are represented by rates of flow which involve volume and time, and they are analyzed by statistical methods which involve other concepts of time.

A minimum number of different units have been used in this report. Factors for converting from one unit to another are given to facilitate their use. Some terms are considered to be familiar to all readers and are not explained in detail. Among these are: square mile (sq mi), U. S. gallon (gal), and feet (ft).

Cubic feet per second (*cfs*) is the unit used to express the rate of flow, or the discharge, of a stream. One cubic foot per second is equal to the discharge of a stream of square cross section, one foot wide and one foot deep, flowing water an average velocity of one foot per second.

1 cfs = 448.8 gallons per minute (gpm) = 0.646 million gallons per day (mgd)

Acre-feet (*ac-ft*) is a unit of volume. One acre-foot is the volume of water that would cover an area of one acre to a depth of one foot.

1 ac-ft = 43,500 cubic feet (cu ft) = 325,851 gal.

Gage-height is also called *stage* and is the height of the water surface in feet above an arbitrary gage datum. The elevation of gage datum is referred to mean sea level. The gage height added to the elevation of the gage datum will give the elevation in feet above mean sea level of the water surface at the gage.

Frequency and recurrence interval are terms often used interchangeably in referring to extremes of streamflow. Frequency of flow is a measure of the average number of extremes that will at least equal in severity a given extreme during a period of many years. Recurrence interval is defined as the average time, in years, between such extreme events. Although it cannot be predicted when a drought or flood of a given magnitude will occur, the probable number of such events during a reasonably long period of time may be estimated within reasonable limits of accuracy. For example, a low-flow discharge of 5 cfs having a recurrence interval of 10 years indicates that a discharge at least as low as 5 cfs will occur as an annual minimum about 5 times in 50 years, or 10

[1] Vokes, H. E., 1957, Geography and geology of Maryland: Maryland Geological Survey Bull. 19.

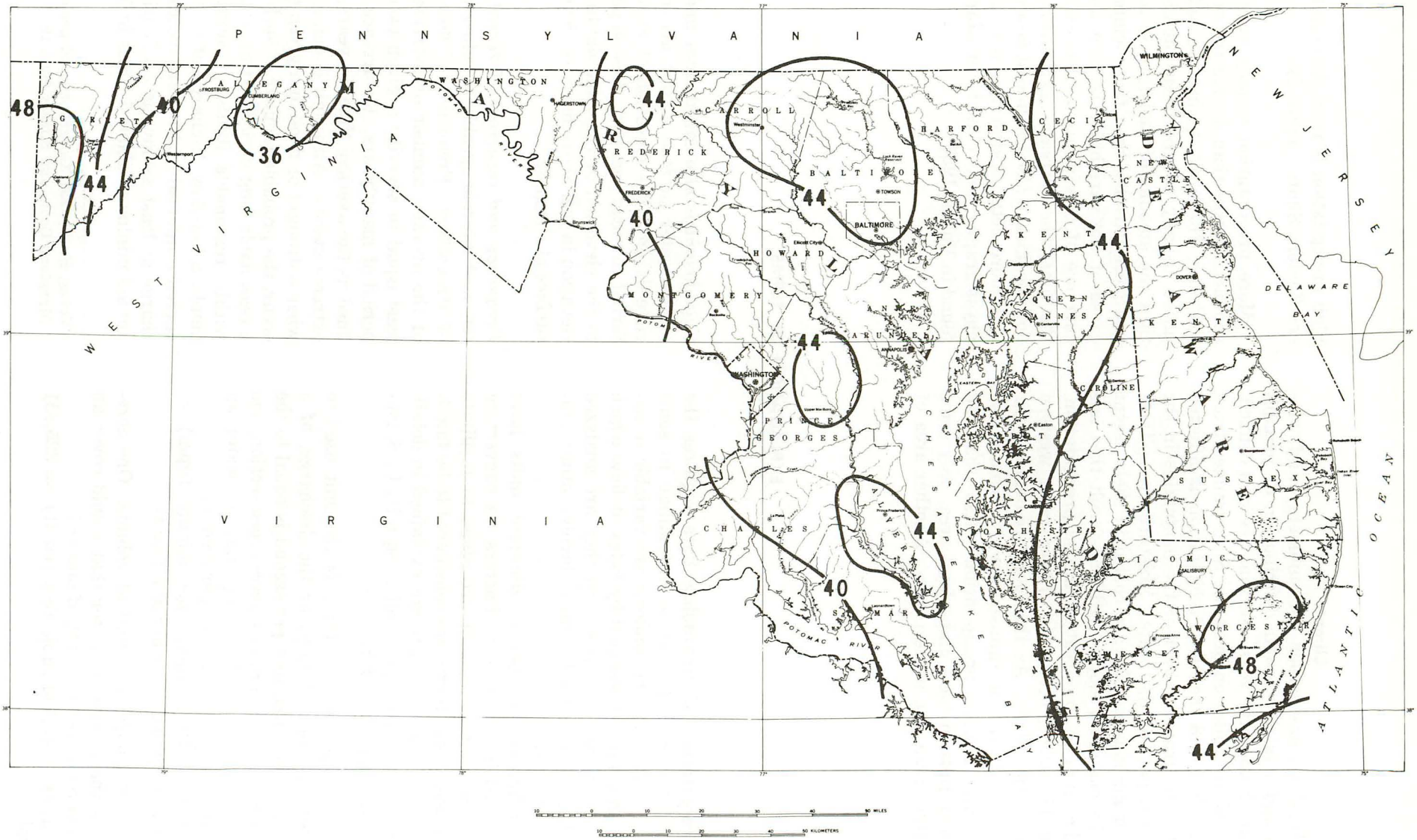

Figure 2.—Mean annual precipitation, in inches, based on period 1931 - 60.

times in 100 years. A flood peak of 1,000 cfs having a recurrence interval of 50 years indicate that about 4 flood peaks of at least 1,000 cfs will occur in a period of 200 years. Phrases such as "10-year discharge" are commonly used in discussing extremes having the indicated recurrence interval, in years. For example, "7-day, 10-year discharge" refers to the 7-day minimum discharge having a recurrence interval of 10 years.

Duration is the percent of time daily discharge at a point on a stream exceeds a certain indicated magnitude. The days are not necessarily consecutive. In tabulating duration data for a period of record, all the days that exceed the indicated magnitude are counted whether they occur singly or in groups. The word "duration" is also used to designate tables or curves that give the percentages for various magnitudes of discharge. Duration, in this sense, is not to be confused with the use of the word to indicate a continuous period of time, as "drought of 30 days' duration."

Water year is the 12-month period, October 1 through September 30. It is designated by the calendar year in which it ends. Thus the 12-month period that ended September 30, 1967 is called the 1967 water year. Average discharge, flood-frequency, and duration data are based on water years of record.

Climatic year is the 12-month period, April 1 through March 31. It is designated by the calendar year in which it begins. Thus the 12-month period that began April 1, 1966 is called the 1966 climatic year. The climatic year is used in this report as the basic time period for the analysis of annual low-flow events only.

Additional and more detailed hydrologic definitions are given by Langbein and Iseri (1960).[2]

STREAMFLOW CHARACTERISTICS

Streamflow characteristics for 112 long-term continuous-record gaging stations are presented in Appendix I and selected low-flow characteristics for 6 short-term continuous-record and 44 low-flow partial-record gaging stations are presented in Appendix II. All of the stations for which streamflow data are included in this report are listed in table 1 and are shown on plate 1.

Except where noted, all data given in this report represent essentially unregulated or natural flow. When regulated data are shown, they are identified by a general heading or, if only a small number of entries are affected, by the symbol "R" and a footnote. A dash entered in a space indicates that that characteristic was not determined. Most discharge figures are shown to the nearest tenth of a cubic foot per second for discharges less than 10 cfs; to whole numbers between 10 and 1000 cfs; and to three significant figures above 1000 cfs. Discharges less than 0.05 cfs are shown as zero flow. A description of the data in the report follows.

Long-term Gaging Stations

The long-term continuous-record gaging stations presented in Appendix I (referred to as "long-term stations" hereafter) are those stations for which adequate records were available as of September 30, 1967, to define the following:

1. High-flow frequency characteristics.
2. Low-flow frequency characteristics.
3. Flow-duration characteristics.

High- and low-flow frequency characteristics were not determined for stations with less than ten years of record and flow-duration characteristics were not determined for stations with less than five years of record. Low-flow characteristics based on reasonably long (10 years or more) records are used in preference to those based on records extended to a base period by correlation (H. C. Riggs, written communication, 1968). The low-flow characteristics determined from records of less than 10 years in length are determined by correlation with longer records but they are limited to a few selected data.

Records of annual maximum discharges were collected at some of the gages after their discontinuance as continuous-record stations. Where ten or more annual instantaneous maximum discharges were available, peak-flow frequency data were computed and are included.

[2] Langbein, W. B. and Iseri, K. T., 1960, General introduction and hydrologic definitions: U. S. Geol. Survey Water-Supply Paper 1541-A.

Table 1.--Gaging-station records included in this report

[Flow characteristics given in report: P - peak flow frequency; H - flood volume frequency; L - low-flow frequency; D - flow duration]

Station number	Station name	Drainage area (square miles)	Period of record (water years)	Data included	Page
	Pocomoke River basin				
1-4850	Pocomoke River near Willards, Md.	60.5	1950-67	P H L D	23
4855	Nassawango Creek near Snow Hill, Md.	44.9	1950-67	P H L D	24
	Manokin River basin				
4860	Manokin Branch (head of Manokin River) near Princess Anne, Md.	[a]5.8	1951-67	P H L D	25
	Wicomico River basin				
	North Prong Wicomico River:				
4865	Beaverdam Creek near Salisbury, Md.	19.5	1930-67	P H L D	26
	Nanticoke River basin				
4870	Nanticoke River near Bridgeville, Del.	75.4	1943-67	P H L D	27
	Marshy Hope Creek:				
4890	Faulkner Branch at Federalsburg, Md.	7.10	1950-67	P H L D	28
4895	Rewastico Creek near Hebron, Md.	12.2	1950-56; 1959-60	L D	29
	Transquaking River basin				
	Transquaking River:				
4900	Chicamacomico River near Salem, Md.	15.0	1951-67	P H L D	30
	Choptank River basin				
4910	Choptank River near Greensboro, Md.	113	1948-67	P H L D	31
4911.8	Watts Creek near Denton, Md.	[a]11	1964-67	L	147
4915	Tuckahoe Creek near Ruthsburg, Md.	85.2	1951-56	L D	32
	Kings Creek:				
4920	Beaverdam Branch at Matthews, Md.	5.85	1950-67	P H L D	33
	Wye River basin				
	Wye River:				
	Wye East River:				
4925	Sallie Harris Creek near Carmichael, Md.	8.09	1951-67	P L D	34
	Chester River basin				
	Andover Branch (head of Chester River):				
4929.8	Cypress Branch at Millington, Md.	[a]38	1964-66	L	147
	Chester River:				
4930	Unicorn Branch near Millington, Md.	22.3	1948-67	P H L D	35
4935	Morgan Creek near Kennedyville, Md.	10.5	1951-67	P H L D	36
4940	Southeast Creek at Church Hill, Md.	12.5	1951-67	P L D	37
4941	Old Mill Stream Branch (head of Corsica River) at Centreville, Md.	11.2	1953-54; 1964-67	L	147
	Sassafrass River basin				
	Sassafrass River:				
4945	Jacobs Creek near Sassafrass, Md.	5.39	1951-56	L D	38
	Elk River basin				
4950	Big Elk Creek at Elk Mills, Md.	52.6	1932-67	P H L D	39
4955	Little Elk Creek at Childs, Md.	26.8	1949-58	P L D	40
	Elk Creek:				
4955.5	Perch Creek near Elkton, Md.	[a]6.0	1964-67	L	147
	Northeast River basin				
4960	Northeast Creek (head of Northeast River) at Leslie, Md.	24.3	1949-67	P H L D	41
4960.5	Little Northeast Creek at Mechanic Valley, Md.	[a]14	1964-67	L	148
	Susquehanna River basin				
	Susquehanna River:				
5779.5	Broad Creek at Pylesville, Md.	11.3	1956-59; 1962-63; 1966	L	148
5785	Octoraro Creek near Rising Sun, Md.	193	1932-58; 1963-67	P H L D	42
5790	Basin Run at Liberty Grove, Md.	5.31	1949-59; 1965-67	P H L D	44
5800	Deer Creek at Rocks, Md.	94.4	1927-67	P H L D	45
	Swan Creek basin				
5807	Swan Creek at Swan Creek, Md.	13.2	1956-59; 1962-63; 1966	L	148
	Bush River basin				
5810	Bynum Run near Bel Air, Md.	7.50	1951-55	L D	46
5815	Bynum Run at Bel Air, Md.	8.52	1944-51; 1955-67	P H L D	47
5816	Bynum Run at Bush, Md.	22.5	1956-59; 1962-63; 1966	L	149
5816.5	James Run at Bush, Md.	11.1	1956-59; 1962-63; 1966	L	149
	Bush River:				
5816.6	Grays Run at Stepney, Md.	5.35	1956-59; 1962-63; 1966	L	149
5817.5	Winters Run (head of Otter Point Creek) near Bel Air, Md.	37.0	1954-59; 1962-63; 1966	L	149
	Gunpowder River basin				
	Gunpowder Falls:				
5818.5	Georges Run at Armacost, Md.	13.0	1956-59; 1962; 1966	L	150
5820	Little Falls at Blue Mount, Md.	52.9	1944-67	P H L D	48

[a]Approximately

Table 1.--Gaging-station records included in this report--Continued

Station number	Station name	Drainage area (square miles)	Period of record (water years)	Data included	Page
	Western Run:				
	Delaware Run:				
1-5830	Slade Run near Glyndon, Md.	2.09	1947-67	P H L D	49
5832	Blackrock Run at Coopersville, Md.	9.38	1956-59; 1962-63; 1966	L	150
5835	Western Run at Western Run, Md.	59.8	1944-67	P H L D	50
	Beaverdam Run:				
5835.8	Baisman Run at Broadmoor, Md.	1.47	1964-67	L	150
5836	Beaverdam Run at Cockeysville, Md.	20.8	1955-59; 1962-63; 1966	L	150
5840	Gunpowder Falls near Carney, Md.	314	1949-60	H L D	51
5842	Little Gunpowder Falls at Hess, Md.	16.5	1956-59; 1962-63; 1966	L	151
5845	Little Gunpowder Falls at Laurel Brook, Md.	36.1	1927-67	P H L D	52
5851	Whitemarsh Run at White Marsh, Md.	7.61	1959-67	L D	53
	Back River basin				
	Herring Run:				
5852	West Branch Herring Run at Idlewylde, Md.	2.13	1957-67	L D	54
5853	Stemmers Run at Rossville, Md.	4.94	1959-67	L D	55
5854	Brien Run at Stemmers Run, Md.	1.97	1958-67	L D	56
	Patapsco River basin				
	East Branch of North Branch Patapsco River:				
	West Branch of North Branch Patapsco River:				
5855	Cranberry Branch near Westminster, Md.	3.29	1949-67	P H L D	57
5860	North Branch Patapsco River at Cedarhurst, Md.	56.6	1945-67	P H L D	58
5862	Beaver Run at Finksburg, Md.	12.7	1957-59; 1961-63; 1966	L	151
5865	North Branch Patapsco River near Reisterstown, Md.	91.0	1927-54	P H L D	59
5866	Morgan Run near Gamber, Md.	26.0	1957-59; 1961-63; 1966	L	151
5870	North Branch Patapsco River near Marriottsville, Md.	165	1930-60	P H L D	60
5875	South Branch Patapsco River at Henryton, Md.	64.4	1948-67	P H L D	62
5880	Piney Run near Sykesville, Md.	11.4	1931-67	P H L D	63
5890	Patapsco River at Hollofield, Md.	285	1944-67	P H L D	64
5890.9	Stony Run at Elkridge, Md.	[a]9.4	1935, 1955, 1964-67	L	151
	West Branch Herbert Run:				
5891	East Branch Herbert Run at Arbutus, Md.	2.47	1957-67	P H L D	66
5892	Gwynns Falls near Owings Mills, Md.	4.90	1958-67	L D	67
5893	Gwynns Falls at Villa Nova, Md.	32.5	1957-67	P H L D	68
5893.3	Dead Run at Franklintown, Md.	5.52	1960-67	L D	69
5894.4	Jones Falls at Sorrento, Md.	25.2	1958-67	L	152
	Curtis Creek:				
5895	Sawmill Creek at Glen Burnie, Md.	4.97	1944-52; 1965-67	P L D	70
	Severn River basin				
5898	Severn Run at Benfield, Md.	[a]24	1955; 1961-62; 1964-67	L	152
	South River basin				
5900	North River (head of South River) near Annapolis, Md.	[a]8.5	1932-67	P H L D	71
5905	Bacon Ridge Branch at Chesterfield, Md.	6.92	1943-52; 1965-67	P L D	72
	Patuxent River basin				
5910	Patuxent River near Unity, Md.	34.8	1944-67	P H L D	73
	Cattail Creek:				
5912	Cattail Creek tributary at Carrs Mills, Md.	3.93	1956-59; 1961-63; 1966	L	152
5915	Cattail Creek at Roxbury Mills, Md.	27.7	1944-56	P H L D	74
5920	Patuxent River near Burtonsville, Md.	127	1911-45	P H L D	75
5925	Patuxent River near Laurel, Md.	132	1945-67	P H L D	76
5932	Little Patuxent River at Pine Orchard, Md.	7.03	1956-59; 1961-64; 1966	L	153
5935	Little Patuxent River at Guilford, Md.	38.0	1932-67	P H L D	78
5936	Middle Patuxent River near West Friendship, Md.	11.4	1956-59; 1961-64; 1966	L	153
5940	Little Patuxent River at Savage, Md.	98.4	1940-67	P H L D	79
5941	Hammond Branch at Scaggsville, Md.	3.01	1956-59; 1962-64; 1966	L	153
5944	Dorsey Run near Jessup, Md.	11.6	1948-58	P L D	80
5945	Western Branch near Largo, Md.	30.2	1950-67	P H L D	81
5945.25	Collington Branch at Upper Marlboro, Md.	22.9	1964-66	L	153

[a]Approximately

Table 1.--Gaging-station records included in this report--Continued

Station number	Station name	Drainage area (square miles)	Period of record (water years)	Data included	Page
1-5945.35	Mataponi Creek near Naylor, Md.	[a]14	1964-66	L	154
5945.45	Lyons Creek at Lyons Creek, Md.	[a]15	1964-67	L	154
5946	Cocktown Creek near Huntingtown, Md.	3.85	1957-67	P H L D	82
5948	St. Leonard Creek near St. Leonard, Md.	6.73	1957-67	P H L D	83
	Potomac River basin				
5950	North Branch Potomac River at Steyer, Md.	73.0	1956-67	P H L D	84
5955	North Branch Potomac River at Kitzmiller, Md.	225	1950-67	P H L D	85
5958	North Branch Potomac River at Barnum, W. Va.	266	1966-67	L	154
5960	North Branch Potomac River at Bloomington, Md.	287	1925-27; 1929-50	P H L D	86
5965	Savage River near Barton, Md.	49.1	1948-67	P H L D	87
5970	Crabtree Creek near Swanton, Md.	16.7	1948-67	P H L D	88
5975	Savage River below Savage River Dam, near Bloomington, Md.	106	1949-67	P H L D	89
5980	Savage River at Bloomington, Md.	115	1905-06; 1925-27; 1929-50	P H L D	90
5985	North Branch Potomac River at Luke, Md.	404	1899-1906; 1950-67	P H L D	91
5990	Georges Creek at Franklin, Md.	72.4	1905-06; 1930-67	P H L D	92
6000	North Branch Potomac River at Pinto, Md.	596	1939-67	P H L D	93
6010	Wills Creek below Hyndman, Pa.	146	1951-67	P H L D	95
	Jennings Run:				
6013	North Branch Jennings Run at Barrelville, Md.	[a]12	1964-67	L	155
6015	Wills Creek near Cumberland, Md.	247	1905-06; 1930-67	P H L D	96
6030	North Branch Potomac River near Cumberland, Md.	875	1929-67	P H L D	97
6035	Evitts Creek near Centerville, Pa.	30.2	1932-67	P H L D	99
6041.5	Collier Run at Spring Gap, Md.	[a]11	1964-67	L	155
	Potomac River:				
6090	Town Creek near Oldtown, Md.	148	1928-35	L D	100
6095	Sawpit Run near Oldtown, Md.	5.08	1948-59; 1963-67	P H L D	101
6100	Potomac River at Paw Paw, W. Va.	3,109	1939-67	P H L D	102
6125	Little Tonoloway Creek near Hancock, Md.	16.9	1947-63	P H L D	103
6130	Potomac River at Hancock, Md.	4,073	1933-67	P H L D	104
6135	Licking Creek near Sylvan, Pa.	158	1930-42	P H L D	105
6145	Conococheague Creek at Fairview, Md.	494	1928-67	P H L D	106
6178	Marsh Run at Grimes, Md.	18.9	1964-67	L	155
6180	Potomac River at Shepherdstown, W. Va.	5,936	1928-67	P H L D	107
6190	Antietam Creek near Waynesboro, Pa.	93.5	1948-51; 1965-67	L D	108
6191.5	Marsh Run at Fiddlesburg, Md.	[a]31	1965-67	L	156
6194.8	Little Antietam Creek at Keedysville, Md.	[a]24	1956; 1964-67	L	156
6195	Antietam Creek near Sharpsburg, Md.	281	1897-1905; 1928-67	P H L D	109
6365	Shenandoah River at Millville, W. Va.	3,040	1895-1909; 1928-67	P H L D	110
	Catoctin Creek:				
6370	Little Catoctin Creek at Harmony, Md.	8.83	1947-67	P H L D	111
6375	Catoctin Creek near Middletown, Md.	66.9	1947-67	P H L D	112
6385	Potomac River at Point of Rocks, Md.	9,651	1895-1967	P H L D	113
6390	Monocacy River at Bridgeport, Md.	173	1942-67	P H L D	114
6391	Piney Creek at Taneytown, Md.	22.9	1956-59; 1961-63; 1966	L	156
6394	Big Pipe Creek at Bachman Mills, Md.	9.39	1956-59; 1961-63; 1966	L	156
6394.5	Big Pipe Creek near Mayberry, Md.	51.6	1956-59; 1962-63; 1966	L	157
6394.7	Meadow Branch near Uniontown, Md.	12.6	1956-59; 1961-63; 1966	L	157
6395	Big Pipe Creek at Bruceville, Md.	102	1948-67	P H L D	115
6400	Little Pipe Creek at Avondale, Md.	8.10	1947-56; 1959-67	P L D	116
6401	Wolfpit Branch at Linwood, Md.	2.01	1956-59; 1961-63; 1967	L	157
6401.5	Little Pipe Creek at Union Bridge, Md.	40.4	1956-59; 1962-63; 1966	L	157
6405	Owens Creek at Lantz, Md.	5.93	1932-67	P H L D	117
6410	Hunting Creek at Jimtown, Md.	18.4	1950-67	P H L D	118
6415	Fishing Creek near Lewistown, Md.	7.29	1948-67	P H L D	119
6420	Monocacy River near Frederick, Md.	665	1896-1930	P H L D	120
6420.5	Israel Creek near Walkersville, Md.	[a]29	1964-66	L	158
6425	Linganore Creek near Frederick, Md.	82.3	1932; 1934-67	P H L D	121
6430	Monocacy River at Jug Bridge near Frederick, Md.	817	1930-67	P H L D	122
6431	Bush Creek at Ijamsville, Md.	[a]17.5	1964-66	L	158

[a]Approximately

Table 1.--Gaging-station records included in this report--Continued

Station number	Station name	Drainage area (square miles)	Period of record (water years)	Data included	Page
1-6435	Bennett Creek at Park Mills, Md.	62.8	1948-67	P H L D	123
6444	Little Seneca Creek (head of Seneca Creek) at Boyds, Md.	[a]21	1964-67	L	158
	Seneca Creek:				
6445	Great Seneca Creek near Gaithersburg, Md.	41.0	1925-31	L D	124
6450	Seneca Creek at Dawsonville, Md.	101	1930-67	P H L D	125
6452	Watts Branch at Rockville, Md.	3.70	1957-67	P H L D	126
6462.2	Rock Run near Cabin John, Md.	[a]4.8	1964, 1966	L	158
6465	Potomac River near Washington, D. C.	11,560	1930-67	P H L D	127
6465.5	Little Falls Branch near Bethesda, Md.	[a]4.1	1944-67	P H L D	129
6480	Rock Creek at Sherrill Drive, Washington, D. C.	62.2	1930-67	P H L D	130
6495	Northeast Branch Anacostia River at Riverdale, Md.	72.8	1938-67	P H L D	131
6505	Northwest Branch Anacostia River near Colesville, Md.	21.1	1924-67	P H L D	132
6510	Northwest Branch Anacostia River near Hyattsville, Md.	49.4	1938-67	P H L D	134
6535	Henson Creek (head of Broad Creek) at Oxon Hill, Md.	16.7	1948-67	P H L D	136
6536	Piscataway Creek at Piscataway, Md.	39.5	1965-67	L	159
6580	Mattawoman Creek near Pomonkey, Md.	57.7	1950-67	P H L D	137
	Chicamuxen Creek:				
6583	Reeder Run at Chicamuxen, Md.	[a]5.6	1964-67	L	159
	Wicomico River:				
6610	Chaptico Creek at Chaptico, Md.	10.7	1947-67	P H L D	138
6613	McIntosh Run (head of Breton Bay) at Tintop Hill, Md.	12.1	1964-67	L	159
6615	St. Marys River at Great Mills, Md.	24.0	1946-67	P H L D	139
	Ohio River basin				
	Allegheny River (head of Ohio River):				
	Monongahela River basin				
	Monongahela River:				
	Youghiogheny River:				
	Snowy Creek:				
3-0754	Laurel Run at Crellin, Md.	10.9	1964-67	L	160
755	Youghiogheny River near Oakland, Md.	134	1941-67	P H L D	140
765	Youghiogheny River at Friendsville, Md.	295	1898-1905; 1922-26; 1941-67	P H L D	141
	Bear Creek:				
765.8	South Branch Bear Creek near Accident, Md.	[a]6.0	1964-67	L	160
766	Bear Creek at Friendsville, Md.	48.9	1964-67	L	160
780	Casselman River at Grantsville, Md.	62.5	1947-67	P H L D	143
785	Big Piney Run near Salisbury, Pa.	24.5	1932-67	P H L D	144

[a]Approximately

Peak-flow frequency relations are widely used in the planning and design of stream improvements, bridges, and culverts, and in any studies requiring knowledge of the frequency of occurrence of maximum instantaneous discharge or stage.

Flood-volume characteristics are, in general, based on the log-Pearson Type III analysis but are not extended beyond a recurrence interval equal to twice the length of record available for analysis. Thus a 20-year record will furnish the 25-year value but not the 50-year value.

Flood-volume frequency is useful in studies of rainfall-runoff relations, in determinations of flood-storage capacities, in waste-dilution determinations, and in solving design problems requiring a knowledge of the probability of occurrence of high-flow quantities.

High-flow frequency characteristics at recurrence intervals of 2, 5, 10, 25, 50, and 100 years are shown where available. It is possible to determine the discharge at other recurrence intervals within the range of discharges given, by graphing the given values on log-probability paper using the appropriate probabilities of occurrence corresponding to the recurrence intervals given in table 2. The values in this table can be used for plotting either high- or low-flow frequency data.

Table 2.—Relationship of recurrence interval to probability of occurrence.

Recurrence interval, years	*Probability of occurrence, percent*
2	50
5	20
10	10
20	5
25	4
50	2
100	1

The flood-frequency curves were extended to the 100-year event for most of the stations. However, discharges at recurrence intervals greater than twice the length of record are shown in parentheses to indicate that these are considered only estimates. Because the estimates are based on extension beyond what is considered the limit of accuracy that is available from the data, they should be used only for the broadest reconnaissance studies and not for any design purpose.

High-flow frequency characteristics.—The high-flow frequency data consist of two separate yet related flow characteristics: These are first, the magnitude and corresponding frequency of annual instantaneous maximum discharges (peaks), and second, the magnitude and corresponding frequency of annual maximum average flow rates for periods of 1, 3 and 7 consecutive days (flood-volumes).

The method of analysis used as a base in determining the high-flow frequency characteristics is "the log-Pearson Type III" method.[3] In this method, the statistical moments (mean, standard deviation, and skew) are computed using the logarithms of flows rather than the natural numbers. These moments describe a frequency distribution curve that, because it has the same statistical characteristics as the original series, is a logical representation of that series. The curve can be plotted and flows with selected frequency of occurrence may be picked from it or the desired frequency characteristics may be computed from the equation of the curve. For this study, the computations were done by an electronic computer which was programmed to furnish selected flow-frequency data and a plot of computed and actual data points. The plots were used to compare the goodness-of-fit of the theoretical curve to the observed data.

The log-Pearson Type III analysis is modified, when necessary, to include data on historic floods or to reconcile the occasional "outlier-flood" or flood known to be a rarer event than would be indicated by mathematical analysis. In such cases, modification to the mathematical analysis was made graphically.

Low-flow frequency characteristics.—Low-flow frequency data are used primarily in the design of water-treatment and sewage-disposal works. The most widely accepted value for design is the 7-day, 10-year flow, which represents an uncommon but not an extremely rare event. Most of the long-term stations have at least 10 years of unregulated record available for the analysis of low flows. In the few instances where this was not the case, only the 7-day, 2, 5 and 10-year low flows are shown and these are computed by correlation with other long-term stations.

[3] Water Resources Council Hydrology Committee, 1967, A uniform technique for determining flood flow frequencies: Water Resources Council Bull. 15.

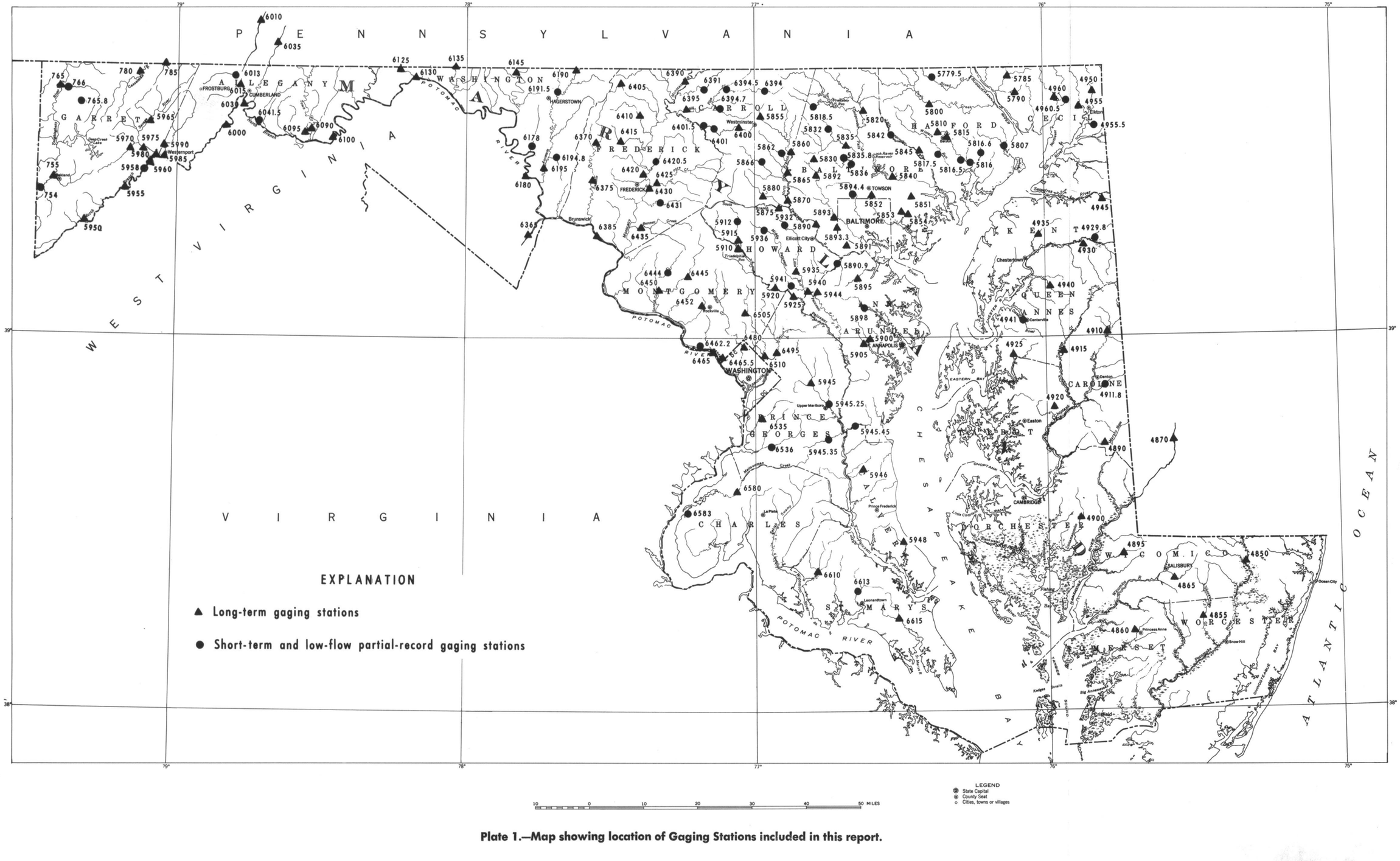

Plate 1.—Map showing location of Gaging Stations included in this report.

Low-flow frequency characteristics are given for the long-term stations for periods of 7, 14, 30, 60, 90 and 120 consecutive days and for recurrence intervals of 2, 5, 10, 20, 50 and 100 years, when possible.

The low-flow characteristics are determined from frequency curves developed using the log-Pearson Type III method of analysis applied to gaging-station low-flow data. Each computer-plotted curve was appraised; if the method did not fit the input data reasonably well, the curves were redrawn graphically. Some subjectivity is therefore inherent in the low-flow data and they should be used only within the range of the values given.

Ordinarily the curves are not extended to a recurrence interval greater than the length of the period of record. There are some exceptions where a 20-year flow is based on less than 20 years of record, because there is evidence that the record contained an event rarer than one of 20-year recurrence.

The effects of regulation on low flows are difficult to evaluate. The use of the 7-day average flow, which is usually the shortest period for which low-flow frequency is published, is meant to mininize the effects of minor regulation. The 7-day period is the length of a normal work-week and, when a mill or small hydroelectric plant is the source of regulation, the amounts of water stored and released during a week usually balance out. Any individual day, however, may be severely regulated.

The low flow of heavily regulated streams usually depends on the pattern of operation of the agency responsible for the regulation. In some cases there are no set rule curves and regulation is random. In other cases, an agency is required by law to release amounts of water sufficient to maintain a certain flow at an indicated measuring site. Thus, each variety of regulation is a different problem. In this report, some regulated flows are included in the frequency tabulations, and are identified as such. Data are given only for those regulated stations for which the regulation is considered relatively constant. Where possible, frequency data based on unregulated conditions are also included. A number of the North Branch Potomac River stations are in this category.

Effects of diversions also are difficult to evaluate unless reliable adjustments can be made as with records for Potomac River near Washington, D. C. Reliable records of diversions are available for this station and, although the diversions are a significant percent of the total flow, their effect can be evaluated and the natural flow frequency computed.

Diversions for irrigation are a special problem. Many streams are used as sources of irrigation water. Most of the irrigation withdrawals are believed to be small; however, there is little current information available on the amounts of water withdrawn. Irrigation withdrawals may be highly significant relative to the amount of flow in the source stream. The problem will continue to increase as the amount of irrigation increases.

Flow-duration characteristics.—A flow-duration curve is a cumulative frequency curve that shows the percent of time during which specified discharges were equalled or exceeded in a given period. The discharge at 16 duration points ranging from 0.5 percent to 99.9 percent are shown in the flow-duration tables. These points were selected to define the curve through most of the range of flows.

The flow-duration characteristics shown were picked from a duration curve developed from the whole period of record, whether natural or regulated flow, except in those instances where there was a significant change in the streamflow regimen during the period of record. In such cases, duration curves were developed for the periods before and for the periods after significant changes in regulation or diversion. At least 5 water years of consonant record was required for development of the duration curve for a period. Where regulated values are included with natural flows, they are footnoted "R". The duration characteristics may be plotted on log-probability paper to reconstruct the parent curve if it is so desired.

Flow-duration data are not as widely used now as they were prior to the development of the flow-frequency concepts because no information on sequence of flow is given by the duration curve. There is no direct mathematical relation between flow-duration and flow-frequency.

The reliability of the duration data given herein is related to the length of record upon which they are based and upon the period during which they were collected. Data based on a given period

of 5 years can differ significantly from data based on another 5-year period. Also, data based on a 5-year period may differ significantly from data based on 10 years or 20 years of record. A protracted dry or wet sequence of years will exert more influence on a short than a long record, for example, and the duration curve will be affected accordingly.

The data presented for the long-term stations usually represent natural flow. In some cases, portions of the data are based on essentially unregulated flows and portions are based on flows affected by regulation. An example of this is station 1-5855, Cranberry Branch near Westminster. This gaging station was established in September 1949 and has been in operation since that time. During the period September 1949 to August 1957, the flow was unregulated. In August 1957 an off-stream reservoir was built upstream from the station for the purpose of augmenting the municipal supply of Westminster. A pump with a capacity of 3 million gallons per day was installed and is used during periods of high streamflow to fill the reservoir. During low-flow periods when Westminster requires water, it is released from the reservoir to the creek channel and flows past the station. The amount of release varies and no daily records are available. The releases, however, are sufficiently large to make the records of low flows since 1957 unusable in the development of the low-flow frequency relations. There was insufficient record of pre-regulated conditions for the development of a complete set of frequency data such as given for most of the other long-term stations. The pump capacity, however, is too small to significantly affect the high-flow relations, so they were computed for the whole period of record. There was also sufficient record available to develop duration data for both the regulated and unregulated periods.

Short-term Gaging Stations

There are two types of short-term gaging stations included in this report. Data for both types are presented in Appendix II. The first type consists of continuous-record gaging stations for which there was not sufficient record to enable inclusion with the long-term stations. The second type consists of partial-record gaging stations at which only occasional low-flow measurements have been made. In no case can the data analysis for the short-term stations be considered as reliable an indicator as those for the long-term gaging stations.

This report includes only low-flow frequency data for 7-day 2-year, 10-year, and (when possible) 20-year recurrence intervals for the short-term gaging stations. These data were computed from correlations developed by plotting measured or daily observed discharges at a short-term gaging station versus concurrent daily discharges at a nearby long-term continuous-record station.

For the partial-record gaging stations, the number of measurements, the period during which they were made, and the long-term station with which they were correlated are given in headings over the tables to indicate the relative reliability of the data shown.

The six continuous-record stations that are included in the short-term group have less than five years of record. For these stations, the table heading contains information on extremes of flow and other information not available for the partial-record stations. The low-flow statistics for the continuous-record stations were determined by correlation with long-term stations using daily and 7-day discharges.

FLOOD-FREQUENCY AT UNGAGED SITES

Determination of the magnitude and frequency of flood flows at a given site is one of the most common problems that face an engineer designing a bridge or culvert or a planner concerned with proper development of the land adjacent to a stream. If a gaging station has been operated on the stream for a sufficient length of time to establish reliably the flood-frequency relation, and if that record was collected at a point sufficiently near to the locale of concern, then the station data should be used as a basis for design.

Often, however, no available gaging-station records meet the criteria, and flood-frequency data must be estimated for the problem area. Of the methods available for use, the one currently considered most reliable and useful is the multiple-regression method. The multiple regression method has the advantage of definable reliability,

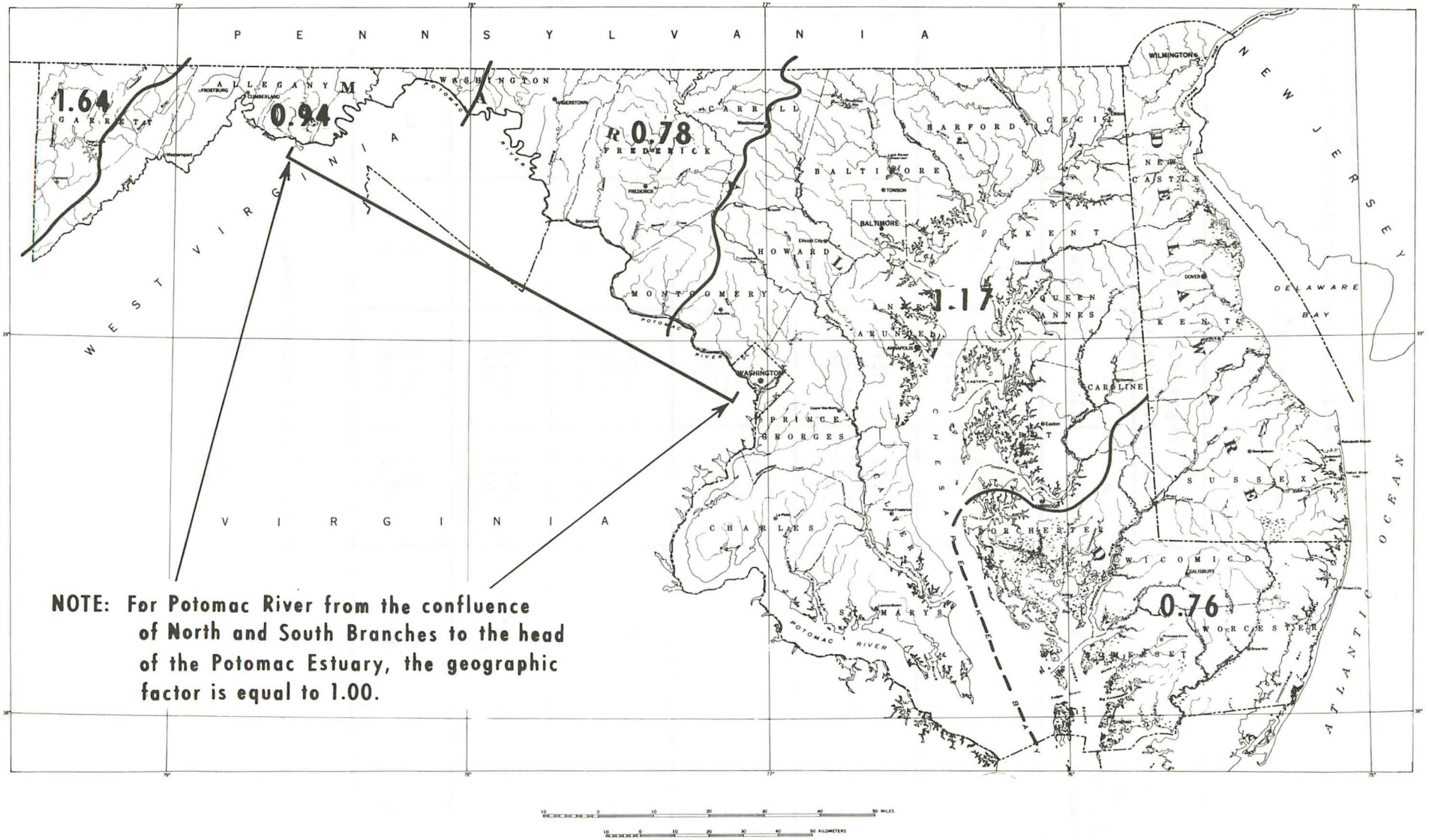

Figure 3.—Geographic factor for flood-frequency determination

Table 3. Summary of Maryland flood-peak regression relations.

(Model: $P_n = KA^aS^bF^cG^d$)

Recurrence interval (n), in years, for flood peaks (P)	Regression constant K	Regression exponents for indicated basin characteristics				Standard error ± %
		a Area(A)	b Slope(S)	c Forest(F)	d Geography(G)	
2	54.2	0.947	0.331	-0.394	0.809	31.7
	60.7	.945	.339	- .428	0	36.2
	17.1	.913	.274	0	0	42.9
5	88.9	.921	.329	- .362	.856	30.5
	100	.920	.338	- .398	0	35.1
	30.8	.890	.270	0	0	41.3
10	112	.908	.336	- .337	.956	32.4
	41.5	.883	.284	0	1.05	37.0
	42.0	.878	.288	0	0	43.2
25	141	.894	.350	- .302	1.11	37.4
	57.5	.871	.303	0	1.20	40.8
	58.3	.865	.308	0	0	48.2
50	46.0	.915	.377	0	.909	36.7
	42.8	.911	.410	0	0	41.3
100 *	84.9	.874	.350	0	1.25	38.4
	87.1	.858	.358	0	0	46.2

* Relations not valid for Coastal Plain drainage basins.

a feature lacking in the index-flood method (used in Bulletin 25). This, and the relative ease of application, are the principal reasons for the recommended use of the multiple-regression method.

The multiple-regression method of flood-frequency determination is a mathematical method by which the magnitude and frequency of floods may be estimated at an ungaged stream location by using physical characteristics of the basin. These characteristics may be determined from topographic maps published by the U. S. Geological Survey. Empirical equations are developed by relating floods of selected probability, based on flood records collected at long-term gaging stations, to physical characteristics of the drainage basins of the stations. The final equations use only those basin characteristics which have been found to be statistically significant to the relation. A set of equations is developed for each selected recurrence interval. Each set of equations is in the form:

$$P_n = K_n A^a B^b C^c \ldots M^m \pm S.E._{P_n}$$

where P is the magnitude of a peak flow of recurrence interval n,

K_n is a regression constant that varies with the number of basin characteristics used,

A, B, C, . . . M are basin characteristics,

$^{a,b,c,} \ldots ^{m}$ are regression exponents, and

$S.E._{P_n}$ is the standard error in percent of the estimated peak flow.

The user may select the equation he desires by deciding how many basin characteristics he wishes to use. For a reconnaissance study, he may wish to use the simplest equation and, upon deciding on a final site, he may then use the most detailed equation. The associated standard error given with each equation provides a measure of the reliability of the estimates.

The initial regression study included 4 basin charactertistics. They were:

1. Drainage area, A.
2. Channel slope, S.
3. Average basin elevation, E.
4. Percent of drainage area in forest, F.

In addition to the basin characteristics examined, there are other influences (such as geology) that affect flood-magnitude but which are not easily identified mathematically. The composite effect of these influences is included in the geographic factor, G, shown on figure 3. This factor is based upon a study of residuals which were determined by dividing actual gaging-station flood-frequency values by values computed by the regression equation. The residuals were plotted on a map and examined for regional trends. The average ratio was computed for each of 5 identified regions and final regression equations determined using the geographic factor as an additional characteristic.

Table 3 shows the regression constants, exponents and the standard error of estimate for flood peaks of 2, 5, 10, 25, 50, and 100-year recurrence intervals for use in the regression equations.

The average basin elevation was not found to significantly improve any of the estimates and was not included in the final equations. The forested area was found to be not statistically significant to the 50- and 100-year flood estimates.

Because of the limited data available for evaluating the coefficients for the 100-year equations, the equations for the 100-year flood are not valid for streams in the Coastal Plain (see fig. 1). The equations for all other recurrence intervals are valid state-wide.

The three basin characteristics used in the regression relation may be determined from topographic maps and the G factor from figure 3. When possible, the most recent U. S. Geological Survey 7½-minute quadrangle maps (scale 1: 24,000) should be used. Other maps may be used as long as the necessary information can be obtained from them. For full implementation of the method it is required that: (1) The stream site may be located accurately on the map used; (2) the drainage area tributary to the site can be determined; (3) the slope of the basin can be determined; and (4) the percent of the drainage area that is covered by forest can be determined.

As an example of the use of the method, assume that an estimate of the 25-year peak flow is required at a site with a drainage area (A) of 100 sq mi, a basin slope (S) of 20 ft/mi, a 30 percent forest cover (F) and whose entire basin lies in the area of the State that has a geographic factor (G) of 1.17.

Coefficients and exponents for the three equations that could be used to estimate the 25-year flood are in table 3. The equations are:

(1) $P25 = 141\ A^{0.894}\ S^{0.350}\ F^{-0.302}\ G^{1.11}$ (S.E. = ± 37.4%)

(2) $P25 = 57.5\ A^{0.871}\ S^{0.303}\ G^{1.20}$ (S.E. = ± 40.8%)

(3) $P25 = 58.3\ A^{0.865}\ S^{0.308}$ (S.E. = ± 48.2%)

For this illustration the 25-year peak will be estimated using each equation.

From equation (1):

$$P25 = (141)\ (100)^{0.894}\ (20)^{0.350}\ (30)^{-.302}\ (1.17)^{1.11}$$

$$P25 = \frac{(141)\ (61.4)\ (2.85)\ (1.19)}{(2.79)} = 10{,}500 \text{ cfs} \pm 37.4\%$$

From equation (2):

$$P25 = (57.5)\ (100)^{0.871}\ (20)^{0.303}\ (1.17)^{1.20}$$

$$P25 = (57.5)\ (55.1)\ (2.48)\ (1.21) = 9{,}500 \text{ cfs} \pm 40.8\%$$

From equation (3):

$$P25 = (58.3)\ (100)^{0.865}\ (20)^{0.303}$$

$$P25 = (58.3)\ (53.6)\ (2.52) = 7{,}900 \text{ cfs} \pm 48.2\%$$

The first computation provides the "best" estimate of the 25-year peak discharge (10,500 cfs with a standard error of estimate of ± 37.4%). The standard error of estimate indicates that about 2 out of 3 times (theoretically, in 68.26% of the cases) the "true" 25-year peak flow will be between 6,600 cfs and 14,400 cfs. The last computation provides the "worst" estimate; 7,900 cfs ± 48.2% or a range of from 4,100 cfs to 11,700 cfs.

If the stream in the example had been located in an area for which a different geographic factor applied (0.78, for example), the 25-year peak discharge would be estimated as follows:

From equation (1), 6,710 cfs ± 37.4%

From equation (2), 5,830 cfs ± 40.8%

From equation (3), 7,900 cfs ± 48.2%

It may be noted from these examples that the standard errors, in percent, are independent of the magnitude of the estimate.

The errors of estimate associated with these equations may appear to be inordinately large. However, considering that this is an estimating procedure meant to be used when there are no streamflow data available, the errors are within reasonable limits.

The drainage-basin area, in square miles, is usually determined for a site by delineating the basin boundary on the best maps of the area and measuring the enclosed area with a polar planimeter.

The slope of the basin, in feet per mile, as used in the equation is actually an index to the true slope. It is determined by: (1) measuring the distance along the main channel from the site to the drainage divide; (2) estimating the elevations at points 10 percent and 85 percent of that distance above the site; and (3) dividing the difference in the two elevations by the distance between them. For example, assume that the distance from a site to the drainage divide is measured and found to be 20 miles. The elevations at distances of 2 miles (10 percent) and 17 miles (85 percent) upstream from the site are estimated from the elevation contours found on the map. Assuming that these elevations are 100 feet at 10 percent, and 350 feet at 85 percent, the slope index would be (350-100) ÷ (17-2) or 16.7 ft/mile.

The forested area is determined by measuring or estimating the percent of the basin shown as forested on the topographic maps. If the maps that are available do not show forested areas, aerial photographs can be used to determine this characteristic.

The geographic factor, G, is selected from figure 3 by simply locating the stream on the map and reading the factor for that area. With the exception of the Potomac River, the areal boundaries follow drainage divides so that no basin requires more than one factor. For the North Branch Potomac River, use factor 0.94. For the mainstem

Table 4. Range of characteristics used in flood-frequency anaylsis.

Recurrence interval (years)	*Number of records used*	*Range of annual events used (number)*	*Range of drainage areas (sq. mi.)*	*Range of slope (ft./mi.)*	*Range of forested area (percent)*
2	86	15 — 70	2.1—11,560	1.5—263	8—100
5	86	15 — 70	2.1—11,560	1.5—263	8—100
10	86	15 — 70	2.1—11,560	1.5—263	8—100
25	86	15 — 70	2.1—11,560	1.5—263	8—100
50	42	25 — 70	5.2—11,560	2.6—202	14— 92
100	25	33 — 70	5.9—11,560	4.4—202	14— 92

Potomac River from the confluence of the North and South Branches to the head of the Potomac Estuary, use 1.00.

The multiple-regression equations given herein have limitations based on the data from which they were derived. The equations were based on 86 gaging-station records in and around Maryland. These are records of natural or unregulated flood peaks from 15 to 70 years in length. For floods of recurrence intervals of 25 years or less, all 86 records were used. For the 50-year flood, 41 stations with flood records 25 years or more in length were used and for the 100-year flood, 25 stations with 33 or more years of record were used. A summary of the range in characteristics used in the analysis in given in table 4.

An additional limitation given for the use of the equations is their lack of validity for those streams that are affected by urbanization. In general the discharges estimated by use of the equations will be too small by an undeterminable amount in urbanized areas. Urban development of an area which involves covering large areas with impervious pavement, changing drainage systems by land-grading, channelization of streams, installation of sewerage systems, and other changes, prohibits the use of estimating procedures based on records of natural events.

APPENDIX I
FLOW CHARACTERISTICS
FOR LONG-TERM GAGING STATIONS

POCOMOKE RIVER BASIN

1-4850. Pocomoke River near Willards, Md.

Location.--Lat 38°23'20", long 75°19'30", on left bank 30 ft downstream from bridge on State Highway 346, at Wicomico-Worcester County line, 0.6 mile upstream from Burnt Mill Branch, 1.3 miles east of Willards, Wicomico County, and 50.3 miles upstream from mouth.

Drainage area.--60.5 sq mi.

Records available.--December 1949 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 13.95 ft above mean sea level, datum of 1929, supplementary adjustment of 1962.

Average discharge.--17 years, (1950-67), 65.7 cfs.

Extremes.--1949-67: Maximum discharge, 884 cfs Jan. 8, 1962; maximum gage height, 12.03 ft Mar. 21, 1958; minimum discharge, 2.2 cfs Aug. 18, 19, 1957 (gage height, 1.91 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	643	776	851	933	(988)	(1,040)
Daily flow	623	748	808	867	-	-
3-day flow	506	636	706	779	-	-
7-day flow	340	450	516	595	-	-

*Based on water years 1950-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1950, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	5.8	3.4	2.6	2.0	-
14-day	6.6	4.3	3.4	2.7	-
30-day	8.0	5.0	4.0	3.3	-
60-day	9.0	5.5	4.4	3.7	-
90-day	11	6.0	4.7	4.0	-
120-day	15	8.5	6.4	5.2	-

Duration of daily flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
600	500	380	220	150	95	67	35	18	13	8.6	5.7	4.3	3.7	3.1	2.7

POCOMOKE RIVER BASIN

1-4855. Nassawango Creek near Snow Hill, Md.

Location.--Lat 38°13'45", long 75°28'20", on right bank 15 ft downstream from bridge on State Highway 12, 0.5 mile upstream from Furnace Branch, 0.6 mile downstream from Millville Creek and 5.5 miles northwest of Snow Hill, Worcester County.

Drainage area.--44.9 sq mi.

Records available.--December 1949 to September 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 12.29 ft above mean sea level, datum of 1929, supplementary adjustment of 1942.

Average discharge.--17 years (1950-67), 50.1 cfs.

Extremes.--1949-67: Maximum discharge, 988 cfs Aug. 16, 1953 (gage height, 7.82 ft); minimum, 0.80 cfs Sept. 8, 9, 10, 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	490	727	863	1,010	(1,100)	(1,180)
Daily flow	480	704	808	906	-	-
3-day flow	422	590	665	730	-	-
7-day flow	313	436	489	535	-	-

*Based on water years 1950-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1950, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.7	1.8	1.4	1.2	-
14-day	3.1	1.9	1.5	1.2	-
30-day	4.0	2.3	1.7	1.3	-
60-day	5.2	2.5	1.9	1.5	-
90-day	7.0	3.4	2.5	2.0	-
120-day	8.4	4.4	3.2	2.5	-

Duration of daily flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
470	390	300	190	120	74	52	24	10	5.9	3.6	2.5	1.8	1.6	1.4	1.0

MANOKIN RIVER BASIN

1-4860. Manokin Branch near Princess Anne, Md.

Location.--Lat 38°12'50", long 75°40'18", on right bank 5 ft downstream from farm bridge, 1.4 miles northeast of Princess Anne, Somerset County, and 1.6 miles upstream from confluence with Loretto Branch.

Drainage area.--5.8 sq mi, approximately.

Records available.--April 1951 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 8.03 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Average discharge.--16 years, 3.91 cfs.

Extremes.--1951-67: Maximum discharge, 237 cfs Aug. 13, 1955 (gage height, 6.63 ft), from rating curve extended above 120 cfs by logarithmic plotting; no flow at times in 1954, 1963, 1964, 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	118	192	240	299	(340)	(380)
Daily flow	67	112	143	183	-	-
3-day flow	45	67	79	93	-	-
7-day flow	28	41	48	57	-	-

*Based on water years 1951-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1952, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.1	0	0	0	0
14-day	.2	0	0	0	0
30-day	.2	.1	0	0	0
60-day	.3	.1	0	0	0
90-day	.4	.2	.1	0	0
120-day	.5	.2	.2	.1	-

Duration of daily flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
50	38	26	15	8.9	5.3	3.6	1.5	0.6	0.4	0.2	0.1	0	0	0	0

WICOMICO RIVER BASIN

1-4865. Beaverdam Creek near Salisbury, Md.

Location.--Lat 38°21'05", long 75°34'11", on upstream side of Schumaker Dam between spillway and emergency floodgate, three-quarters of a mile upstream from Beaglin Branch and 2 miles southeast of Salisbury, Wicomico County.

Drainage area.--19.5 sq mi.

Records available.--October 1929 to August 1933, May 1934 to September 1935, May 1936 to September 1967. Prior to October 1948, published as East Branch Wicomico River near Salisbury.

Gage.--Water-stage recorder and concrete spillway of dam for control. Datum of gage is 8.93 ft above mean sea level (city of Salisbury benchmark). Prior to Sept. 28, 1938, at site on left bank at datum 9.02 ft higher.

Average discharge.--32 years (1929-32, 1938-67), 23.2 cfs.

Extremes.--1929-67: Maximum discharge not determined, occurred Aug. 23, 1933, when dam was partly washed out; maximum gage height, 14.31 ft Aug. 4, 1948, from high-water mark in well; minimum daily discharge recorded, 0.40 cfs Dec. 17, 1963 (leakage under dam following closing of floodgate).

Remarks.--Records include flow over spillway, through spillway valve, over or through floodgate, and leakage under dam. Occasional regulation at low and medium flow caused by mill above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1929, to Sept. 30, 1932, and Oct. 1, 1938, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	243	453	618	853	1,050	(1,250)
Daily flow	174	301	391	509	597	-
3-day flow	138	226	287	364	420	-
7-day flow	94	146	180	222	253	-

*Based on water years 1930-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1930, to Mar. 31, 1932, and Apr. 1, 1939, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	5.4	$R_{2.8}$	$R_{1.4}$	$R_{0.7}$	-
14-day	6.4	4.4	3.5	$R_{2.5}$	-
30-day	7.6	5.2	4.3	3.5	-
60-day	8.6	6.4	5.4	4.7	-
90-day	9.6	7.0	6.0	5.2	-
120-day	10	7.2	6.3	5.6	-

R - Affected by regulation

Duration of daily flow

(Based on period Oct. 1, 1929, to Sept. 30, 1932, and Oct. 1, 1938, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
170	120	93	62	45	32	25	17	11	8.7	6.6	5.4	3.9	$R_{3.0}$	$R_{1.6}$	$R_{0.6}$

R - Affected by regulation

1-4870. Nanticoke River near Bridgeville, Del.

Location.--Lat 38°43'42", long 75°33'44", on left bank at highway bridge, 800 ft downstream from Gum Branch, 2.5 miles southeast of Bridgeville, Sussex County, Delaware, and 50.5 miles upstream from mouth.

Drainage area.--75.4 sq mi.

Records available.--April 1943 to September 1967. Prior to October 1955, published as Gravelly Fork near Bridgeville.

Gage.--Water-stage recorder. Timber control since Sept. 3, 1947. Datum of gage is 13.64 ft above mean sea level (levels by Soil Conservation Service). Prior to Apr. 19, 1947, staff gage and crest-stage gage at same site and datum.

Average discharge.--24 years, 90.4 cfs.

Extremes.--1943-67: Maximum discharge, 2,360 cfs Aug. 5, 1967 (gage height, 8.86 ft); minimum observed, 6.3 cfs Sept. 29, 1943. Maximum stage known, about 11.0 ft in September 1935, from information by local residents.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1943, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	561	1,000	1,400	2,040	2,650	(3,370)
Daily flow	528	949	1,310	1,890	2,410	-
3-day flow	460	792	1,060	1,470	1,810	-
7-day flow	366	577	725	921	1,070	-

*Based on water years 1943-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1943, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	22	16	14	12	-
14-day	23	18	15	13	-
30-day	25	19	15	13	-
60-day	28	20	17	14	-
90-day	33	23	19	16	-
120-day	36	26	21	18	-

Duration of daily flow

(Based on period Oct. 1, 1943, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
590	470	380	260	180	125	94	61	41	33	26	22	19	17	15	9.7

1-4890. Faulkner Branch at Federalsburg, Md.

Location.--Lat 38°42'45", long 75°47'35", on right bank 25 ft downstream from highway bridge on Nichols Road, 0.9 mile upstream from mouth, and 1 mile northwest of Federalsburg, Caroline County.

Drainage area.--7.10 sq mi.

Records available.--July 1950 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 16.70 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Jan. 1, 1967, graphic water-stage recorder at same site and datum.

Average discharge.--17 years, 8.77 cfs.

Extremes.--1950-67: Maximum discharge, 792 cfs Aug. 25, 1967 (gage height, 5.03 ft), from rating curve extended above 210 cfs on basis of slope-area measurement at gage height 4.10 ft; no flow at times during many years (result of pumpage for irrigation).

Remarks.--Diversion for irrigation of about 100 acres above station during some years.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow *	177	409	616	936	(1,210)	(1,520)
Daily flow	109	214	293	396	-	-
3-day flow	65	116	153	203	-	-
7-day flow	42	68	86	108	-	-

*Based on water years 1950-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1951, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.0	0.3	0.1	0	-
14-day	1.0	.5	.4	.3	-
30-day	1.3	.8	.7	.6	-
60-day	1.7	1.1	.8	.7	-
90-day	2.1	1.2	.9	.7	-
120-day	2.6	1.5	1.1	.9	-

Duration of daily flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
86	58	39	25	18	13	9.4	5.8	3.1	2.2	1.4	1.1	0.8	0.5	0.1	0

NANTICOKE RIVER BASIN

1-4895. Rewastico Creek near Hebron, Md.

Location.--Lat 38°24'40", long 75°45'15", on left wingwall of old mill sluiceway, on right bank of Rewastico Pond at outlet, 1.5 miles upstream from Little Creek, 2.8 miles north of Quantico, and 3.5 miles southwest of Hebron, Wicomico County.

Drainage area.--12.2 sq mi.

Records available.--December 1949 to September 1956. Annual maximum for water years 1959-60.

Gage.--Water-stage recorder May 1950 to September 1956. Crest-stage gage during water years 1959-60. Datum of gage is 1.8 ft above mean sea level, datum of 1929. Prior to May 16, 1950, staff gage at same site and datum.

Average discharge.--6 years, 8.88 cfs.

Extremes.--Maximum discharge not determined, occurred during 1960 (gage height, 5.70 ft); minimum, 0.8 cfs Oct. 18, 19, 1954 (gage height, 2.16 ft); minimum daily, 0.9 cfs Oct. 19, 1954.

Remarks.--Records comprised of flow through sluiceway and through 42-in culvert.

Magnitude and frequency of annual low flow

(Based on correlation with 1-4855 Nassawango Creek near Snow Hill, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.5	1.0	0.8	0.7	-

Duration of daily flow

(Based on period Oct. 1, 1950, to Sept. 30, 1956)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
61	47	36	25	18	13	9.4	6.2	4.2	3.2	2.3	2.0	1.6	1.4	1.3	1.1

TRANSQUAKING RIVER BASIN

1-4900. Chicamacomico River near Salem, Md.

Location.--Lat 38°30'45", long 75°52'50", on left bank 30 ft downstream from Big Mill Pond dam, 1.6 miles east of Salem, Dorchester County, and 13 miles upstream from mouth.

Drainage area.--15.0 sq mi.

Records available.--April 1951 to September 1967.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Average discharge.--16 years, 16.8 cfs.

Extremes.--1951-67: Maximum discharge, 518 cfs Aug. 25, 1967 (gage height, 4.42 ft); minimum, 0.4 cfs May 23, 1964, June 11, 1965, result of regulation; minimum daily, 0.5 cfs June 11, 1965.

Remarks.--Occasional regulation by Big Mill Pond.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	210	336	428	552	(649)	(750)
Daily flow	155	237	291	356	-	-
3-day flow	107	169	213	273	-	-
7-day flow	74	107	129	156	-	-

*Based on water years 1951-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1952, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.3	2.2	1.8	1.5	-
14-day	3.6	2.8	2.5	2.2	-
30-day	4.4	3.2	3.0	2.8	-
60-day	4.6	4.0	3.6	3.4	-
90-day	5.5	4.6	4.2	3.8	-
120-day	6.3	5.0	4.5	4.2	-

Duration of daily flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
140	100	68	44	32	23	18	12	7.8	5.9	4.5	3.8	3.0	2.6	2.1	R 0.8

R - Affected by regulation

CHOPTANK RIVER BASIN

1-4910. Choptank River near Greensboro, Md.

Location.--Lat 38°59'50", long 75°47'10", on left bank at highway bridge, 0.1 mile upstream from Gravelly Branch, 2 miles northeast of Greensboro, Caroline County, and 60 miles upstream from mouth.

Drainage area.--113 sq mi.

Records available.--January 1948 to September 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3.51 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Average discharge.--19 years, 121 cfs.

Extremes.--1948-67: Maximum discharge, 6,970 cfs Aug. 4, 1967 (gage height, 14.47 ft); minimum, 1.2 cfs Aug. 29, 1966.

Remarks.--Slight diurnal fluctuation at low flow caused by mill above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	1,590	2,950	4,000	5,450	(6,750)	(8,340)
Daily flow	1,500	2,750	3,800	5,200	-	-
3-day flow	1,060	2,050	2,790	3,750	-	-
7-day flow	714	1,250	1,580	1,980	-	-

*Based on water years 1948-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	10	6.0	4.5	3.4	-
14-day	12	7.3	5.7	4.5	-
30-day	14	8.8	7.0	5.8	-
60-day	17	10	8.3	6.8	-
90-day	20	13	11	9.0	-
120-day	26	15	12	9.9	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,270	930	720	440	270	160	110	58	30	21	14	11	8.1	6.6	5.4	$R_{2.5}$

R - Affected by regulation

CHOPTANK RIVER BASIN

1-4915. Tuckahoe Creek near Ruthsburg, Md.

Location.--Lat 38°58'00", long 75°56'35", at highway bridge 0.1 mile downstream from Blockston Branch, and 2.6 miles south of Ruthsburg, Queen Annes County.

Drainage area.--85.2 sq mi.

Records available.--March 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Average discharge.--5 years, 94.3 cfs.

Extremes.--1951-56: Maximum discharge, 1,620 cfs Aug. 13, 1955 (gage height, 5.87 ft); minimum, 13 cfs Sept. 15, 1955; minimum gage height, 0.18 ft Aug. 4, 5, Oct. 13, 14, 1954; minimum daily, 14 cfs for several days in 1954, 1955, and 1956.

Magnitude and frequency of annual low flow

(Based on correlation with 1-4910 Choptank River near Greensboro, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	14	8.9	7.0	-	-

Duration of daily flow

(Based on period Oct. 1, 1951, to Sept. 30, 1956)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
790	610	470	310	200	130	96	53	31	26	20	17	15	15	14	14

1-4920. Beaverdam Branch at Matthews, Md.

Location.--Lat 38°48'40", long 75°58'15", on left bank 50 ft upstream from bridge on State Highway 328, 1 mile west of Matthews, Talbot County, and 1.2 miles upstream from mouth.

Drainage area.--5.85 sq mi.

Records available.--July 1950 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 2.33 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Jan. 1, 1967, graphic water-stage recorder at same site and datum.

Average discharge.--17 years, 6.58 cfs.

Extremes.--1950-67: Maximum discharge, 2,200 cfs Sept. 12, 1960 (gage height, 10.24 ft, from high-water mark in gage shelter) from rating curve extended above 440 cfs on basis of contracted-opening measurement at gage height 7.15 ft; no flow at times during many years.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	272	596	968	1,730	(2,590)	(3,830)
Daily flow	140	294	465	860	-	-
3-day flow	67	132	200	325	-	-
7-day flow	43	76	100	132	-	-

*Based on water years 1950-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1951, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.1	0	0	0	0
14-day	.1	0	0	0	0
30-day	.2	.1	0	0	0
60-day	.4	.1	.1	0	0
90-day	.5	.2	.2	.1	-
120-day	.9	.3	.2	.2	-

Duration of daily flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
95	70	48	25	14	7.9	5.3	2.6	0.9	0.4	0.2	0.1	0	0	0	0

1-4925. Sallie Harris Creek near Carmichael, Md.

Location.--Lat 38°57'55", long 76°06'30", on left bank 30 ft upstream from bridge on U.S. Highway 50, 2 miles northeast of Carmichael, Queen Annes County, and 2.4 miles upstream from mouth.

Drainage area.--8.09 sq mi.

Records available.--June 1951 to September 1956. Annual maximum for water years 1957-67.

Gage.--Water-stage recorder June 1951 to September 1956. Crest-stage gage during water years 1957-67. Altitude of gage is 15 ft (from topographic map).

Average discharge.--5 years, 8.22 cfs.

Extremes.--Maximum discharge, 1,240 cfs Sept. 12, 1960 (gage height, 7.43 ft), from rating curve extended above 370 cfs by logarithmic plotting; minimum, 1.3 cfs Sept. 29, 1954; minimum gage height, 0.38 ft Aug. 1, 4, 1954, July 23, 1955, minimum daily, 1.5 cfs Aug. 3-6, 1955.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	171	483	845	1,610	(2,510)	(3,810)

Magnitude and frequency of annual low flow

(Based on correlation with 1-4930 Unicorn Branch near Millington, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.8	1.4	1.2	-	-

Duration of daily flow

(Based on period Oct. 1, 1951, to Sept. 30, 1956)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
104	70	47	25	16	8.8	6.5	4.3	3.1	2.7	2.1	1.9	1.8	1.7	1.7	1.6

1-4930. Unicorn Branch near Millington, Md.

Location.--Lat 39°15'00", long 75°51'40", on right bank 20 ft upstream from bridge on State Highway 313, 0.2 mile downstream from Unicorn Mill Pond, 0.9 mile upstream from mouth and 1.4 miles southwest of Millington, Kent County.

Drainage area.--22.3 sq mi.

Records available.--January 1948 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 3.57 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Graphic water-stage recorder prior to Jan. 1, 1967, at same site and datum.

Average discharge.--19 years, 23.1 cfs.

Extremes.--1948-67: Maximum discharge, 1,060 cfs Sept. 12, 1960 (gage height, 7.17 ft); no flow for part of each day June 13, 14, 1965, caused by regulation at Unicorn Mill Pond.

Remarks.--Occasional regulation at low flow by fish hatchery above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	283	508	694	974	(1,220)	(1,490)
Daily flow	194	333	444	604	-	-
3-day flow	133	231	311	430	-	-
7-day flow	94	153	194	247	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	6.6	4.8	3.9	$R_{3.3}$	-
14-day	7.2	5.4	4.3	3.6	-
30-day	7.6	5.6	4.6	3.9	-
60-day	8.8	6.4	5.2	4.4	-
90-day	9.5	6.8	5.8	5.0	-
120-day	10	7.2	6.0	5.2	-

R - Affected by regulation

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
190	140	105	66	44	30	24	15	10	8.4	6.9	5.8	4.7	$R_{3.5}$	$R_{2.6}$	$R_{0.3}$

R - Affected by regulation

CHESTER RIVER BASIN

1-4935. Morgan Creek near Kennedyville, Md.

Location.--Lat 39°16'50", long 76°00'55", on right bank 200 ft upstream from highway bridge, 2 miles southwest of Kennedyville, Kent County, and 4 1/2 miles upstream from mouth.

Drainage area.--10.5 sq mi.

Records available.--May 1951 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map). Prior to Jan. 1, 1967, graphic water-stage recorder at same site and datum.

Average discharge.--16 years, 9.18 cfs.

Extremes.--1951-67: Maximum discharge, 1,530 cfs Sept. 12, 1960 (gage height, 8.88 ft), from rating curve extended above 440 cfs by logarithmic plotting; minimum, 0.60 cfs Aug. 28, 29, 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	357	673	938	1,330	(1,680)	(2,060)
Daily flow	185	320	425	572	-	-
3-day flow	91	141	178	226	-	-
7-day flow	48	71	86	103	-	-

*Based on water years 1951-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1952, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.9	1.8	1.4	1.0	-
14-day	3.2	2.0	1.5	1.1	-
30-day	3.7	2.2	1.6	1.2	-
60-day	4.3	2.7	2.1	1.6	-
90-day	4.9	3.0	2.2	1.7	-
120-day	5.4	3.4	2.6	2.0	-

Duration of daily flow
(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
115	68	46	26	16	9.7	7.8	5.5	4.3	3.7	3.0	2.4	1.9	1.2	0.9	0.8

CHESTER RIVER BASIN

1-4940. Southeast Creek at Church Hill, Md.

Location.--Lat 39°07'57", long 75°58'51", on right bank 10 ft upstream from culvert on private road, 600 ft downstream from small tributary, 0.7 mile south of Church Hill, Queen Annes County, and 5 1/2 miles upstream from mouth.

Drainage area.--12.5 sq mi.

Records available.--June 1951 to September 1956. Annual maximum for water years 1957-65.

Gage.--Water-stage recorder June 1951 to September 1956. Crest-stage gage during water years 1957-65. Altitude of gage is 20 ft (from topographic map).

Average discharge.--5 years, 12.6 cfs.

Extremes.--Maximum gage height, 10.4 ft, Sept. 12, 1960 (discharge not determined); minimum, 1.3 cfs July 23, 1955; minimum daily, 1.6 cfs Sept. 6, 7, 1954.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1951, to Sept. 30, 1959, and Oct. 1, 1960, to Sept. 30, 1965)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	465	829	1,170	1,730	(2,280)	(2,940)

Magnitude and frequency of annual low flow

(Based on correlation with 1-4930 Unicorn Branch near Millington, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.5	1.7	1.4	-	-

Duration of daily flow

(Based on period Oct. 1, 1951, to Sept. 30, 1956)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
170	120	67	40	24	15	11	6.4	4.5	3.7	3.0	2.5	2.2	2.1	2.0	1.8

SASSAFRAS RIVER BASIN

1-4945. Jacobs Creek near Sassafras, Md.

Location.--Lat 39°21'50", long 75°49'13", on upstream right wing-wall of bridge on State Highway 290, 1.2 miles southwest of Sassafras, Kent County, and 1.4 miles upstream from mouth.

Drainage area.--5.39 sq mi.

Records available.--June 1951 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Average discharge.--5 years, 5.00 cfs.

Extremes.--1951-56: Maximum discharge, 229 cfs Aug. 13, 1955 (gage height, 5.59 ft), from rating curve extended above 73 cfs by logarithmic plotting; minimum, 1.2 cfs Aug. 5, 1955; minimum daily, 1.5 cfs Aug. 4, 5, 1955.

Magnitude and frequency of annual low flow

(Based on correlation with 1-4930 Unicorn Branch near Millington, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.4	1.8	1.4	-	-

Duration of daily flow

(Based on period Oct. 1, 1951, to Sept. 30, 1956)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
32	25	19	11	7.9	6.2	5.2	3.8	2.8	2.7	2.5	2.4	2.2	2.1	2.0	1.6

ELK RIVER BASIN

1-4950. Big Elk Creek at Elk Mills, Md.

Location.--Lat 39°39'26", long 75°49'20", on right bank 100 ft downstream from highway at Elk Mills, Cecil County, and 7 miles upstream from confluence with Little Elk Creek.

Drainage area.--52.6 sq mi.

Records available.--April 1932 to September 1967. Monthly discharge only for some periods, published in WSP 1302.

Gage.--Digital water-stage recorder. Datum of gage is 68.5 ft above mean sea level, datum of 1929. Prior to Oct. 7, 1939, wire-weight gage and Oct. 7, 1939, to May 16, 1946, wire-weight gage and crest-stage gage at bridge 100 ft upstream at same datum. May 17, 1946, to Sept. 30, 1961, graphic water-stage recorder at present site and datum.

Average discharge.--35 years, 67.1 cfs.

Extremes.--1932-67: Maximum discharge, 10,600 cfs July 5, 1937 (gage height, 14.5 ft, from floodmarks), from rating curve extended above 1,700 cfs on basis of velocity-area and conveyance studies; minimum, 4.5 cfs Jan. 21, 1955 (result of freezeup); minimum daily, 4.8 cfs Sept. 8-10, 1966; minimum gage height observed, 2.09 ft Sept. 19, 22-24, 1932.
Maximum stage known, about 19 ft in June 1884, from information by local residents.

Remarks.--Slight diurnal fluctuation caused by mills above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	3,110	4,870	6,290	8,410	10,200	(12,300)
Daily flow	1,080	1,560	1,900	2,370	2,750	-
3-day flow	540	763	924	1,150	1,320	-
7-day flow	303	420	507	630	730	-

*Based on water years 1932-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1932, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	19	12	8.9	7.2	5.4
14-day	20	13	9.6	7.7	5.8
30-day	22	14	11	8.7	6.7
60-day	26	17	13	11	8.3
90-day	30	19	15	12	10
120-day	33	22	18	15	12

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
770	480	310	170	110	78	63	45	33	27	20	16	12	9.8	8.0	5.6

ELK RIVER BASIN

1-4955. Little Elk Creek at Childs, Md.

Location.--Lat 39°38'30", long 75°52'00", on right bank at bridge, 0.2 mile southeast of Childs, Cecil County, 1.6 miles upstream from Laurel Run, and 6.1 miles upstream from confluence with Big Elk Creek.

Drainage area.--26.8 sq mi.

Records available.--October 1948 to September 1958.

Gage.--Water-stage recorder and concrete control. Datum of gage is 66.72 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 38.2 cfs.

Extremes:--1948-58: Maximum discharge, 5,400 cfs Aug. 12, 1955 (gage height, 8.37 ft), from rating curve extended above 690 cfs on basis of slope-area measurement at gage height 5.24 ft, computation of peak flow over dam, and conveyance studies; minimum, 0.4 cfs July 31, Sept. 5, 1954 (gage height, 1.31 ft); minimum daily, 3.3 cfs July 31, 1954.

Remarks.--Some regulation by paper mills above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1958)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,580	2,360	3,190	(4,750)	(6,410)	(8,660)

Magnitude and frequency of annual low flow

(Based on correlation with 1-4950 Big Elk Creek at Elk Mills, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	8.8	5.6	4.1	3.4	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
450	350	220	110	64	42	34	23	17	14	11	8.2	6.7	5.8	5.2	4.2

1-4960. Northeast Creek at Leslie, Md.

Location.--Lat 39°37'40", long 75°56'40", on left bank at downstream side of highway bridge, 0.7 mile northeast of Leslie, Cecil County, and 1.7 miles upstream from confluence with Little Northeast Creek.

Drainage area.--24.3 sq mi.

Records available.--October 1948 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 115.0 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--19 years, 32.0 cfs.

Extremes.--1948-67: Maximum discharge, 4,060 cfs Aug. 10, 1967 (gage height, 7.74 ft), on basis of contracted-opening measurement of peak flow; minimum, 1.2 cfs Sept. 8-14, 1966; minimum daily, 1.2 cfs Sept. 9, 10, 12, 13, 1966.

Remarks.--Slight diurnal fluctuation at low flow caused by powerplant above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,480	2,310	2,960	3,900	(4,710)	(5,600)
Daily flow	677	1,020	1,290	1,680	-	-
3-day flow	334	465	562	696	-	-
7-day flow	181	258	321	414	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1949, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	4.7	2.8	2.1	1.6	-
14-day	5.0	3.0	2.3	1.8	-
30-day	5.7	3.4	2.6	2.1	-
60-day	7.2	4.4	3.5	2.9	-
90-day	8.9	5.2	4.0	3.2	-
120-day	10	6.3	4.8	3.8	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
520	350	230	110	51	31	25	16	10	7.8	5.2	4.0	3.1	2.6	2.3	1.4

1-5785. Octoraro Creek near Rising Sun, Md.

Location.--Lat 39°41'27", long 76°07'38", on right bank 10 ft downstream from Porter Bridge, 300 ft downstream from Love Run, 3 1/2 miles upstream from mouth, and 3 1/2 miles west of Rising Sun, Cecil County.

Drainage area.--193 sq mi.

Records available.--April 1932 to September 1958. Annual maximum for water years 1963-67.

Gage.--Water-stage recorder. Datum of gage is 73.77 ft above mean sea level, adjustment of 1912. Prior to May 19, 1946, wire-weight gage at bridge 10 ft upstream at same datum.

Average discharge.--25 years (1932-35, 1936-58), 253 cfs (adjusted for storage and diversion since October 1951).

Extremes.--Maximum discharge, 35,000 cfs Aug. 9, 1942 (gage height, 17.57 ft), from rating curve extended above 5,000 cfs on basis of velocity-area studies; minimum, 18 cfs July 30, 31, Aug. 2, 1954; minimum daily, 22 cfs Aug. 2, 1954.
Floods of 1884 and 1918 reached stages of 24.3 and 16.5 ft, respectively, from floodmarks.

Remarks.--Slight diurnal fluctuation caused by mills above station. Flow regulated by Pine Grove Reservoir beginning Feb. 22, 1951 (capacity, 2,800,000,000 gal). Diversion above station by Octoraro Water Co., and from Pine Grove Reservoir beginning November 1951 by Chester Municipal Authority for municipal supply of Chester and surrounding boroughs.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1932, to Sept. 30, 1950)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	4,600	9,300	14,800	26,000	40,000	(62,000)
Daily flow	2,840	5,660	8,680	14,500	-	-
3-day flow	1,480	2,680	3,940	6,330	-	-
7-day flow	930	1,540	2,120	3,120	-	-

*Based on water years 1932-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1933, to Mar. 31, 1950)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	92	67	55	-	-
14-day	97	70	57	-	-
30-day	107	78	64	-	-
60-day	125	91	75	-	-
90-day	138	99	81	-	-
120-day	150	110	91	-	-

1-5785. Octoraro Creek near Rising Sun, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1950)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,750	1,400	980	600	420	300	250	185	145	122	97	76	63	52	47	39

(Based on regulated period Oct. 1, 1951, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
2,100	1,350	1,000	640	450	330	240	155	105	75	47	40	35	32	30	25

SUSQUEHANNA RIVER BASIN

1-5790. Basin Run at Liberty Grove, Md.

Location.--Lat 39°39'30", long 76°06'10", on left bank 100 ft upstream from highway bridge, 0.9 mile east of Liberty Grove, Cecil County, and 3 miles upstream from mouth.

Drainage area.--5.31 sq mi.

Records available.--October 1948 to December 1958. Annual maximum for water years 1965-67.

Gage.--Water-stage recorder and concrete control October 1948 to December 1958. Crest-stage gage during water years 1965-67. Altitude of gage is 220 ft (from topographic map).

Average discharge.--10 years, (1948-58) 6.74 cfs.

Extremes.--Maximum discharge, 2,400 cfs Aug. 9, 1967 (gage height, 7.66 ft); from rating curve extended above 150 cfs on basis of slope-area measurements at gage heights 3.80 ft and 6.06 ft; minimum 0.02 cfs Aug. 3, 1955 (gage height, 0.69 ft); minimum daily, 0.5 cfs Sept. 5, 1957.

Remarks.--Occasional diversions for irrigation of about 60 acres above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1958)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	571	955	1,250	1,680	(2,030)	(2,410)
Daily flow	95	132	160	-	-	-
3-day flow	47	58	64	-	-	-
7-day flow	25	37	47	-	-	-

*Based on water years 1949-66

Magnitude and frequency of annual low flow

(Based on correlation with 1-4950 Big Elk Creek at Elk Mills, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.7	1.1	0.8	0.6	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
74	57	36	18	12	7.9	6.2	4.4	3.1	2.6	2.1	1.7	1.4	1.2	1.0	0.7

SUSQUEHANNA RIVER BASIN

1-5800. Deer Creek at Rocks, Md.

Location.--Lat 39°37'49", long 76°24'13", on right bank 0.25 mile upstream from bridge on Cherry Hill Road, 0.75 mile southeast of Rocks, Harford County, 1.2 miles upstream from Stirrup Run, and 23.5 miles upstream from mouth.

Drainage area.--94.4 sq mi.

Records available.--October 1926 to September 1967. Monthly discharge only for November and December 1926, published in WSP 1302.

Gage.--Digital water-stage recorder. Concrete control since Sept. 7, 1938. Datum of gage is 250.40 ft above mean sea level (city of Baltimore bench mark). Prior to Oct. 1, 1962, graphic water-stage recorder at same site and datum.

Average discharge.--41 years, 118 cfs.

Extremes.--1926-67: Maximum discharge, 13,600 cfs Aug. 23, 1933 (gage height, 17.7 ft from floodmarks), from rating curve extended above 3,000 cfs on basis of slope-area measurements at gage heights 13.3 and 17.7 ft; minimum, 8 cfs Dec. 16, 1930, Jan. 26, 1939, result of regulation; minimum daily, 8.6 cfs Sept. 11, 12, 1966.
Maximum stage known since at least 1888, that of Aug. 23, 1933.

Remarks.--Some regulation at low flow by mills above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1926, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	3,540	5,310	6,830	9,230	11,400	(14,000)
Daily flow	1,280	1,860	2,270	2,820	3,240	-
3-day flow	701	1,010	1,220	1,500	1,700	-
7-day flow	446	617	725	854	946	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1927, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	46	31	24	19	14
14-day	48	33	25	20	15
30-day	51	35	28	23	18
60-day	58	40	32	27	21
90-day	63	44	35	29	23
120-day	68	48	39	33	26

Duration of daily flow

(Based on period Oct. 1, 1926, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
910	630	440	270	200	145	122	90	67	56	44	36	30	26	22	13

BUSH RIVER BASIN

1-5810. Bynum Run near Bel Air, Md.

Location.--Lat 39°32'51", long 76°19'44", on left bank at downstream side of bridge, just upstream from small tributary, 0.5 mile upstream from gaging station 1-5815, Bynum Run at Bel Air, and 1.4 miles northeast of Bel Air, Harford Co. Records include flow of small tributary.

Drainage area.--7.7 sq mi, approximately.

Records available.--October 1950 to September 1955.

Gage.--Water-stage recorder. Altitude of gage is 265 ft (from topographic map).

Average discharge.--5 years (1950-55), 12.7 cfs.

Extremes.--1950-55: Maximum discharge, 2,190 cfs July 4, 1951, Nov. 21, 1952 (gage height, 7.15 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; minimum, 0.2 cfs Sept. 14, 15, 1954.

Remarks.--Records prior to April 1955 do not include a small diversion above station for municipal supply of Bel Air. Pumping plant put on standby basis in April 1955.

Magnitude and frequency of annual low flow

(Based on correlation with 1-5815 Bynum Run at Bel Air, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.9	0.4	0.2	0.2	-

Duration of daily flow

(Based on period Oct. 1, 1950, to Sept. 30, 1955)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
300	180	98	38	20	12	8.8	4.7	2.7	1.8	1.1	0.7	0.5	0.4	0.4	0.3

BUSH RIVER BASIN

1-5815. Bynum Run at Bel Air, Md.

Location.--Lat 39°32'30", long 76°19'50", on right bank 30 ft downstream from bridge on State Highway 22, 1.0 mile east of Bel Air, Harford County, and 8.5 miles upstream from mouth.

Drainage area.--8.52 sq mi.

Records available.--June 1944 to April 1951, July 1955 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 251.94 ft above mean sea level (Maryland State Roads Commission bench mark). Prior to Jan. 21, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--18 years (1944-50, 1955-67), 10.4 cfs.

Extremes.--1944-51, 1955-67: Maximum discharge, 3,620 cfs July 19, 1945 (gage height, 6.25 ft), from rating curve extended above 560 cfs on basis of contracted-opening measurement at gage height 6.18 ft; no flow for part of each day Sept. 8-10, 1966; minimum daily, 0.1 cfs Sept. 4, 5, 7-12, 1966.

Remarks.--Prior to April 1955, small diversion above station for municipal supply of Bel Air; no diversion since April 1955, when pumping plant was put on standby basis.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1944, to Sept. 30, 1950, and Oct. 1, 1955, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	998	1,660	2,270	3,270	(4,230)	(5,410)
Daily flow	279	386	459	551	-	-
3-day flow	119	168	206	261	-	-
7-day flow	63	86	105	132	-	-

*Based on water years 1945-50, 1955-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1945, to Mar. 31, 1950, and Apr. 1, 1956, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.1	0.5	0.3	0.2	-
14-day	1.3	.6	.4	.2	-
30-day	1.6	1.0	.8	.6	-
60-day	2.2	1.3	.9	.7	-
90-day	2.8	1.6	1.2	1.0	-
120-day	3.6	2.1	1.6	1.3	-

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1950, and Oct. 1, 1955, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
170	110	71	35	19	11	7.6	4.8	3.1	2.4	1.7	1.1	0.7	0.6	0.4	0.2

GUNPOWDER RIVER BASIN

1-5820. Little Falls at Blue Mount, Md.

Location.--Lat 39°36'16", long 76°37'16", on left bank at downstream side of Pennsylvania Railroad bridge, 0.2 mile north of Blue Mount, Baltimore County, and 0.6 mile upstream from mouth.

Drainage area.--52.9 sq mi.

Records available.--June 1944 to September 1967.

Gage.--Digital water-stage recorder. Altitude of gage is 305 ft (from topographic map). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--23 years, 63.6 cfs.

Extremes.--1944-67: Maximum discharge, 5,730 cfs Sept. 10, 1950 (gage height, 11.93 ft in gage well, 13.32 ft from floodmark), from rating curve extended above 1,300 cfs on basis of contracted-opening measurement of peak flow; minimum, 1.9 cfs Aug. 29, 1966 (gage height, 0.19 ft); minimum daily, 4.5 cfs Sept. 11, 1966.
Flood in August 1933 reached a stage of about 14 ft, from information by Pennsylvania Railroad.

Remarks.--Slight diurnal fluctuation at low flow caused by mill above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,310	3,330	4,080	5,100	(5,930)	(6,820)
Daily flow	699	921	1,020	1,300	-	-
3-day flow	354	470	528	585	-	-
7-day flow	226	296	331	366	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1945, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	24	16	12	8.6	-
14-day	26	17	12	9.3	-
30-day	28	19	14	11	-
60-day	32	22	17	14	-
90-day	34	24	19	16	-
120-day	36	25	21	18	-

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
450	300	210	145	110	83	68	49	37	31	24	20	17	15	10	5.2

GUNPOWDER RIVER BASIN

1-5830. Slade Run near Glyndon, Md.

Location.--Lat 39°29'40", long 76°47'45", on left bank at downstream side of bridge on Longenecker Road, 1.1 miles upstream from mouth, and 1.6 miles northeast of Glyndon, Baltimore County.

Drainage area.--2.09 sq mi.

Records available.--September 1947 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 420 ft (from topographic map). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 2.14 cfs.

Extremes.--1947-67: Maximum discharge, 485 cfs July 21, 1956 (gage height, 4.68 ft), from rating curve extended above 92 cfs by logarithmic plotting; no flow many days in August and September 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	149	221	290	409	(526)	(673)
Daily flow	26	41	50	61	-	-
3-day flow	13	20	25	31	-	-
7-day flow	8.1	12	14	17	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.7	0.4	0.2	0.2	-
14-day	.7	.4	.3	.2	-
30-day	.8	.4	.3	.2	-
60-day	1.0	.5	.3	.2	-
90-day	1.2	.6	.4	.3	-
120-day	1.3	.8	.6	.5	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
19	13	7.8	5.0	3.8	2.8	2.3	1.6	1.2	1.0	0.8	0.6	0.4	0.3	0.2	0

GUNPOWDER RIVER BASIN

1-5835. Western Run at Western Run, Md.

Location.--Lat 39°30'38", long 76°40'37", on right bank 100 ft downstream from bridge on Western Run Road, 0.3 mile southeast of Western Run, Baltimore County, 3.2 miles upstream from Beaverdam Run, and 5 miles upstream from mouth.

Drainage area.--59.8 sq mi.

Records available.--September 1944 to September 1967.

Gage.--Digital water-stage recorder. Altitude of gage is 260 ft (from topographic map). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--23 years, 62.6 cfs.

Extremes.--1944-67: Maximum discharge, 5,590 cfs July 21, 1956 (gage height, 10.84 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 8.55 and 9.88 ft; minimum 2.4 cfs Sept. 12, 1966 (gage height, 0.41 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,110	3,530	4,620	6,160	(7,410)	(8,760)
Daily flow	669	1,100	1,410	1,840	-	-
3-day flow	371	550	671	825	-	-
7-day flow	234	331	392	465	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1945, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	22	13	9.3	6.7	-
14-day	23	14	10	7.3	-
30-day	25	16	12	9.0	-
60-day	29	19	14	11	-
90-day	31	20	16	13	-
120-day	34	22	18	15	-

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
440	310	220	140	110	82	66	48	35	29	22	18	14	12	8.8	4.7

1-5840. Gunpowder Falls near Carney, Md.

Location.--Lat 39°25'28", long 76°30'42", on left bank 1 mile downstream from Cowen Run, 2 miles north of Carney, Baltimore County, and 2 3/4 miles downstream from Loch Raven Dam.

Drainage area.--314 sq mi.

Records available.--September 1949 to June 1964.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 135 ft (from topographic map).

Extremes.--1949-64: Maximum discharge, 7,000 cfs July 9, 1952 (gage height, 9.50 ft), from rating curve extended above 2,800 cfs by logarithmic plotting; minimum, 1.2 cfs Sept. 7, 1954.

Remarks.--Figures of discharge do not include water diverted at Loch Raven Dam for municipal supply of Baltimore and occasional small diversions just below Loch Raven Dam to maintain Lake Montebello at capacity. Flow completely regulated by Prettyboy and Loch Raven Reservoirs (combined usable capacity, 43,270,000,000 gal; dead storage, 300,000,000 gal).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1949, to Sept. 30, 1963)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	-	-	-	-	-	-
Daily flow	2,050	3,370	4,120	4,910	-	-
3-day flow	1,450	2,330	2,840	3,400	-	-
7-day flow	923	1,480	1,810	2,170	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1950, to Mar. 31, 1964)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.7	2.6	2.2	-	-
14-day	4.0	2.8	2.3	-	-
30-day	4.3	2.8	2.5	-	-
60-day	5.4	3.5	3.1	-	-
90-day	8.5	4.1	3.4	-	-
120-day	12	5.4	3.6	-	-

Duration of daily flow

(Based on period Oct. 1, 1949, to Sept. 30, 1963)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,800	1,300	940	600	410	240	140	25	7.1	5.5	4.3	3.5	2.7	2.3	1.8	1.4

1-5845. Little Gunpowder Falls at Laurel Brook, Md.

Location.--Lat 39°30'18", long 76°25'56", on right bank 700 ft upstream from Laurel Brook, 0.4 mile southwest of Laurel Brook railroad station, Harford County, 1 mile downstream from Maryland and Pennsylvania Railroad bridge, and 10 1/2 miles upstream from mouth.

Drainage area.--36.1 sq mi.

Records available.--October 1926 to September 1967. Monthly discharge only for some periods, published in WSP 1302.

Gage.--Digital water-stage recorder. Datum of gage is 261.43 ft above mean sea level (city of Baltimore bench mark). Prior to Oct. 1, 1963, graphic water-stage recorder at same site and datum.

Average discharge.--41 years, 45.2 cfs.

Extremes.--1926-67: Maximum discharge, 9,200 cfs Aug. 23, 1933 (gage height, 10.3 ft), from rating curve extended above 2,300 cfs on basis of slope-area measurement of peak flow; minimum daily, 3.0 cfs Sept. 7-11, 1966 (during period of no gage-height record).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1927, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	2,360	3,910	5,120	6,880	8,340	(9,930)
Daily flow	609	1,030	1,390	1,950	2,450	-
3-day flow	296	490	654	908	1,140	-
7-day flow	174	272	350	465	564	-

*Based on water years 1927-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1927, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	15	9.9	7.6	5.9	-
14-day	16	11	8.1	6.3	-
30-day	18	12	9.1	7.3	-
60-day	22	13	10	8.0	-
90-day	23	15	12	8.7	-
120-day	25	17	13	11	-

Duration of daily flow

(Based on period Oct. 1, 1927, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
440	270	180	103	74	54	44	33	25	21	16	12	8.9	7.4	6.3	4.5

GUNPOWDER RIVER BASIN

1-5851. Whitemarsh Run at White Marsh, Md.

Location.--Lat 39°22'15", long 76°26'46", on left bank at upstream side of bridge on State Highway 7, 1 mile southwest of White Marsh, Baltimore County, and 3 miles upstream from mouth.

Drainage area.--7.61 sq mi.

Records available.--February 1959 to September 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 40 ft (from topographic map).

Average discharge.--8 years, 8.95 cfs.

Extremes.--1959-67: Maximum discharge 1,780 cfs Sept. 12, 1960 (gage height, 6.60 ft) from rating curve extended above 600 cfs on basis of peak flow through culvert study; no flow Mar. 20, 1965, result of regulation caused by construction work above station; minimum daily, 0.1 cfs Sept. 11, 1966.

Remarks.--Low flow affected by operations of sand and gravel plant in vicinity of gage.

Magnitude and frequency of annual low flow

(Based on correlation with 1-5900 North River near Annapolis, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.5	0.8	0.5	-	-

Duration of daily flow

(Based on period Oct. 1, 1959, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
150	100	66	33	17	8.4	6.0	3.6	2.4	1.9	1.4	1.1	0.7	0.6	0.4	0.3

BACK RIVER BASIN

1-5852. West Branch Herring Run at Idlewylde, Md.

Location.--Lat 39°22'25", long 76°35'35", on left bank at downstream side of highway bridge on Regester Avenue 0.1 mile north of Baltimore city limits, 1 mile upstream from mouth, and 1.3 miles east of U.S. Highway 111 in Idlewylde, Baltimore County.

Drainage area.--2.13 sq mi.

Records available.--July 1957 to May 1965, January 1966 to September 1967.

Gage.--Water-stage recorder and V-notch concrete control. Prior to May 31, 1965, at site 40 ft upstream at datum 3.24 ft higher. Altitude of gage is 285 ft (from topographic map).

Average discharge.--8 years (1958-1964, 1967), 2.23 cfs.

Extremes.--1957-67: Maximum discharge, 1,540 cfs Aug. 27, 1967 (gage height, 6.46 ft), from rating curve extended above 90 cfs on basis of slope-area measurement at gage-height 6.37 ft; no flow Aug. 14-24, 1957.

Remarks.--Slight diurnal fluctuation (occasionally extensive) caused by ready-mixed concrete plant above station.

Magnitude and frequency of annual low flow

(Based on correlation with 1-5830 Slade Run near Glyndon, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.6	0.3	0.2	0.2	-

Duration of daily flow

(Based on period Oct. 1, 1957, to Sept. 30, 1964, and Oct. 1, 1966, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
28	22	15	8.2	4.2	2.4	1.8	1.1	0.8	0.7	0.5	0.4	0.4	0.3	0.2	0.2

1-5853. Stemmers Run at Rossville, Md.

Location.--Lat 39°20'20", long 76°29'15", on left bank at downstream side of bridge on State Highway 7 at Rossville, Baltimore County, 0.8 mile upstream from Brien Run, and 2 miles upstream from mouth.

Drainage area.--4.94 sq mi.

Records available.--December 1958 to September 1967.

Gage.--Water-stage recorder and concrete control. Nov. 4, 1963, to Oct. 3, 1966, digital water-stage recorder at same site and datum. Altitude of gage is 20 ft (from topographic map).

Average discharge.--8 years, 5.94 cfs.

Extremes.--1959-67: Maximum discharge, 1,720 cfs Aug. 4, 1965 (gage height, 7.86 ft), from rating curve extended above 500 cfs on basis of contracted-opening measurement of peak flow; minimum daily, 0.1 cfs many days in 1962, 1964, and 1966.

Remarks.--Slight regulation at low flow from unknown source above station.

Magnitude and frequency of annual low flow

(Based on correlation with 1-5935 Little Patuxent River at Guilford, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.6	0.2	0.1	0.1	-

Duration of daily flow

(Based on period Oct. 1, 1959, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
110	78	54	25	11	4.4	3.1	1.8	1.2	0.8	0.6	0.4	0.2	0.2	0.1	0.1

BACK RIVER BASIN

1-5854. Brien Run at Stemmers Run, Md.

Location.--Lat 39°20'01", long 76°28'23", on right bank a quarter of a mile upstream from mouth and 0.3 mile north of Stemmers Run, Baltimore County.

Drainage area.--1.97 sq mi.

Records available.--May 1958 to September 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map).

Average discharge.--9 years, 2.05 cfs.

Extremes.--1958-67: Maximum discharge, 506 cfs Sept. 12, 1960 (gage height, 5.03 ft); from rating curve extended above 180 cfs on basis of logarithmic plotting and velocity-area study; no flow at times many years.

Magnitude and frequency of annual low flow

(Based on correlation with 1-5935 Little Patuxent River at Guilford, Md.

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.4	0.2	0.1	0	0

Duration of daily flow

(Based on period Oct. 1, 1958, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
35	26	19	9.3	3.7	1.4	0.9	0.7	0.5	0.5	0.4	0.3	0.2	0.1	0	0

1-5855. Cranberry Branch near Westminster, Md.

Location.--Lat 39°35'35", long 76°58'05", on left bank 80 ft upstream from bridge, 0.7 mile upstream from mouth, and 1.8 miles northeast of Westminster, Carroll County.

Drainage area.--3.29 sq mi.

Records available.--September 1949 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 670 ft (from topographic map). Prior to Apr. 7, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--18 years, 3.30 cfs (unadjusted for storage).

Extremes.--1949-67: Maximum discharge, 720 cfs July 4, 1951 (gage height, 5.14 ft, from high-water mark in well), from rating curve extended above 200 cfs; minimum daily 0.3 cfs Sept. 16, 1966.
Flood of July 12, 1949, reached a stage of 5.2 ft, from floodmarks (discharge, 750 cfs).

Remarks.--Flow regulated occasionally by Cranberry Reservoir, 1 mile above station, since August 1957 (capacity, 113,700,000 gal).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	152	293	440	716	(1,010)	(1,410)
Daily flow	36	52	62	-	-	-
3-day flow	R19	R28	R36	-	-	-
7-day flow	R12	R18	R24	-	-	-

R - Affected by regulation

Magnitude and frequency of annual low flow

(Based on correlation with 1-5860 North Branch Patapsco River at Cedarhurst, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.2	0.8	0.7	0.6	-

Duration of daily flow

(Based on period Oct. 1, 1949, to Sept. 30, 1957)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
32	24	16	9.4	6.6	5.1	4.1	2.9	2.2	2.0	1.6	1.3	1.1	1.1	1.0	0.8

(Based on regulated period Oct. 1, 1957, to Sept. 30, 1966)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
23	18	12	6.9	4.9	3.3	2.7	2.1	1.6	1.4	1.2	1.0	0.9	0.8	0.6	0.5

PATAPSCO RIVER BASIN

1-5860. North Branch Patapsco River at Cedarhurst, Md.

Location.--Lat 39°30'00", long 76°53'00", on left bank at downstream side of footbridge at Cedarhurst, Carroll County, 0.8 mile downstream from Roaring Run, and 16 1/2 miles upstream from mouth.

Drainage area.--56.6 sq mi.

Records available.--September 1945 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 425 ft (from topographic map). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--22 years, 59.1 cfs.

Extremes.--1945-67: Maximum discharge, 4,130 cfs Aug. 13, 1955 (gage height, 10.38 ft), from rating curve extended above 1,700 cfs by logarithmic plotting; minimum, 1.9 cfs Sept. 10, 1966, result of filling pond above station; minimum daily, 3.1 cfs Sept. 10, 12, 1966.

Remarks.--Slight diurnal fluctuation at low and medium flow caused by mill above station. Low flow affected slightly by Cranberry Reservoir since August 1957 (capacity, 113,700,000 gal). Records do not include a mean discharge of 1.41 cfs diverted above station for municipal supply of Westminster; sewage effluent discharged into Little Pipe Creek.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1945, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,040	2,830	3,340	3,960	(4,410)	(4,840)
Daily flow	725	1,110	1,380	1,730	-	-
3-day flow	405	579	689	820	-	-
7-day flow	253	347	402	466	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1946, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	17	10	7.6	5.7	-
14-day	18	11	8.2	6.2	-
30-day	20	13	9.6	7.5	-
60-day	23	15	12	9.1	-
90-day	26	17	14	11	-
120-day	29	20	16	14	-

Duration of daily flow

(Based on period Oct. 1, 1945, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
530	370	250	150	110	77	60	41	29	24	18	14	R_{11}	$R_{9.6}$	$R_{7.0}$	$R_{3.7}$

R - Affected by regulation

PATAPSCO RIVER BASIN

1-5865. North Branch Patapsco River near Reisterstown, Md.

Location.--Lat 39°26'31", long 76°53'14", on left bank at upstream side of highway bridge on Louisville-Delight road, 600 ft upstream from Cooks Branch and 3 1/2 miles southwest of Reisterstown, Baltimore County.

Drainage area.--91.0 sq mi.

Records available.--June 1927 to December 1953.

Gage.--Water-stage recorder and concrete control. Datum of gage is 344.35 ft above mean sea level, adjustment of 1912.

Average discharge.--26 years, 103 cfs.

Extremes.--Maximum discharge, 11,000 cfs Aug. 24, 1933 (gage height, 14.6 ft), from rating curve extended above 2,400 cfs; minimum, 8.0 cfs Feb. 21, 1947 (gage height, 1.34 ft); minimum daily, 11 cfs Aug. 9, 1931, Aug. 28, 29, 1932.

Remarks.--Slight diurnal fluctuation at low and medium flow caused by mill above station. Records do not include a mean discharge of 0.70 cfs diverted above station for municipal supply of Westminster; sewage effluent discharged into Little Pipe Creek.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1927, to Sept. 30, 1953)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,520	4,160	5,570	7,800	9,820	(12,200)
Daily flow	1,200	1,890	2,380	3,050	3,570	-
3-day flow	704	1,080	1,330	1,640	1,860	-
7-day flow	431	617	733	869	964	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1928, to Mar. 31, 1953)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	31	19	15	12	-
14-day	33	21	16	13	-
30-day	37	23	18	14	-
60-day	42	28	22	17	-
90-day	49	31	24	18	-
120-day	53	37	29	24	-

Duration of daily flow

(Based on period Oct. 1, 1927, to Sept. 30, 1953)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
820	600	400	250	180	130	110	76	55	44	33	26	20	17	15	13

PATAPSCO RIVER BASIN

1-5870. North Branch Patapsco River near Marriottsville, Md.

Location.--Lat 39°21'56", long 76°53'06", on left bank at downstream side of highway bridge, 0.9 mile downstream from Liberty Dam, 1.2 miles northeast of Marriottsville, Howard County, and 2.3 miles upstream from confluence with South Branch.

Drainage area.--165 sq mi.

Records available.--October 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 269.78 ft above mean sea level (city of Baltimore bench mark).

Extremes.--1929-60: Maximum discharge, 19,500 cfs Aug. 24, 1933 (gage height, 20.8 ft, from high-water mark in gage house), from rating curve extended above 2,700 cfs on basis of slope-area measurement at gage height 13.93 ft and velocity-area study of peak flow; minimum, 0.2 cfs many days in September, October 1954, November 1957, January, September, October 1959.

Remarks.--Flow regulated by Liberty Reservoir beginning July 22, 1954 (usable capacity, 42,070,000,000 gal; dead storage, 1,260,000,000 gal). Diversion above station for municipal supply of Westminster (sewage effluent discharged into Little Pipe Creek) and from Liberty Reservoir beginning Feb. 26, 1953, for municipal supply of Baltimore.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1929, to Sept. 30, 1952)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	3,610	6,310	8,800	13,000	(17,000)	(21,800)
Daily flow	1,920	3,180	4,150	5,550	-	-
3-day flow	1,140	1,800	2,260	2,870	-	-
7-day flow	729	1,050	1,270	1,540	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1930, to Mar. 31, 1952)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	52	32	23	17	-
14-day	54	34	25	19	-
30-day	65	40	30	23	-
60-day	77	49	37	29	-
90-day	87	52	40	30	-
120-day	90	62	50	41	-

1-5870. North Branch Patapsco River near Marriottsville, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1929, to Sept. 30, 1952)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,300	960	680	430	310	230	190	135	94	76	56	43	33	29	26	21

(Based on regulated period Oct. 1, 1953, to Sept. 30, 1960)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
760	540	380	250	170	90	26	1.0	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2

1-5875. South Branch Patapsco River at Henryton, Md.

Location.--Lat 39°21'05", long 76°54'50", on right bank at downstream side of bridge on State Highway 101 at Henryton, Carroll County, 1.3 miles upstream from Piney Run, and 2.5 miles upstream from confluence with North Branch.

Drainage area.--64.4 sq mi.

Records available.--August 1948 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 289.15 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--19 years, 64.7 cfs.

Extremes.--1948-67: Maximum discharge, 12,100 cfs July 21, 1956 (gage height, 19.40 ft), from rating curve extended above 1,900 cfs on basis of contracted-opening measurement of peak flow; minimum, 0.4 cfs Sept. 9-12, 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,270	3,700	4,900	6,700	(8,600)	(12,600)
Daily flow	844	1,460	2,000	2,840	-	-
3-day flow	442	705	926	1,270	-	-
7-day flow	282	429	537	687	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1949, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	14	6.0	3.7	2.1	-
14-day	15	7.3	4.8	3.0	-
30-day	16	9.2	6.9	5.3	-
60-day	21	13	9.9	7.8	-
90-day	24	15	12	9.8	-
120-day	27	18	15	13	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
540	360	260	160	120	88	69	43	30	24	17	13	8.9	7.2	6.0	R0.6

R - Affected by regulation

PATAPSCO RIVER BASIN

1-5880. Piney Run near Sykesville, Md.

Location.--Lat 39°22'55", long 76°58'00", on left bank 75 ft downstream from highway bridge 1 1/4 miles north of Sykesville, Carroll County, and 5 1/4 miles upstream from mouth.

Drainage area.--11.4 sq mi.

Records available.--September 1931 to September 1958. Annual maximum for water years 1959-67.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 450 ft (from topographic map).
Prior to July 21, 1956, water-stage recorder at same site and datum, July 22 to Nov. 26, 1956, staff gage and crest stage indicator at same site and datum.

Average discharge.--27 years, 12.9 cfs.

Extremes.--Maximum discharge, 7,380 cfs July 20, 1956 (gage height, 12.0 ft, from flood marks), from rating curve extended above 1,200 cfs on basis of contracted-opening measurement of peak flow; minimum, 0.1 cfs Aug. 17, 1957, result of regulation caused by construction work above station; minimum daily, 1.2 cfs Sept. 17-21, 25, 26, 1932.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1931, to Sept. 30, 1958)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	724	1,380	2,030	3,210	4,410	(5,960)
Daily flow	213	351	452	590	698	-
3-day flow	100	161	208	277	335	-
7-day flow	60	89	109	135	155	-

*Based on water years 1932-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1932, to Mar. 31, 1958)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.5	2.3	1.8	1.5	-
14-day	3.8	2.5	2.0	1.6	-
30-day	4.4	3.0	2.3	1.9	-
60-day	5.2	3.6	2.9	2.4	-
90-day	6.0	4.1	3.3	2.6	-
120-day	6.7	4.7	3.8	3.2	-

Duration of daily flow

(Based on period Oct. 1, 1931, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
125	87	54	32	22	16	13	8.7	6.4	5.2	4.0	3.0	2.3	1.9	1.6	1.4

1-5890. Patapsco River at Hollofield, Md.

Location.--Lat 39°18'36", long 76°47'39", on right bank at downstream side of highway bridge at Hollofield, Howard County, 0.3 mile downstream from Dogwood Run, and 28 miles upstream from mouth.

Drainage area.--285 sq mi.

Records available.--May 1944 to September 1967.

Gage.--Digital water-stage recorder. Altitude of gage is 190 ft (from topographic map). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Extremes.--1944-67: Maximum discharge, 19,000 cfs July 21, 1956 (gage height, 15.88 ft); minimum, 6 cfs Sept. 6, 1944 (gage height, 0.83 ft); minimum daily, 9.6 cfs Aug. 12, 1963.
Flood in August 1933 reached a stage of 19.5 ft, from information by Maryland State Roads Commission.

Remarks.--Flow regulated by Liberty Reservoir beginning July 22, 1954 (usable capacity, 42,070,000,000 gal; dead storage, 1,260,000,000 gal). Diversion above station for municipal supply of Westminster (sewage effluent discharged into Little Pipe Creek) and from Liberty Reservoir beginning Feb. 26, 1953, for municipal supply of Baltimore.

Magnitude and frequency of annual high flow

(Based on regulated period Oct. 1, 1953, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,800	5,300	10,000	-	-	-
Daily flow	1,300	2,600	5,100	-	-	-
3-day flow	790	1,500	2,500	-	-	-
7-day flow	510	970	1,500	-	-	-

Magnitude and frequency of annual low flow

(Based on correlation with 1-5870 North Branch Patapsco River near Marriottsville, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	83	50	35	-	-

(Based on regulated period Apr. 1, 1953, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	22	16	14	-	-
14-day	24	18	16	-	-
30-day	28	20	18	-	-
60-day	34	24	20	-	-
90-day	40	27	23	-	-
120-day	47	31	27	-	-

1-5890. Patapsco River at Hollofield, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1952)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
2,400	1,900	1,400	840	610	450	360	250	190	160	130	110	96	88	82	73

(Based on regulated period Oct. 1, 1953, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,150	890	600	390	260	160	120	76	52	41	29	24	20	17	15	13

PATAPSCO RIVER BASIN

1-5891. East Branch Herbert Run at Arbutus, Md.

Location.--Lat 39°14'24", long 76°41'33", on right bank at downstream side of highway bridge on Tom Day Boulevard at U.S. Route 1 in Arbutus, Baltimore County, and 1/2 mile upstream from mouth.

Drainage area.--2.47 sq mi.

Records available.--August 1957 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 45 ft (from topographic map). Prior to Oct. 1, 1965, graphic water-stage recorder at same site and datum.

Average discharge.--10 years, 2.86 cfs.

Extremes.--1958-67: Maximum discharge, 824 cfs July 12, 1958 (gage height, 4.83 ft); minimum daily, 0.3 cfs July 24, Sept. 4, 11, 1966.
Flood of July 20, 1956, reached a stage of 5.7 ft from flood marks (discharge 1,090 cfs from rating curve extended above 250 cfs on basis of slope-area measurement of peak flow).

Remarks.--Slight regulation at low flow from unknown source above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	490	678	831	(1,060)	(1,260)	(1,490)
Daily flow	48	77	110	-	-	-
3-day flow	21	35	49	-	-	-
7-day flow	12	19	26	-	-	-

*Based on water years 1956-67

Magnitude and frequency of annual low flow

(Based on correlation with 1-5935 Little Patuxent River at Guilford, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.9	0.7	0.5	0.4	-

Duration of daily flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
38	27	19	9.2	5.2	2.9	2.1	1.6	1.2	1.1	0.9	0.8	0.6	0.6	0.5	0.4

PATAPSCO RIVER BASIN

1-5892. Gwynns Falls near Owings Mills, Md.

Location.--Lat 39°26'16", long 76°46'57", on left bank at downstream side of bridge on railroad siding, 0.4 mile upstream from small tributary, 1 1/4 miles north of Owings Mills, Baltimore County, and 21 miles upstream from mouth.

Drainage area.--4.90 sq mi.

Records available.--July 1958 to September 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 520 ft (from topographic map).

Average discharge.--9 years, 4.12 cfs.

Extremes.--1958-1967: Maximum discharge, 1,330 cfs Aug. 27, 1967 (gage height, 5.06 ft), from rating curve extended above 100 cfs on basis of contracted-opening measurement of peak flow; minimum daily, 0.5 cfs Sept. 6, 8, 1966.

Remarks.--Occasional diversion from gage pool to nearby fire-control reservoir.

Magnitude and frequency of annual low flow

(Based on correlation with 1-5893 Gwynns Falls at Villa Nova, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.4	1.0	0.8	0.6	-

Duration of daily flow

(Based on period Oct. 1, 1958, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
44	25	18	10	6.6	4.7	4.0	2.8	2.2	2.0	1.6	1.5	1.2	1.1	0.9	0.7

PATAPSCO RIVER BASIN

1-5893. Gwynns Falls at Villa Nova, Md.

Location.--Lat 39°20'45", long 76°44'01", on right bank 300 ft downstream from bridge on Essex Road in Villa Nova, Baltimore County, 1.1 miles west of Baltimore city limits, and 11.5 miles upstream from mouth.

Drainage area.--32.5 sq mi.

Records available.--February 1957 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 361.32 ft above mean sea level (Baltimore County bench mark). Prior to Aug. 27, 1963, water-stage recorder at site 300 ft upstream at same datum.

Average discharge.--10 years, 29.3 cfs.

Extremes.--1957-1967: Maximum discharge, 2,010 cfs Aug. 27, 1967 (gage height, 8.92 ft); minimum, 1.7 cfs Sept. 7-8, 1966 (gage height, 0.50 ft).
Maximum discharge known, 5,270 cfs July 21, 1956 (gage height, 12.6 ft) by contracted-opening measurement.

Remarks.--Slight diurnal fluctuation at times from unknown source above station. Small diversion for irrigation above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	908	1,260	1,640	(2,510)	(3,410)	(4,510)
Daily flow	520	719	829	-	-	-
3-day flow	258	361	414	-	-	-
7-day flow	152	213	247	-	-	-

*Based on water years 1957-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1957, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	6.0	3.8	2.9	-	-
14-day	6.6	4.2	3.2	-	-
30-day	7.6	5.1	4.2	-	-
60-day	9.8	6.9	5.7	-	-
90-day	11	8.0	6.8	-	-
120-day	12	9.5	8.6	-	-

Duration of daily flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
340	230	160	88	53	34	26	17	13	10	7.4	5.9	4.5	3.8	3.0	2.3

PATAPSCO RIVER BASIN

1-5893.3. Dead Run at Franklintown, Md.

Location.--Lat 39°18'40", long 76°43'02", on right bank at downstream side of bridge on Colonial Road at Security Boulevard at Franklintown, Baltimore County, 0.3 mile west of Baltimore city limits, and 2 1/2 miles upstream from mouth.

Drainage area.--5.52 sq mi.

Records available.--October 1959 to September 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 310 ft (from topographic map).

Average discharge.--8 years, 5.95 cfs.

Extremes.--1959-1967: Maximum discharge, 1,180 cfs Jan. 1, 1961 (gage height, 6.16 ft), minimum, 0.1 cfs Sept. 11-12, 1966 (gage height, 0.57 ft).

Remarks.--Occasional regulation at low flow from unknown source above station.

Magnitude and frequency of annual low flow

(Based on correlation with 1-5935 Little Patuxent River at Guilford, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.5	0.3	0.2	-	-

Duration of daily flow

(Based on period Oct. 1, 1959, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
140	98	58	23	9.3	4.0	2.5	1.4	0.9	0.7	0.5	0.4	0.3	0.3	0.3	0.2

1-5895. Sawmill Creek at Glen Burnie, Md.

Location.--Lat 39°10'12", long 76°37'51", on left bank just downstream from unnamed tributary, 300 ft upstream from bridge on State Highway 301 and 0.5 mile northwest of Glen Burnie, Anne Arundel County.

Drainage area.--5.1 sq mi.

Records available.--May 1944 to September 1952. Annual maximum for water years 1965-67.

Gage.--Water-stage recorder and concrete control May 1944 to September 1952. Crest-stage gage during water years 1965-67. Datum of gage is 26.07 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 8.26 cfs.

Extremes.--Maximum discharge, 157 cfs Sept. 1, 1952 (gage height, 4.77 ft), from rating curve extended above 72 cfs on basis of contracted-opening measurement of peak flow; minimum, about 1.1 cfs sometime during period July 14 to Aug. 5, 1949 (gage height, 1.72 ft, from recorded range in stage), result of regulation from unknown source; minimum daily, 3.6 cfs Sept. 7, 8, 1950.
Flood of August 1933 reached a stage of about 4 ft.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1943, to Sept. 30, 1952, and Oct. 1, 1964, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	56	88	113	(147)	(175)	(205)

Magnitude and frequency of annual low flow

(Based on correlation with 1-5935 Little Patuxent River at Guilford, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	4.6	3.6	3.1	-	-

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1952)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
29	23	18	15	12	9.6	8.7	7.5	6.4	6.0	5.4	5.0	4.8	4.7	4.5	3.9

SOUTH RIVER BASIN

1-5900. North River near Annapolis, Md.

Location.--Lat 38°59'09", long 76°37'21", on left bank 500 ft downstream from bridge on State Highway 450, 0.8 mile upstream from mouth, and 7 miles west of Annapolis, Anne Arundel County.

Drainage area.--8.5 sq mi, approximately.

Records available.--December 1931 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map). Prior to Nov. 2, 1933, staff gage at same site and datum. Prior to Oct. 13, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--35 years (1932-67), 10.1 cfs.

Extremes.--1931-67: Maximum discharge, 5,000 cfs Aug. 2, 1944 (gage height, 6.22 ft), from rating curve extended above 260 cfs on basis of velocity-area studies; minimum, 0.90 cfs Sept. 12, 1966 (gage height, 0.78 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	145	238	354	605	910	-
Daily flow	80	139	201	318	444	-
3-day flow	49	80	109	160	211	-
7-day flow	33	49	63	85	105	-

*Based on water years 1932-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1932, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.7	2.6	2.0	1.7	-
14-day	4.0	2.8	2.2	1.8	-
30-day	4.5	3.1	2.6	2.1	-
60-day	5.5	3.7	3.0	2.4	-
90-day	6.0	4.3	3.5	3.0	-
120-day	6.4	4.7	4.0	3.4	-

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
62	47	34	23	18	13	11	8.2	6.2	5.2	4.1	3.2	2.7	2.3	1.9	1.3

SOUTH RIVER BASIN

1-5905. Bacon Ridge Branch at Chesterfield, Md.

Location.--Lat 39°00'07", long 76°36'53", on left bank 50 ft downstream from bridge, 0.5 mile east of Chesterfield, Anne Arundel County, and 1.4 miles upstream from confluence with North River.

Drainage area.--6.92 sq mi.

Records available.--November 1942 to September 1952. Annual maximum for water years 1965-67.

Gage.--Water-stage recorder and concrete control November 1942 to September 1952. Crest-stage gage during water years 1965-67.

Average discharge.--9 years (1943-52), 10.4 cfs.

Extremes.--Maximum discharge, 2,100 cfs Aug. 2, 1944 (gage height, 5.49 ft), from rating curve extended above 140 cfs by velocity-area studies and logarithmic plotting; minimum, 3.0 cfs Aug. 4, 16, 19-27, 1943, July 13, 1944 (gage height, 1.75 ft); minimum daily, 3.0 cfs Aug. 4, 19-26, 1943.

Remarks.--Records include sewage from Crownsville State Hospital, which obtains its water supply from wells.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1943, to Sept. 30, 1952, and Oct. 1, 1964, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	245	423	600	(880)	(1,180)	(1,570)

Magnitude and frequency of annual low flow

(Based on correlation with 1-5900 North River near Annapolis, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.6	3.1	2.7	-	-

Duration of daily flow

(Based on period Oct. 1, 1942, to Sept. 30, 1952)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
81	47	32	21	16	12	10	8.0	6.4	5.6	4.5	3.9	3.6	3.5	3.4	3.2

1-5910. Patuxent River near Unity, Md.

Location.--Lat 39°14'18", long 77°03'23", on right bank at downstream side of bridge on State Highway 97, 0.6 mile upstream from Cattail Creek, 0.8 mile upstream from Triadelphia Reservoir, 1.1 miles northeast of Unity, Montgomery County, and 97 miles upstream from mouth.

Drainage area.--34.8 sq mi.

Records available.--July 1944 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 364.76 ft above mean sea level (Washington Suburban Sanitary Commission bench mark). Prior to Aug. 14, 1946, wire-weight gage and crest-stage gage at same site and datum. Aug. 14, 1946, to Oct. 27, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--23 years, 34.9 cfs.

Extremes.--1944-67: Maximum discharge, 10,700 cfs July 21, 1956 (gage height, 14.35 ft), from rating curve extended above 870 cfs on basis of slope-area measurement at gage height 13.58 ft; minimum, 0.20 cfs Sept. 10, 11, 12, 1966 (gage height, 1.66 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,340	2,880	4,460	7,310	(10,200)	(13,900)
Daily flow	521	926	1,260	1,770	-	-
3-day flow	267	431	557	736	-	-
7-day flow	170	266	335	427	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1945, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	7.3	3.8	3.0	2.2	-
14-day	8.0	4.2	3.5	2.7	-
30-day	8.7	5.0	4.3	3.7	-
60-day	10	6.4	5.5	4.8	-
90-day	12	7.2	6.3	5.6	-
120-day	14	9.3	7.7	6.7	-

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
350	210	140	88	66	47	37	23	16	12	8.2	6.4	4.7	3.8	2.9	1.0

PATUXENT RIVER BASIN

1-5915. Cattail Creek at Roxbury Mills, Md.

Location.--Lat 39°15'17", long 77°02'43", on left bank 0.2 mile downstream from highway bridge, 0.5 mile southeast of Roxbury Mills, Howard County, and 1.3 miles upstream from mouth.

Drainage area.--27.7 sq mi.

Records available.--July 1944 to September 1956.

Gage.--Water-stage recorder. Prior to Oct. 19, 1945, staff gage at same site and datum. Altitude of gage is 370 ft (from topographic map).

Average discharge.--12 years, 28.6 cfs.

Extremes.--Maximum discharge, 10,100 cfs July 21, 1956 (gage height, 14.19 ft), from rating curve extended above 350 cfs on basis of slope area measurement of peak flow; minimum, 2.9 cfs Aug. 26, Sept. 8, 1944 (gage height, 0.76); minimum daily, 3.2 cfs Aug. 3, 1955.

Remarks.--Diurnal fluctuation at low flow caused by mill at Roxbury Mills.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1944, to Sept. 30, 1956)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	787	944	1,180	(1,530)	(1,940)	(2,640)
Daily flow	360	595	778	-	-	-
3-day flow	191	291	359	-	-	-
7-day flow	124	171	194	-	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1945, to Mar. 30, 1956)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	9.1	5.8	4.5	-	-
14-day	9.7	6.3	4.8	-	-
30-day	11	7.2	5.5	-	-
60-day	13	8.8	6.9	-	-
90-day	15	10	8.0	-	-
120-day	17	12	9.2	-	-

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1956)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
230	170	110	70	50	36	29	21	16	13	9.9	8.1	5.6	4.5	4.0	3.5

1-5920. Patuxent River near Burtonsville, Md.

Location.--Lat 39°07'47", long 76°55'04", 150 ft upstream from highway bridge, 1 1/2 miles northeast of Burtonsville, Montgomery County, and 8 miles downstream from Hawlings River.

Drainage area.--127 sq mi.

Records available.--July 1911 to June 1912, July 1913 to February 1945.

Gage.--Water-stage recorder. Datum of gage is 232.79 ft above mean sea level, adjustment of 1912. Prior to July 23, 1914, non-recording gage at site 150 ft downstream at datum 1.29 ft higher. July 23, 1914, to Sept. 30, 1929, water-stage recorder at site 230 ft downstream at present datum.

Average discharge.--31 years (1913-44), 124 cfs (unadjusted).

Extremes.--1911-12, 1913-44: Maximum discharge, 11,000 cfs Aug. 24, 1933 (gage height, 21.7 ft, from floodmarks), from rating curve extended above 4,800 cfs; minimum, 4.6 cfs Oct. 9, 10, 1942; minimum daily, 4.8 cfs Oct. 9, 1941.

Remarks.--Daily discharge does not include diversion by pumping of part of low flow into Anacostia River basin since August 12, 1939. Flow regulated by Triadelphia Lake (capacity 3,380,000,000 gal) since June 27, 1942.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1913, to Sept. 30, 1938)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	2,530	3,920	5,100	6,910	8,530	(10,400)
Daily flow	1,380	2,220	2,940	4,080	5,130	-
3-day flow	851	1,290	1,620	2,120	2,530	-
7-day flow	518	725	866	1,050	1,180	-

*Based on water years 1911-43

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1914, to Mar. 31, 1939)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	35	20	14	9.7	-
14-day	38	22	16	11	-
30-day	46	28	20	14	-
60-day	54	32	24	18	-
90-day	63	37	27	20	-
120-day	72	44	31	23	-

Duration of daily flow

(Based on period Oct. 1, 1913, to Sept. 30, 1938)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,150	820	570	330	220	160	130	96	67	53	38	28	17	11	8.1	6.6

1-5925. Patuxent River near Laurel, Md.

Location.--Lat 39°06'56", long 76°52'27", on right bank at Rocky Gorge Pumping Station, 600 ft downstream from Rocky Gorge Dam, 0.7 mile upstream from Walker Branch, 1.3 miles northwest of Laurel, Prince Georges County, and 81 miles upstream from mouth.

Drainage area.--132 sq mi.

Records available.--October 1944 to September 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 160 ft (from topographic map). Prior to October 1, 1955, water-stage recorder and concrete control at site 0.3 mile downstream at different datum. Oct. 1, 1955, to Sept. 30, 1956, vertical staff gage at present site at datum 1.2 ft lower. Oct. 1, 1956, to Jan. 27, 1957, inclined staff gage at present site and datum.

Extremes.--1944-67: Maximum discharge, 11,800 cfs July 21, 1956 (gage height, 17.7 ft from floodmarks, present site and datum); minimum, 0.1 cfs Sept. 25, 1964 (valve closed for repair); minimum daily, 1.1 cfs June 26, 1956.

Remarks.--Records do not include diversion at Patuxent (formerly Willis School) filtration plant for supply of Washington Suburban Sanitary District. Flow regulated by Triadelphia Reservoir, and since March 1954 by Rocky Gorge Reservoir (combined usable capacity, 12,500,000,000 gal; dead storage, 80,000,000 gal).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1954, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,350	4,900	9,000	-	-	-
Daily flow	500	1,500	2,600	-	-	-
3-day flow	350	710	930	-	-	-
7-day flow	250	470	590	-	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1954, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	9.1	6.7	5.5	-	-
14-day	9.6	7.1	5.8	-	-
30-day	10	7.5	6.1	-	-
60-day	11	8.0	6.5	-	-
90-day	11	8.5	6.8	-	-
120-day	12	9.0	7.2	-	-

1-5925. Patuxent River near Laurel, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1953)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,200	830	610	360	270	190	150	100	64	51	41	34	28	25	23	20

(Based on period Oct. 1, 1954, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
500	320	200	150	113	55	16	13	12	10	8.5	7.5	6.7	5.2	3.9	2.8

1-5935. Little Patuxent River at Guilford, Md.

Location.--Lat 39°10'04", long 76°51'07", on left bank 75 ft upstream from bridge on State Highway 32, 1 mile west of Guilford, Howard County, 3 miles upstream from Middle Patuxent River, and 20.1 miles upstream from mouth.

Drainage area.--38.0 sq mi.

Records available.--April 1932 to September 1967. Monthly discharge only for April 1932, published in WSP 1302.

Gage.--Digital water-stage recorder. Concrete control since June 20, 1946. Altitude of gage is 260 ft (from topographic map). Prior to June 25, 1946, staff gage at same site and datum. June 25, 1946, to Sept. 30, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--35 years, 39.1 cfs.

Extremes.--1932-67: Maximum discharge, 5,300 cfs Sept. 1, 1952 (gage height, 13.26 ft), from rating curve extended above 1,800 cfs on basis of contracted-opening measurement of peak flow; minimum, no flow Sept. 8, and parts of Sept. 6, 7, 9-12, 1966.

Remarks.--Low flow affected by regulation from unknown source.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,250	2,120	2,900	4,170	5,370	(6,820)
Daily flow	661	1,010	1,310	1,740	2,130	-
3-day flow	339	502	626	798	939	-
7-day flow	198	283	344	426	491	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1932, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	9.0	5.1	3.4	2.3	-
14-day	9.2	5.6	4.0	2.9	-
30-day	10	6.0	4.6	3.7	-
60-day	13	8.3	6.5	5.3	-
90-day	15	9.7	7.9	6.6	-
120-day	17	12	9.5	8.1	-

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
450	310	200	100	66	46	37	25	17	14	11	8.0	5.9	4.9	4.1	R 1.9

R - Affected by regulation

1-5940. Little Patuxent River at Savage, Md.

Location.--Lat 39°08'00", long 76°48'58", on left bank 400 ft downstream from bridge on U.S. Highway 1, half a mile southeast of Savage, Howard County, and 1 mile downstream from Middle Patuxent River.

Drainage area.--98.4 sq mi.

Records available.--November 1939 to September 1958. Annual maximum for water years 1959-67.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 125 ft (from topographic map).

Average discharge.--18 years (1940-58), 102 cfs.

Extremes.--Maximum discharge, 6,280 cfs Sept. 1, 1952 (gage height, 13.15 ft); minimum daily, 7.0 cfs Sept. 19, 1943.
Maximum stage known, about 17.5 ft in August 1933, from information by local residents.

Remarks.--Occasional regulation from unknown source above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1939, to Sept. 30, 1958)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	2,960	4,100	4,880	5,890	6,650	(7,440)
Daily flow	1,360	2,070	2,640	3,480	-	-
3-day flow	738	1,140	1,450	1,900	-	-
7-day flow	442	666	838	1,090	-	-

*Based on water years 1940-64

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1940, to Mar. 31, 1958)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	22	15	12	10	-
14-day	24	16	13	11	-
30-day	28	18	15	12	-
60-day	35	23	18	15	-
90-day	41	27	21	18	-
120-day	46	31	25	21	-

Duration of daily flow

(Based on period Oct. 1, 1939, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,030	740	490	270	180	120	98	67	47	38	28	22	16	14	12	9.5

PATUXENT RIVER BASIN

1-5944. Dorsey Run near Jessup, Md.

Location.--Lat 39°07'15", long 76°47'00", on left bank on State Highway 32, 1.0 mile upstream from mouth, and 2 miles south of Jessup, Anne Arundel County.

Drainage area.--11.6 sq mi.

Records available.--July 1948 to September 1958. Annual maximum for water years 1959-67. Prior to October 1951, published as "at Annapolis Junction."

Gage.--Water-stage recorder and concrete control July 1948 to September 1958. Crest-stage gage during water years 1959-67. Altitude of gage is 120 ft (from topographic map).

Average discharge.--10 years, 14.5 cfs.

Extremes.--Maximum discharge, 1,400 cfs Aug. 13, 1955 (gage height, 12.77 ft), from rating curve extended above 390 cfs on basis of contracted-opening measurement at gage height 11.09 ft; minimum, 1.1 cfs Jan. 9, 1956, result of freezeup; minimum daily, 1.4 cfs Aug. 14, 15, 18, 19, 1957.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1962, and Oct. 1, 1963, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	415	665	960	1,540	(2,200)	(3,100)

Magnitude and frequency of annual low flow

(Based on correlation with 1-5935 Little Patuxent River at Guilford, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.6	1.8	1.5	1.2	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
170	130	89	42	26	17	14	8.1	5.3	4.2	3.2	2.6	2.2	2.0	1.9	1.6

PATUXENT RIVER BASIN

1-5945. Western Branch near Largo, Md.

Location.--Lat 38°52'34", long 76°47'54", on right bank 200 ft upstream from culvert on State Highway 202, 200 ft downstream from small tributary, 2.3 miles southeast of Largo, Prince Georges County, and 11 miles upstream from mouth.

Drainage area.--30.2 sq mi.

Records available.--October 1949 to September 1967. Monthly discharge only for some periods, published in WSP 1302.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 46.50 ft above mean sea level (levels by private consultant engineers). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--18 years, 28.1 cfs.

Extremes.--1949-67: Maximum discharge, 1,580 cfs Aug. 13, 1955 (gage height, 8.51 ft from high-water mark in well); minimum, no flow Sept. 8-13, 1966.

Remarks.--Records are affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	802	1,180	1,430	1,740	(1,970)	(2,200)
Daily flow	464	685	835	1,030	-	-
3-day flow	297	419	502	610	-	-
7-day flow	170	239	291	363	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1950, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.9	0.9	0.5	0.3	-
14-day	2.2	1.1	.7	.5	-
30-day	2.7	1.2	.8	.5	-
60-day	5.1	2.4	1.5	1.1	-
90-day	6.9	3.3	2.3	1.7	-
120-day	8.9	4.9	3.5	2.6	-

Duration of daily flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
340	240	160	96	59	36	26	15	7.8	5.2	3.0	2.0	1.3	0.9	0.5	0.1

PATUXENT RIVER BASIN

1-5946. Cocktown Creek near Huntingtown, Md.

Location.--Lat 38°38'27", long 76°38'07", on right bank at downstream side of bridge, 2 miles northwest of Huntingtown, Calvert County, and 3 1/2 miles upstream from mouth.

Drainage area.--3.85 sq mi.

Records available.--December 1956 to September 1967.

Gage.--Water-stage recorder. Altitude of gage is 40 ft (from topographic map).

Average discharge.--10 years (1957-67), 4.13 cfs.

Extremes.--1956-67: Maximum discharge, 1,120 cfs June 14, 1960 (gage height, 7.96 ft) from rating curve extended above 150 cfs on basis of contracted-opening measurement of peak flow; no flow many days in July and August 1957, September 1963, July, August, and September 1964.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	131	336	535	(915)	(1,310)	(1,800)
Daily flow	39	72	103	-	-	-
3-day flow	21	34	45	-	-	-
7-day flow	15	22	27	-	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1957, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.2	0	0	0	0
14-day	.3	0	0	0	0
30-day	.4	.1	.1	-	-
60-day	.5	.2	.1	-	-
90-day	.8	.3	.2	-	-
120-day	1.0	.6	.5	-	-

Duration of daily flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
29	22	18	13	9.0	6.1	4.4	2.8	1.6	1.0	0.5	0.3	0.2	0.1	0	0

PATUXENT RIVER BASIN

1-5948. St. Leonard Creek near St. Leonard, Md.

Location.--Lat 38°26'57", long 76°29'43", on left bank at downstream side of highway bridge, 1 3/4 miles south of St. Leonard, Calvert County, and 5 1/2 miles upstream from mouth.

Drainage area.--6.73 sq mi.

Records available.--December 1956 to September 1967.

Gage.--Water-stage recorder. Timber control since June 13, 1958. Altitude of gage is 5 ft (from topographic map).

Average discharge.--10 years (1957-67), 7.60 cfs.

Extremes.--1956-67: Maximum discharge, 288 cfs July 30, 1960 (gage height, 6.35 ft); no flow at times during summer months of 1963-1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	118	174	220	(289)	(349)	(417)
Daily flow	59	89	115	-	-	-
3-day flow	33	45	54	-	-	-
7-day flow	22	30	35	-	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1957, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.2	0.4	0.2	-	-
14-day	1.5	.6	.3	-	-
30-day	1.8	.8	.6	-	-
60-day	2.2	1.1	.8	-	-
90-day	2.9	1.6	1.3	-	-
120-day	3.3	2.0	1.6	-	-

Duration of daily flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
49	39	30	21	15	10	8.1	5.7	3.7	2.8	1.8	1.2	0.4	0.3	0.1	0

1-5950. North Branch Potomac River at Steyer, Md.

Location.--Lat 39°18'07", long 79°18'26", on left bank 0.3 mile southeast of Steyer, Garrett County, 0.35 mile downstream from Steyer Run, and 81.8 miles upstream from confluence with South Branch.

Drainage area.--73.0 sq mi.

Records available.--July 1956 to September 1967.

Gage.--Digital water-stage recorder. Datum of gage is 2,276.01 ft above mean sea level, datum of 1929, Parkersburg-Uniontown supplementary adjustment of 1944. Prior to Jan. 5, 1967, graphic water-stage recorder at same site and datum.

Average discharge.--11 years, 162 cfs.

Extremes.--1956-67: Maximum discharge, 6,240 cfs Mar. 5, 1963 (gage height, 9.13 ft), from rating curve extended above 3,000 cfs by logarithmic plotting; minimum, 2.9 cfs Sept. 10, 1965 (gage height, 2.03 ft).
Flood of Oct. 15, 1954, reached a stage of 13.0 ft, from floodmarks.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1956, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	3,590	4,820	5,650	(6,700)	(7,490)	(8,290)
Daily flow	2,320	3,210	3,810	-	-	-
3-day flow	1,570	2,090	2,440	-	-	-
7-day flow	1,130	1,410	1,560	-	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1957, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	7.1	4.5	3.5	-	-
14-day	8.6	5.2	3.9	-	-
30-day	10	6.5	5.1	-	-
60-day	15	9.2	7.1	-	-
90-day	19	12	9.7	-	-
120-day	25	16	12	-	-

Duration of daily flow

(Based on period Oct. 1, 1956, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,600	1,300	950	600	390	220	160	78	35	22	12	7.8	5.1	4.3	3.8	3.3

1-5955. North Branch Potomac River at Kitzmiller, Md.

Location.--Lat 39°23'38", long 79°10'55", on left bank 0.6 mile downstream from bridge on State Highway 38 in Kitzmiller, Garrett County, 1.5 miles downstream from Wolfden Run, and 68.9 miles upstream from confluence with South Branch.

Drainage area.--225 sq mi.

Records available.--October 1949 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 1,572.26 ft above mean sea level, datum of 1929, Parkersburg-Uniontown supplementary adjustment of 1944. Prior to Oct. 15, 1954, water-stage recorder at site 0.3 mile upstream at datum 7.58 ft higher. Oct. 15, 1954, to Nov. 20, 1955, wire-weight gage at bridge half a mile upstream at datum 21.51 ft higher.

Average discharge.--18 years, 427 cfs (adjusted for storage).

Extremes.--1949-67: Maximum discharge, 33,400 cfs Oct. 15, 1954 (gage height, 13.73 ft, from floodmarks, present site and datum); minimum, 4.6 cfs Oct. 3-7, 1953.

Remarks.--Regulation at low flow by Stony River Reservoir, 30 miles above station (capacity, 1,948,000,000 gal, of which 1,681,000,000 gal is controlled storage above minimum pool).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	6,380	9,920	13,800	21,100	(29,200)	(40,300)
Daily flow	4,530	6,380	7,970	10,500	-	-
3-day flow	3,390	4,410	5,070	5,870	-	-
7-day flow	2,530	3,140	3,470	3,820	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1950, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	24	14	$R_{9.9}$	$R_{7.6}$	-
14-day	28	16	R_{11}	$R_{8.7}$	-
30-day	38	22	17	R_{13}	-
60-day	48	30	24	20	-
90-day	59	35	28	23	-
120-day	75	45	34	28	-

R - Affected by regulation

Duration of daily flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
3,900	3,000	2,300	1,500	1,000	630	430	230	92	60	37	28	20	16	R_{12}	$R_{5.6}$

R - Affected by regulation

1-5960. North Branch Potomac River at Bloomington, Md.

Location.--Lat 39°28'48", long 79°04'08", at bridge at Bloomington, Garrett County, 600 ft upstream from Savage River.

Drainage area.--287 sq mi.

Records available.--October 1924 to September 1927, July 1929 to September 1950.

Gage.--Water-stage recorder. Datum of gage is 951.98 ft above mean sea level, adjustment of 1912. Prior to Sept. 1, 1929, non-recording gage at same site and datum.

Average discharge.--23 years (1925-27, 1929-50) 498 cfs (unadjusted).

Extremes.--Maximum discharge, 22,500 cfs Mar. 17, 1936, Oct. 28, 1937 (gage height, 14.85 ft), from rating extended above 10,000 cfs on the basis of slope-area measurement of peak flow; minimum, 5.4 cfs Sept. 22, 1932 (gage height, 1.81 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1924, to Sept. 30, 1927, and Oct. 1, 1929, to Sept. 30, 1950)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	8,090	13,700	18,400	25,700	32,200	(39,700)
Daily flow	4,630	7,160	9,450	13,200	-	-
3-day flow	3,530	5,010	6,180	7,900	-	-
7-day flow	2,570	3,350	3,840	4,440	-	-

*Based on water years 1924-27, 1930-50, 1955

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1925, to Mar. 31, 1927, and Apr. 1, 1930, to Mar. 31, 1950)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	39	26	20	16	-
14-day	44	30	24	20	-
30-day	54	36	28	23	-
60-day	80	49	37	29	-
90-day	103	62	47	37	-
120-day	130	78	58	44	-

Duration of daily flow

(Based on period Oct. 1, 1924, to Sept. 30, 1927, and Oct. 1, 1929, to Sept. 30, 1950)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
4,100	3,220	2,500	1,600	1,100	700	520	280	130	86	54	40	31	25	21	R13

R - Affected by regulation

1-5965. Savage River near Barton, Md.

Location.--Lat 39°34'05", long 79°06'10", on right bank 0.9 mile upstream from Bear Pen Run, 5.4 miles northwest of Barton, Allegany County, and 10 miles upstream from mouth.

Drainage area.--49.1 sq mi.

Records available.--September 1948 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 1,605 ft (from topographic map). Prior to Oct. 20, 1960, graphic water-stage recorder at same site and datum.

Average discharge.--19 years, 71.3 cfs.

Extremes.--1948-67: Maximum discharge, 7,510 cfs Oct. 15, 1954 (gage height, 8.45 ft), from rating curve extended above 1,600 cfs on basis of slope-area measurement of peak flow; minimum, 0.40 cfs Sept. 3, 4, 1966 (gage height, 0.96 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,620	2,600	3,500	4,990	(6,410)	(8,140)
Daily flow	1,070	1,400	1,590	1,810	-	-
3-day flow	732	951	1,090	1,250	-	-
7-day flow	481	628	727	855	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1949, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.6	0.9	0.7	0.6	-
14-day	2.0	1.1	.8	.7	-
30-day	2.8	1.8	1.4	1.3	-
60-day	3.8	2.2	1.8	1.6	-
90-day	4.8	2.9	2.4	2.0	-
120-day	6.6	3.9	3.0	2.5	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
830	600	450	280	180	100	67	27	9.3	5.4	3.1	2.1	1.4	1.1	0.9	0.7

1-5970. Crabtree Creek near Swanton, Md.

Location.--Lat 39°30'00", long 79°09'35", on left bank, 1/2 mile upstream from mouth and 5.0 miles northeast of Swanton, Garrett County.

Drainage area.--16.7 sq mi.

Records available.--September 1948 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 1,529.06 ft above mean sea level (Corps of Engineers bench mark). Prior to Dec. 1, 1960, graphic water-stage recorder at same site and datum.

Average discharge.--19 years, 28.2 cfs.

Extremes.--1948-67: Maximum discharge, 3,260 cfs July 12, 1949 (gage height, 5.01 ft), from rating curve extended above 210 cfs on basis of slope-area and contracted-opening measurements of peak flow; minimum, 0.1 cfs Dec. 3, 1953 (gage height, 0.56 ft); minimum daily, 0.8 cfs Nov. 6, 1953.

Remarks.--Small diversion above station by Baltimore and Ohio Railroad.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	442	770	1,130	1,850	(2,650)	(3,780)
Daily flow	361	505	597	709	-	-
3-day flow	269	362	416	476	-	-
7-day flow	185	239	273	312	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1949, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.4	1.0	0.9	0.8	-
14-day	1.6	1.1	1.0	.9	-
30-day	1.8	1.3	1.1	1.0	-
60-day	2.1	1.5	1.2	1.1	-
90-day	2.6	1.8	1.5	1.4	-
120-day	3.2	2.1	1.7	1.5	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
290	230	180	110	70	40	27	12	4.4	2.9	1.9	1.5	1.3	1.2	1.1	1.0

1-5975. Savage River below Savage River Dam, near Bloomington, Md.

Location.--Lat 39°30'05", long 79°07'25", on left bank 0.7 mile downstream from Savage River Dam, 3.2 miles northwest of Bloomington, Garrett County, and 3.7 miles upstream from mouth.

Drainage area.--106 sq mi.

Records available.--October 1948 to September 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,276.40 ft above mean sea level (Corps of Engineers bench mark).

Average discharge.--19 years, 159 cfs (adjusted for storage).

Extremes.--1948-67: Maximum discharge, 6,530 cfs Oct. 16, 1954 (gage height, 7.70 ft); minimum, 0.35 cfs Oct. 27, 1966 (gage height, 0.57 ft); minimum daily, 0.6 cfs July 27-31, Aug. 5, 6, 9, 10, 1951.

Remarks.--Diversions above station by Baltimore & Ohio Railroad and by cities of Frostburg and Westernport for municipal supply. Flow regulated by Savage River Reservoir beginning December 1950 (capacity, 20,000 acre-ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	3,300	4,200	5,000	6,000	-	-
Daily flow	2,370	2,890	3,140	3,380	-	-
3-day flow	1,720	2,210	2,510	2,860	-	-
7-day flow	1,110	1,400	1,580	1,790	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1949, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	10	8.3	7.3	-	-
14-day	12	9.7	9.0	-	-
30-day	18	12	10	-	-
60-day	28	23	15	-	-
90-day	45	30	19	-	-
120-day	50	38	27	-	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,800	1,400	1,040	640	400	160	104	76	44	25	14	11	7.9	7.0	6.2	0.8

1-5980. Savage River at Bloomington, Md.

Location.--Lat 39°29'00", long 79°04'24", on left bank at Bloomington, Garrett County, 2,200 ft upstream from mouth.

Drainage area.--115 sq mi.

Records available.--May 1905 to July 1906, October 1924 to September 1927, August 1929 to September 1950.

Gage.--Water-stage recorder. Datum of gage is 978.76 ft above mean sea level (Corps of Engineers bench mark). Prior to Sept. 6, 1929, non-recording gage at same site and datum. Prior to Sept. 30, 1927, at site 800 ft downstream at different datum.

Average discharge.--24 years (1924-27, 1929-50) 163 cfs.

Extremes.--1905-6, 1924-27, 1929-50: Maximum discharge, 14,800 cfs Mar. 17, 1936 (gage height, 10.8 ft), from rating curve extended above 3,500 cfs on basis of slope-area determinations of peak flow; minimum, 0.7 cfs Sept. 21, 1932, Dec. 16, 1943 (result of freezeup).
Maximum stage known, about 13 ft Mar. 29, 1924, present site and datum (discharge not determined).

Remarks.--Diversions above station by Baltimore & Ohio Railroad and by cities of Frostburg, Piedmont, and Westernport for municipal supply. Some reduction of flood peaks beginning about 1941 and occasional regulation at low flow beginning in 1949 by partly completed Savage River Dam.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1924, to Sept. 30, 1927, and Oct. 1, 1929, to Sept. 30, 1950)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	3,390	5,820	8,070	11,800	(15,400)	(19,800)
Daily flow	2,260	3,590	4,650	6,240	-	-
3-day flow	1,560	2,310	2,890	3,730	-	-
7-day flow	1,030	1,400	1,660	1,980	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1925, to Mar. 30, 1927, and Apr. 1, 1930, to Mar. 30, 1950)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	4.9	2.5	1.7	1.2	-
14-day	6.0	2.9	1.9	1.3	-
30-day	7.7	3.6	2.4	1.6	-
60-day	12	5.8	3.9	2.7	-
90-day	19	9.0	5.9	4.1	-
120-day	25	12	8.1	5.6	-

Duration of daily flow

(Based on period Oct. 1, 1924, to Sept. 30, 1927, and Oct. 1, 1929, to Sept. 30, 1950)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,800	1,300	980	590	400	230	160	74	28	16	8.1	4.8	2.7	1.9	1.5	1.1

1-5985. North Branch Potomac River at Luke, Md.

Location.--Lat 39°28'45", long 79°03'55", on right bank 0.2 mile downstream from Savage River, 0.5 mile northwest of Luke, Allegany County, and 53.3 miles upstream from confluence with South Branch.

Drainage area.--404 sq mi.

Records available.--June 1899 to July 1906 (published as "at Piedmont, W. Va."), October 1949 to September 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 946.25 ft above mean sea level, adjustment of 1912. June 27, 1899, to July 15, 1906, chain gage at bridge 1.1 miles downstream at datum about 35 feet lower.

Average discharge.--24 years (1899-1905, 1949-67), 683 cfs (adjusted for storage since 1949).

Extremes.--1899-1906, 1949-67: Maximum discharge, 39,400 cfs Oct. 15, 1954 (gage height, 17.15 ft); minimum daily, 6 cfs Sept. 4, 1904.

Remarks.--Flow regulated since 1913 by Stony River Reservoir, 45 miles above station (see sta. no. 1-5955) and since December 1950 by Savage River Reservoir, 5 miles above station (see sta. no. 1-5975). Some regulation at low flow by West Virginia Pulp and Paper Company at site used 1899-1906.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	10,200	13,200	15,100	17,300	(18,800)	(20,200)
Daily flow	7,340	10,500	12,700	15,400	-	-
3-day flow	5,780	7,640	8,700	9,880	-	-
7-day flow	4,090	5,390	6,200	7,180	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1951, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	97	75	62	51	-
14-day	103	79	66	55	-
30-day	110	81	68	59	-
60-day	115	85	75	67	-
90-day	125	89	77	69	-
120-day	138	98	85	77	-

Duration of daily flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
6,000	4,700	3,700	2,500	1,600	980	660	330	150	116	100	90	75	59	50	39

1-5990. Georges Creek at Franklin, Md.

Location.--Lat 39°29'38", long 79°02'42", on right bank at Franklin, Allegany County, 1 1/4 miles upstream from mouth.

Drainage area.--72.4 sq mi.

Records available.--May 1905 to July 1906 (published as "at Westernport"), October 1929 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 958.96 ft above mean sea level (West Virginia Pulp and Paper Co. bench mark). May 4, 1905, to July 15, 1906, chain gage at bridge three quarters of a mile downstream at different datum. Oct. 16, 1929, to Oct. 1, 1937, graphic water-stage recorder at site 95 ft downstream at present datum.

Average discharge.--38 years, (1929-67), 77.2 cfs.

Extremes.--1905-6, 1929-67: Maximum discharge, 8,500 cfs Mar. 17, 1936 (gage height, 9.6 ft, site then in use), from rating curve extended above 2,000 cfs on basis of slope-area measurement of peak flow; minimum, 1.6 cfs Sept. 29 to Oct. 13, 1930.
Flood of Mar. 29, 1924, reached a stage of about 10 ft, from floodmarks, at site 95 ft downstream.

Remarks.--Records include about 0.5 cfs of sewage from city of Frostburg, which obtains its water supply from Big Piney Run (Monongahela River basin) and Savage River. A negligible discharge is diverted above station by Frostburg Water Co. for municipal supplies of Eckhart and Welch Hill. An undetermined amount of water is diverted from the upper third of basin into the Wills Creek basin by the Hoffman drainage tunnel.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,030	3,330	4,460	6,260	7,920	(9,880)
Daily flow	1,100	1,840	2,440	3,340	4,130	-
3-day flow	774	1,200	1,520	1,950	2,300	-
7-day flow	531	773	933	1,130	1,280	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1930, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	4.8	3.3	2.7	1.9	-
14-day	5.3	3.5	2.8	2.0	-
30-day	6.3	4.1	3.3	2.2	-
60-day	7.9	5.1	4.0	2.7	-
90-day	9.5	5.9	4.7	3.2	-
120-day	11	7.1	5.5	3.6	-

Duration of daily flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
810	610	460	300	190	114	72	32	13	8.6	6.0	4.8	3.6	2.7	2.1	1.7

1-6000. North Branch Potomac River at Pinto, Md.

Location.--Lat 39°33'59", long 78°50'25", on right bank at downstream side of Western Maryland Railway bridge at Pinto, Allegany County, 2.8 miles downstream from Mill Run, and 32.6 miles upstream from mouth.

Drainage area.--596 sq mi.

Records available.--October 1938 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 648.23 ft above mean sea level (Corps of Engineers bench mark). Prior to Dec. 10, 1938, wire-weight gage at highway bridge 250 ft downstream at same datum.

Average discharge.--29 years, 860 cfs (unadjusted).

Extremes.--1938-67: Maximum discharge, 37,000 cfs Oct. 16, 1954 (gage height, 23.23 ft); minimum, 31 cfs Dec. 18, 19, 1943 (gage height, 1.37 ft), result of freezeup.
Flood of Mar. 29, 1924, reached a stage of about 24 ft (discharge, about 55,000 cfs). Flood of Mar. 17, 1936, reached a stage of about 23.5 ft, from floodmarks (discharge, about 50,000 cfs).

Remarks.--Some regulation at low flow by Stony River Reservoir, 66 miles above station (see sta. no. 1-5955), and since December 1950, by Savage River Reservoir (see sta. no. 1-5975).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1938, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	14,000	21,200	26,700	34,600	41,300	(48,600)
Daily flow	9,800	13,800	16,200	19,400	21,600	-
3-day flow	7,400	10,000	11,700	13,800	15,300	-
7-day flow	5,200	6,800	7,800	8,800	9,500	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1939, to Mar. 31, 1950)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	71	52	43	-	-
14-day	76	56	47	-	-
30-day	92	62	50	-	-
60-day	133	83	65	-	-
90-day	175	111	88	-	-
120-day	211	137	108	-	-

(Based on regulated period Apr. 1, 1951, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	110	85	75	65	-
14-day	110	86	77	66	-
30-day	120	94	82	72	-
60-day	130	100	96	87	-
90-day	140	110	100	90	-
120-day	162	118	104	95	-

1-6000. North Branch Potomac River at Pinto, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1938, to Sept. 30, 1950)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
8,600	6,400	4,700	2,800	1,900	1,200	870	460	220	150	93	74	55	48	43	37

(Based on regulated period Oct. 1, 1950, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
8,100	6,300	4,800	3,200	2,100	1,250	810	400	180	140	116	104	94	75	58	47

1-6010. Wills Creek below Hyndman, Pa.

Location.--Lat 39°48'43", long 78°43'00", on left bank 150 ft downstream from Pennsylvania Railroad bridge, 0.35 mile downstream from Little Wills Creek, half a mile south of Hyndman, Bedford County, and 14 miles upstream from mouth.

Drainage area.--146 sq mi.

Records available.--June 1951 to September 1967.

Gage.--Digital water-stage recorder. Datum of gage is 891.37 ft above mean sea level (Pennsylvania Railroad bench mark). Prior to Oct. 24, 1960, graphic water-stage recorder at same site and datum.

Average discharge.--16 years, 183 cfs.

Extremes.--1951-67: Maximum discharge, 11,600 cfs Oct. 15, 1954 (gage height, 11.02 ft), from rating curve extended above 6,000 cfs by logarithmic plotting; minimum, 0.70 cfs Sept. 10, 11, 1965, Aug. 9, 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	5,080	7,200	8,620	10,400	(11,800)	(13,200)
Daily flow	3,090	4,000	4,510	5,060	-	-
3-day flow	2,250	2,920	3,300	3,710	-	-
7-day flow	1,390	1,830	2,120	2,470	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1952, to Mar. 30, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.4	1.2	0.9	0.7	-
14-day	3.1	1.5	1.1	.9	-
30-day	5.3	2.7	2.0	1.6	-
60-day	7.7	4.0	3.0	2.4	-
90-day	9.5	5.4	4.2	3.5	-
120-day	13	7.8	6.3	5.3	-

Duration of daily flow

(Based on period Oct. 1, 1951, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
2,600	1,700	1,200	730	460	260	150	60	20	11	5.7	3.5	2.0	1.4	1.1	0.9

1-6015. Wills Creek near Cumberland, Md.

Location.--Lat 39°40'07", long 78°47'18", on right bank at downstream side of Western Maryland Railway bridge, 2 miles upstream from Cumberland, Allegany County, and mouth.

Drainage area.--247 sq mi.

Records available.--May 1905 to July 1906 (published as "at Cumberland"), October 1929 to September 1967.

Gage.--Digital water-stage recorder. Datum of gage is 640.89 ft above mean sea level (Corps of Engineers bench mark). May 6, 1905, to July 14, 1906, chain gage at highway bridge 700 ft upstream at different datum. Oct. 18, 1929, to Mar. 17, 1936, graphic water-stage recorder, and Apr. 1, 1936, to Mar. 19, 1937, tape gage, at site 200 ft upstream at present datum. Mar. 20, 1937, to Sept. 27, 1962, graphic water-stage recorder at present site and datum.

Average discharge.--38 years (1929-67), 309 cfs.

Extremes.--1905-6, 1929-67: Maximum discharge, 38,100 cfs Mar. 17, 1936 (gage height, 20.2 ft, from floodmarks at present site), from rating curve extended above 6,500 cfs on basis of slope-area measurement of peak flow; minimum, 9 cfs Oct. 14, 1930.

Remarks.--Records include drainage from numerous active and abandoned coal mines. An undetermined amount of water is diverted into basin from Georges Creek basin by Hoffman drainage tunnel. Slight diurnal fluctuation at low flow caused by quarry upstream.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	5,590	9,360	13,200	20,200	27,500	(37,100)
Daily flow	3,990	6,470	8,580	11,900	14,800	-
3-day flow	3,000	4,520	5,680	7,330	8,690	-
7-day flow	2,000	2,860	3,450	4,220	4,810	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1930, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	21	15	12	11	-
14-day	23	16	13	11	-
30-day	26	18	15	12	-
60-day	33	21	17	15	-
90-day	40	25	20	17	-
120-day	47	30	24	20	-

Duration of daily flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
3,400	2,600	1,800	1,100	740	450	280	130	57	40	26	21	16	14	13	11

1-6030. North Branch Potomac River near Cumberland, Md.

Location.--Lat 39°37'16", long 78°46'24", on left bank at downstream side of Wiley Ford Bridge, 2 miles south of Cumberland, Allegany County, 2.1 miles downstream from Wills Creek, and 19.6 miles upstream from confluence with South Branch.

Drainage area.--875 sq mi.

Records available.--May 1929 to September 1967. Gage-height records collected at various sites about 2 miles upstream from September 1901 to December 1932 and thereafter at present site, are contained in reports of U.S. Weather Bureau.

Gage.--Graphic water-stage recorder. Datum of gage is 585.22 ft above mean sea level (Corps of Engineers bench mark). Prior to June 18, 1929, chain gage, and Oct. 24, 1960, to Sept. 27, 1962, digital water-stage recorder, at same site and datum.

Average discharge.--38 years, 1,205 cfs (unadjusted).

Extremes.--1929-67: Maximum discharge, 88,200 cfs Mar. 17, 1936 (gage height, 29.1 ft), from rating curve extended above 21,000 cfs on basis of slope-area measurement of peak flow; minimum (river only), 12 cfs Sept. 22, 1932 (gage height, 2.38 ft); minimum daily (including flow in canal), 38 cfs Sept. 24, 1932.
Maximum stage known, 29.2 ft June 1, 1889 (discharge, about 89,000 cfs). Flood of Mar. 29, 1924, reached a stage of 28.4 ft (discharge, about 82,000 cfs).

Remarks.--Regulation by Stony River Reservoir, about 79 miles above station (see sta. no. 1-5955), and since December 1950 by Savage River Reservoir (see sta. no. 1-5975). Prior to July 1957, small amount of inflow from industrial wastes and sewage from city of Cumberland from water diverted from Evitts Creek, mouth of which is below station. Diversion to Chesapeake and Ohio Canal prior to 1935.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	18,300	27,700	36,000	52,000	66,000	(83,700)
Daily flow	14,600	22,600	28,600	37,300	44,900	-
3-day flow	10,800	16,000	19,800	25,000	29,200	-
7-day flow	7,200	10,300	12,300	14,900	16,800	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1930, to Mar. 31, 1950)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	104	60	41	28	-
14-day	112	67	47	33	-
30-day	129	77	55	40	-
60-day	175	103	75	57	-
90-day	240	133	93	67	-
120-day	283	163	114	82	-

1-6030. North Branch Potomac River near Cumberland, Md.--Continued

Magnitude and frequency of annual low flow

(Based on regulated period Apr. 1, 1951, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	130	110	103	98	-
14-day	138	112	104	99	-
30-day	154	121	110	103	-
60-day	174	133	120	112	-
90-day	192	144	130	120	-
120-day	213	160	142	132	-

Duration of daily flow

(Based on period Oct. 1, 1929, to Sept. 30, 1950)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
12,200	9,000	6,700	4,100	2,700	1,700	1,200	610	290	190	120	93	60	41	33	23

(Based on regulated period Oct. 1, 1950, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
12,000	8,600	7,000	4,500	3,000	1,800	1,130	560	260	190	150	130	120	105	97	90

1-6035. Evitts Creek near Centerville, Pa.

Location.--Lat 39°47'23", long 78°38'48", on left bank 2 miles upstream from Thomas W. Koon Dam, 3 miles south of Centerville, Bedford County, and 16.3 miles upstream from mouth.

Drainage area.--30.2 sq mi.

Records available.--September 1932 to September 1967. Prior to October 1952, published as "near Bedford Valley".

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 1,027.59 ft above mean sea level (city of Cumberland bench mark). Prior to September 26, 1962, graphic water-stage recorder at same site and datum.

Average discharge.--35 years, 29.6 cfs.

Extremes.--1932-67: Maximum discharge, 5,240 cfs Mar. 17, 1936 (gage height, 7.13 ft), from rating curve extended above 400 cfs on basis of slope-area measurement of peak flow; minimum, 0.70 cfs Dec. 17, 1958 (gage height, 0.79 ft), result of freezeup.
Maximum stage known, about 8 ft, from floodmark, date unknown.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	920	1,660	2,280	3,220	4,400	(4,960)
Daily flow	467	783	1,030	1,390	1,680	-
3-day flow	297	473	609	804	967	-
7-day flow	188	281	351	447	526	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1933, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.7	2.0	1.7	1.5	-
14-day	3.0	2.2	1.9	1.6	-
30-day	3.2	2.4	2.1	1.9	-
60-day	3.8	2.7	2.3	2.1	-
90-day	4.3	3.1	2.7	2.4	-
120-day	4.9	3.5	3.0	2.7	-

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
350	250	170	100	69	42	29	13	5.8	4.2	3.2	2.6	2.2	1.9	1.7	1.3

1-6090. Town Creek near Oldtown, Md.

Location.--Lat 39°33'12", long 78°33'19", on upstream side of highway bridge, 2.2 miles upstream from Sawpit Run, 3 miles northeast of Oldtown, Allegany County, and 4 miles upstream from mouth.

Drainage area.--148 sq mi.

Records available.--July 1928 to September 1935. Monthly discharge only for July 1928 published in WSP 1302.

Gage.--Chain gage. Altitude of gage is 550 ft (from topographic map).

Average discharge.--7 years (1928-35), 123 cfs.

Extremes.--1928-35: Maximum discharge, 9,700 cfs Oct. 23, 1929 (gage height, 14.0 ft, from graph based on gage readings); minimum, 0.9 cfs Aug. 2, 3, 7-14, 1930 (gage height, 1.41 ft).

Flood of Mar. 17 or 18, 1936, reached a stage of 19.0 ft, from floodmarks (discharge, 27,000 cfs, from rating curve extended above 1,100 cfs on basis of contracted opening measurement of peak flow).

Magnitude and frequency of annual low flow

(Based on correlation with 1-6015 Wills Creek near Cumberland, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	4.0	1.9	1.2	0.9	-

Duration of daily flow

(Based on period Oct. 1, 1928, to Sept. 30, 1935)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,700	1,300	890	500	290	160	92	41	16	11	4.8	3.0	1.9	1.4	1.1	0.9

1-6095. Sawpit Run near Oldtown, Md.

Location.--Lat 39°32'50", long 78°33'20", on left bank 900 ft upstream from bridge on State Highway 51, 1.0 mile upstream from mouth, and 3.0 miles east of Oldtown, Allegany County.

Drainage area.--5.0 sq mi, approximately.

Records available.--October 1947 to December 1958. Annual maximum for water years 1963-67.

Gage.--Water-stage recorder and concrete control. Datum of gage is 574.06 ft above mean sea level, datum of 1929.

Average discharge.--11 years, 4.11 cfs.

Extremes.--Maximum discharge, 770 cfs Oct. 15, 1954 (gage height, 4.72 ft), from rating curve extended above 110 cfs on basis of slope-area measurement of peak flow; maximum daily, 164 cfs June 8, 1955, no flow at times each year.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1958)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	247	399	524	714	(881)	(1,070)
Daily flow	95	137	162	-	-	-
3-day flow	55	63	68	-	-	-
7-day flow	32	41	47	-	-	-

*Based on water years 1948-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1958)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0	0	0	0	0
14-day	0	0	0	0	0
30-day	0	0	0	0	0
60-day	0	0	0	0	0
90-day	.1	0	0	0	0
120-day	.1	0	0	0	0

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
70	53	38	19	11	4.7	2.7	0.8	0	0	0	0	0	0	0	0

1-6100. Potomac River at Paw Paw, W. Va.

Location.--Lat 39°32'13", long 78°27'28", on left bank 250 ft upstream from bridge on Maryland State Highway 51 at Paw Paw, Morgan County, 3.3 miles downstream from Little Cacapon River, and 277 miles upstream from mouth.

Drainage area.--3,109 sq mi.

Records available.--October 1938 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 487.88 ft above mean sea level (Corps of Engineers bench mark). Prior to Mar. 25, 1939, wire-weight gage at bridge 250 ft downstream at same datum.

Average discharge.--29 years, 3,065 cfs.

Extremes.--1938-67: Maximum discharge, 111,000 cfs Oct. 16, 1942 (gage height, 38.36 ft); minimum, 164 cfs Sept. 10, 11, 1966.
Maximum stage known, 54.0 ft Mar. 18, 1936 (discharge, 240,000 cfs, from rating curve extended above 85,000 cfs on basis of slope-area measurement of peak flow at site 5 miles upstream at Okonoko, W. Va.).

Remarks.--Low flow affected by Stony River Reservoir (see sta. no. 1-5955) and since December 1950 by Savage River Reservoir (see sta. no. 1-5975).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1939, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	44,000	72,500	97,500	137,000	174,000	(217,000)
Daily flow	38,100	56,100	67,900	82,500	93,200	-
3-day flow	27,900	38,300	44,600	52,000	57,000	-
7-day flow	19,100	25,300	28,600	32,100	34,300	-

*Based on water years 1936, 1939-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1939, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	291	230	206	190	-
14-day	313	242	214	196	-
30-day	351	266	234	213	-
60-day	437	310	265	235	-
90-day	521	361	306	269	-
120-day	617	424	355	309	-

Duration of daily flow

(Based on period Oct. 1, 1938, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
33,000	23,000	17,000	10,500	7,000	4,300	2,800	1,500	720	510	370	290	250	230	220	190

1-6125. Little Tonoloway Creek near Hancock, Md.

Location.--Lat 39°42'45", long 78°13'55", on right bank at downstream side of highway bridge, 100 ft downstream from unnamed tributary and 2.8 miles northwest of Hancock, Washington County.

Drainage area.--16.9 sq mi.

Records available.--August 1947 to September 1963. Prior to October 1951, published as Tonoloway Creek near Hancock.

Gage.--Water-stage recorder and concrete control. Datum of gage is 457.51 ft above mean sea level, datum of 1929.

Average discharge.--16 years, 15.3 cfs.

Extremes.--1947-63: Maximum discharge, 1,470 cfs Oct. 15, 1954 (gage height, 7.10 ft), from rating curve extended above 440 cfs on basis of slope-area measurement of peak flow; no flow at times in most years.

Remarks.--Occasional small diversions for irrigation of peach orchards above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1963)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	526	902	1,210	1,670	(2,070)	(2,510)
Daily flow	294	435	522	625	-	-
3-day flow	201	281	327	376	-	-
7-day flow	122	166	191	219	-	-

*Based on water years 1948-64

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1963)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.1	0	0	0	0
14-day	.1	0	0	0	0
30-day	.2	0	0	0	0
60-day	.4	.1	0	0	0
90-day	.7	.2	.1	.1	-
120-day	.9	.4	.2	.1	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1963)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
240	170	120	67	37	20	12	4.1	1.1	0.5	0.2	0	0	0	0	0

1-6130. Potomac River at Hancock, Md.

Location.--Lat 39°41'49", long 78°10'39", on left bank 0.2 mile downstream from Little Tonoloway Creek, half a mile downstream from bridge on U.S. Highway 522 at Hancock, Washington County, and 239 miles upstream from mouth.

Drainage area.--4,073 sq mi.

Records available.--October 1932 to September 1967. Gage-height records collected at same site since June 1925 are contained in reports of U.S. Weather Bureau.

Gage.--Digital water-stage recorder. Datum of gage is 383.46 ft above mean sea level, adjustment of 1912. Oct. 1, 1932, to Aug. 27, 1934, chain gage, and Aug. 28, 1934, to Jan. 5, 1935, Mar. 18, 1936, to Jan. 20, 1937, wire-weight gage, on former highway bridge just upstream at same datum. Jan. 6, 1935, to Mar. 18, 1936, Jan. 21, 1937, to Nov. 3, 1965, graphic water-stage recorder at present site and datum.

Average discharge.--35 years, 3,928 cfs.

Extremes.--1932-67: Maximum discharge, 340,000 cfs Mar. 18, 1936 (gage height, 47.6 ft), from rating curve extended above 120,000 cfs on basis of slope-area measurement of peak flow; minimum observed, 180 cfs Oct. 4, 1932 (gage height, 2.01 ft).
Maximum stage known prior to 1932, about 40 ft in May 1889 (discharge, about 220,000 cfs).

Remarks.--Slight regulation at low flow from power plants upstream. Low flow affected slightly by Stony River Reservoir (see sta. no. 1-5955) and since December 1950 by Savage River Reservoir (see sta. no. 1-5975).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	60,700	106,000	146,000	211,000	272,000	(346,000)
Daily flow	49,300	82,100	111,000	156,000	198,000	-
3-day flow	35,800	56,400	73,100	98,100	120,000	-
7-day flow	24,600	36,100	44,300	55,300	63,900	-

*Based on water years 1889, 1924, 1929, 1933-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1933, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	354	283	256	237	-
14-day	384	301	268	245	-
30-day	426	328	291	266	-
60-day	546	393	337	299	-
90-day	662	460	388	340	-
120-day	800	549	458	397	-

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
40,000	30,000	22,000	13,500	9,000	5,500	3,700	1,900	920	640	460	370	320	290	270	230

1-6135. Licking Creek near Sylvan, Pa.

Location.--Lat 39°43'20", long 78°03'35", at highway bridge 200 ft upstream from Pennsylvania-Maryland State line, 3 miles southwest of Sylvan, Franklin County, and 10 miles upstream from mouth.

Drainage area.--158 sq mi.

Records available.--June 1930 to January 1942.

Gage.--Chain gage. Datum of gage is 434.16 ft above mean sea level, adjustment of 1907.

Average discharge.--11 years (1930-41), 166 cfs.

Extremes.--Maximum discharge, 20,700 cfs Mar. 18, 1936 (gage height, 17.4 ft, from floodmark), from rating curve extended above 5,500 cfs on basis of contracted-opening measurement of peak flow; minimum observed, 3.0 cfs Aug. 8, 1930 (gage height, 0.64.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1930, to Sept. 30, 1941)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	3,810	6,150	8,500	(12,700)	(17,100)	(22,800)
Daily flow	2,800	5,030	7,230	-	-	-
3-day flow	1,850	3,310	4,750	-	-	-
7-day flow	1,160	1,920	2,620	-	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1931, to Mar. 31, 1941)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	11	7.7	6.3	-	-
14-day	13	8.5	6.8	-	-
30-day	16	10	8.0	-	-
60-day	22	14	10	-	-
90-day	28	17	12	-	-
120-day	33	21	16	-	-

Duration of daily flow

(Based on period Oct. 1, 1930, to Sept. 30, 1941)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
2,100	1,600	1,100	610	330	200	130	68	32	23	14	9.7	6.1	5.6	5.2	4.4

1-6145. Conococheague Creek at Fairview, Md.

Location.--Lat 39°42'57", long 77°49'.8", on right bank 0.7 mile upstream from highway bridge in Fairview, Washington County, 2 miles upstream from Rockdale Run, and 18.7 miles upstream from mouth.

Drainage area.--494 sq mi.

Records available.--June 1928 to September 1967.

Gage.--Digital water-stage recorder. Datum of gage is 391.77 ft above mean sea level, adjustment of 1912. Prior to Dec. 6, 1932, chain gage at highway bridge 0.7 mile downstream at datum 2.85 ft lower. Dec. 6, 1932, to Oct. 7, 1933, staff gage 150 ft downstream from former site at datum 4.84 ft lower than present datum. Oct. 8, 1933, to Dec. 20, 1963, graphic water-stage recorder at present site and datum.

Average discharge.--39 years, 546 cfs.

Extremes.--1928-67: Maximum discharge, 17,100 cfs Nov. 22, 1952 (gage height, 15.16 ft, from high-water mark in well); minimum, 21 cfs Aug. 8, Sept. 12, 1966; minimum daily, 25 cfs Nov. 28, 1930.
Maximum stage known, about 16.5 ft (present datum) sometime in 1889, from information by local residents (discharge, about 22,000 cfs).

Remarks.--Low flow partly regulated by small powerplants near Mercersburg, Pa.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1928, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	7,530	11,100	13,800	17,800	21,200	(24,900)
Daily flow	6,060	8,480	10,200	12,500	14,300	-
3-day flow	4,380	6,200	7,460	9,110	10,400	-
7-day flow	3,000	4,130	4,840	5,710	6,340	-

*Based on water years 1889, 1924, 1929-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1929, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	82	59	48	40	-
14-day	86	62	51	43	-
30-day	96	70	58	50	-
60-day	110	76	63	55	-
90-day	130	86	70	59	-
120-day	150	100	81	68	-

Duration of daily flow

(Based on period Oct. 1, 1928, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
5,000	3,800	2,900	1,800	1,200	770	540	310	170	130	92	74	58	48	42	33

1-6180. Potomac River at Shepherdstown, W. Va.

Location.--Lat 39°26'04", long 77°48'07", on right bank 0.1 mile downstream from Rumsey Bridge at Shepherdstown, Jefferson County, W. Va., 3.3 miles upstream from Antietam Creek, and 184 miles upstream from mouth.

Drainage area.--5,936 sq mi.

Records available.--August 1928 to September 1953, July 1964 to September 1967.

Gage.--Digital water-stage recorder. Datum of gage is 281.00 ft above mean sea level, adjustment of 1912. Prior to Nov. 4, 1965, graphic water-stage recorder at same site and datum.

Average discharge.--28 years (1928-53, 1964-67), 5,678 cfs.

Extremes.--1928-53, 1964-67: Maximum discharge, 335,000 cfs Mar. 19, 1936 (gage height, 42.1 ft, from floodmarks), from rating curve extended above 200,000 cfs on basis of slope-area measurements of peak flow; minimum, 170 cfs Aug. 1, 1966; minimum daily, 185 cfs July 31, 1966.

Floods in June 1889 and May 1924 reached stages of 39.2 and 29.8 ft, respectively, from floodmarks (discharges, about 290,000 and 168,000 cfs, respectively).

Remarks.--Some regulation at low flow by powerplants above station, Stony River Reservoir (see sta. no. 1-5955), and since December 1950 by Savage River Reservoir (see sta. no. 1-5975).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1928, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	75,600	124,000	166,000	231,000	289,000	(358,000)
Daily flow	63,000	89,000	126,000	182,000	244,000	-
3-day flow	48,500	72,000	91,000	130,000	168,000	-
7-day flow	33,000	47,000	66,500	76,000	95,000	-

*Based on water years 1889, 1924, 1928-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1929, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	570	440	370	310	-
14-day	640	470	390	330	-
30-day	710	520	450	390	-
60-day	900	620	520	440	-
90-day	1,020	720	600	500	-
120-day	1,220	880	730	610	-

Duration of daily flow

(Based on period Oct. 1, 1928, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
54,000	41,000	30,000	19,000	12,000	7,900	5,300	2,900	1,600	1,100	780	600	470	390	360	290

1-6190. Antietam Creek near Waynesboro, Pa.

Location.--Lat 39°42'59", long 77°36'28", on right bank 100 feet upstream from highway bridge, 0.7 mile downstream from confluence of West and East Branches, 2 1/2 miles southwest of Waynesboro, Franklin County, Pa., and 36.6 miles upstream from mouth.

Drainage area.--93.5 sq mi.

Records available.--May 1948 to September 1951, October 1965 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 550.64 ft above mean sea level (Corps of Engineers bench mark). May 1948 to September 1951 wire-weight gage 100 ft downstream at present datum.

Average discharge.--5 years (1948-51, 1965-67), 106 cfs.

Extremes.--1948-51, 1965-67: Maximum discharge, 1,490 cfs Nov. 25, 1950 (gage height, 8.55 ft) from rating curve extended above 400 cfs by logarithmic plotting; minimum daily, 11 cfs Jan. 30, 1966.

Remarks.--Occasional regulation from mills above station.

Magnitude and frequency of annual low flow

(Based on correlation with 1-6195 Antietam Creek near Sharpsburg, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	27	21	18	16	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1951, and Oct. 1, 1965, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
580	410	340	250	210	160	125	82	56	44	29	21	18	17	16	14

1-6195. Antietam Creek near Sharpsburg, Md.

Location.--Lat 39°27'01", long 77°43'52", on left bank 400 ft downstream from Burnside Bridge, 1 mile southeast of Sharpsburg, Washington County, and 4 miles upstream from mouth.

Drainage area.--281 sq mi.

Records available.--June 1897 to September 1905. August 1928 to September 1967. Monthly discharge only for some periods, published in WSP 1302.

Gage.--Digital water-stage recorder. Concrete control since Mar. 29, 1934. Datum of gage is 311.00 ft above mean sea level, adjustment of 1912. June 24, 1897, to Aug. 25, 1905, staff gage a few hundred feet downstream from Middle Bridge, 1.2 miles upstream at datum about 12 feet higher. Aug. 21, 1928, to July 13, 1933, staff gage at Burnside Bridge at present datum. July 14, 1933, to Oct. 1, 1962, graphic water-stage recorder at present site and datum.

Average discharge.--44 years (1897-1903, 1904-5, 1930-1967), 257 cfs (adjusted for inflow since 1930).

Extremes.--1928-67: Maximum discharge, 12,600 cfs July 20, 1956 (gage height, 16.73 ft), from rating curve extended above 4,300 cfs on basis of contracted-opening measurement of peak flow; minimum, 9.4 cfs Nov. 22, 1957, result of regulation caused by construction work above station; minimum daily, 37 cfs Jan. 30, 1966.

Remarks.--Some diurnal fluctuation caused by powerplant above station. Since 1928, records include pumpage from Potomac River for municipal supply of Hagerstown. This water enters Antietam Creek above station as sewage.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1928, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,420	4,200	5,700	7,990	10,000	(12,300)
Daily flow	1,630	2,520	3,200	4,140	4,910	-
3-day flow	1,210	1,800	2,190	2,690	3,060	-
7-day flow	858	1,250	1,510	1,820	2,040	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1929, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	85	68	61	56	-
14-day	88	70	63	58	-
30-day	94	75	67	61	-
60-day	104	82	73	66	-
90-day	109	85	76	70	-
120-day	118	91	80	73	-

Duration of daily flow

(Based on period Oct. 1, 1928, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,350	1,050	850	630	490	360	280	180	130	108	90	79	68	63	58	52

1-6365. Shenandoah River at Millville, W. Va.

Location.--Lat 39°16'55", long 77°47'22", on left bank 0.4 mile downstream from Cattail Run, 1 mile upstream from Millville, Jefferson County, W. Va., and 5 miles upstream from mouth.

Drainage area.--3,040 sq mi.

Records available.--April 1895 to March 1909, August 1928 to September 1967.

Gage.--Digital water-stage recorder. Datum of gage is 293.00 ft above mean sea level, adjustment of 1912. Apr. 15, 1895, to Mar. 13, 1909, staff gage at site three-quarters of a mile downstream at datum 0.32 ft higher. Aug. 23, 1928, to Nov. 4, 1963, graphic water-stage recorder at present site and datum.

Average discharge.--52 years (1895-1908, 1928-67), 2,614 cfs.

Extremes.--1895-1909, 1928-67: Maximum discharge, 230,000 cfs Oct. 16, 1942 (gage height, 32.4 ft, from floodmarks); minimum, about 59 cfs Oct. 4, 1930 (gage height, 0.39 ft); minimum daily, 194 cfs July 24, 1930.
Flood in 1870 reached practically same stage as flood of Mar. 18, 1936, 26.36 ft (discharge, 151,000 cfs).

Remarks.--Regulation by hydroelectric plants, particularly that of Potomac Light and Power Co., half a mile upstream from station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1895, to Sept. 30, 1908, and Oct. 1, 1928, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	31,400	59,400	85,200	128,000	168,000	217,000
Daily flow	27,800	50,200	69,700	100,000	128,000	160,000
3-day flow	20,500	36,200	49,500	70,000	88,100	109,000
7-day flow	13,800	22,700	29,800	40,400	49,300	59,300

*Based on water years 1896-1908, 1924, 1929-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1895, to Mar. 30, 1908, and Apr. 1, 1929, to Mar. 30, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	554	417	358	316	280
14-day	579	437	376	334	290
30-day	623	472	411	368	320
60-day	705	510	437	387	340
90-day	797	546	457	399	350
120-day	889	610	512	448	395

Duration of daily flow

(Based on period Oct. 1, 1895, to Sept. 30, 1908, and Oct. 1, 1928, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
26,000	17,000	12,500	7,700	5,200	3,400	2,500	1,500	980	780	600	500	410	370	340	260

1-6370. Little Catoctin Creek at Harmony, Md.

Location.--Lat 39°28'55", long 77°32'20", on right bank at upstream side of highway bridge, 0.9 mile southwest of Harmony, Frederick County, and 2.8 miles upstream from mouth.

Drainage area.--8.9 sq mi, approximately.

Records available.--July 1947 to October 1958. Annual maximum for water years 1959-67.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 540 ft (from topographic map).

Average discharge.--11 years, 10.1 cfs.

Extremes.--Maximum discharge, 5,400 cfs Aug. 20, 1952 (gage height, 8.49 ft in gage well, 9.82 ft from floodmark), from rating curve extended above 220 cfs on basis of slope-area measurements and contracted-opening measurement of peak flow; minimum, 0.4 cfs July 28 to Aug. 2, Oct. 12-14, 1954, Aug. 17, 18, 1957.

Remarks.--Small diversion above station for municipal water supply of Middletown.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1958)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	453	1,060	1,700	2,870	(4,080)	(5,660)
Daily flow	133	207	253	-	-	-
3-day flow	82	120	141	-	-	-
7-day flow	56	81	93	-	-	-

*Based on water years 1948-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1958)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.1	0.7	0.6	-	-
14-day	1.2	.8	.6	-	-
30-day	1.4	1.0	.8	-	-
60-day	1.8	1.2	1.0	-	-
90-day	2.2	1.4	1.1	-	-
120-day	2.7	1.6	1.2	-	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1958)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
95	64	44	31	23	16	12	5.4	2.6	2.0	1.3	1.0	0.8	0.7	0.6	0.5

1-6375. Catoctin Creek near Middletown, Md.

Location.--Lat 39°25'35", long 77°33'25", on right bank 300 ft downstream from bridge on State Highway 17, 1.3 miles south of Middletown, Frederick County, 2 1/4 miles downstream from Little Catoctin Creek, and 14.8 miles upstream from mouth.

Drainage area.--66.9 sq mi.

Records available.--August 1947 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 385 ft (from topographic map). Prior to Oct. 20, 1960, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 67.7 cfs.

Extremes.--1947-67: Maximum discharge, 7,760 cfs July 18, 1949 (gage height, 11.18 ft), from rating curve extended above 1,500 cfs on basis of slope-area measurement of peak flow; minimum, zero flow Aug. 27 to Sept. 12, 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,920	3,260	4,510	6,630	(8,690)	(11,300)
Daily flow	901	1,310	1,550	1,810	-	-
3-day flow	648	879	974	1,050	-	-
7-day flow	434	580	639	687	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.0	1.0	0.4	0.2	-
14-day	3.7	1.3	.6	.3	-
30-day	4.7	2.1	1.3	.9	-
60-day	6.7	3.1	2.1	1.5	-
90-day	7.6	4.3	3.2	2.5	-
120-day	11	6.1	4.4	3.4	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
680	510	380	230	160	100	70	31	15	8.6	4.3	3.1	1.8	1.0	0.7	0

1-6385. Potomac River at Point of Rocks, Md.

Location.--Lat 39°16'25", long 77°32'35", on left bank at downstream side of bridge on U.S. Highway 15 at Point of Rocks, Frederick County, a third of a mile downstream from Catoctin Creek, Virginia, and 160 miles upstream from mouth.

Drainage area.--9,651 mi.

Records available.--February 1895 to September 1967.

Gage.--Digital water-stage recorder. Datum of gage is 200.54 ft above mean sea level, adjustment of 1912. Prior to Sept. 2, 1902, wire-weight gage on downstream side of bridge at datum about 0.45 ft higher. Sept. 2, 1902, to Oct. 28, 1929, chain gage at same site and present datum. Oct. 29, 1929, to Nov. 1, 1964, graphic water-stage recorder at same site and present datum.

Average discharge.--72 years, 9,107 cfs.

Extremes.--1895-1967: Maximum discharge, 480,000 cfs Mar. 19, 1936 (gage height, 41.03 ft), from rating curve extended above 300,000 cfs on basis of adjustment of figure of peak flow at station near Washington for inflow and storage, and slope-area measurement of peak flow; minimum, 530 cfs Sept. 11, 12, 1966 (gage height, 0.27 ft).

Flood of June 2, 1889, reached a stage of 40.2 ft from floodmarks (discharge about 460,000 cfs).

Remarks.--Low flow affected slightly since 1913 by Stony River Reservoir (see sta. no. 1-5955), and since December 1950 by Savage River Reservoir (see sta. no. 1-5975). Low flow affected extensively at times by run-of-the-river hydroelectric plants.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1895, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	102,000	165,000	218,000	299,000	370,000	453,000
Daily flow	91,700	144,000	185,000	245,000	295,000	350,000
3-day flow	72,100	111,000	142,000	184,000	220,000	258,000
7-day flow	49,700	74,300	92,400	117,000	138,000	159,000

*Based on water years 1889, 1895-1967

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1895, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1,300	976	839	741	650
14-day	1,400	1,040	892	785	680
30-day	1,550	1,150	994	881	780
60-day	1,880	1,340	1,130	981	840
90-day	2,240	1,520	1,260	1,080	900
120-day	2,590	1,750	1,440	1,230	1,020

Duration of daily flow

(Based on period Oct. 1, 1895, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
85,000	64,000	45,000	29,000	20,000	12,500	8,800	5,200	3,000	2,200	1,600	1,260	1,000	870	780	660

1-6390. Monocacy River at Bridgeport, Md.

Location.--Lat 39°40'43", long 77°14'06", on right bank 60 ft downstream from bridge on State Highway 97, at Bridgeport, Carroll County, 0.9 mile upstream from Cattail Branch, and 47.9 miles upstream from mouth.

Drainage area.--173 sq mi.

Records available.--May 1942 to September 1967.

Gage.--Digital water-stage recorder. Concrete control since Sept. 15, 1947. Datum of gage is 340.83 ft above mean sea level (Corps of Engineers bench mark). Prior to May 3, 1946, staff gage and crest-stage gages at site 0.3 mile downstream at datum 0.98 ft lower. May 3, 1946, to Sept. 30, 1961, graphic water-stage recorder at present site and datum.

Average discharge.--25 years, 187 cfs.

Extremes.--1942-67: Maximum discharge, 15,000 cfs May 21, 1943 (gage height, 20.53 ft, former site and datum), from rating curve extended above 6,700 cfs on basis of logarithmic plotting and velocity-area studies; minimum, no flow July 24-29, 1966.
Maximum stage known, about 25 ft, present site and datum, Aug. 24, 1933, from floodmarks; stage exceeded that of June 1889, from information by local residents.

Remarks.--Occasional regulation at low flow from unknown source above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1942, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	7,920	10,300	11,700	13,500	14,800	(16,100)
Daily flow	4,830	6,140	6,790	7,430	7,810	-
3-day flow	2,540	3,250	3,590	3,920	4,110	-
7-day flow	1,450	1,920	2,180	2,440	2,610	-

*Based on water years 1942-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1943, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.3	1.0	0.5	0.1	-
14-day	4.2	1.5	.7	.4	-
30-day	6.0	2.9	2.0	1.4	-
60-day	9.6	4.8	3.4	2.6	-
90-day	15	6.8	4.6	3.4	-
120-day	21	10	7.0	5.2	-

Duration of daily flow

(Based on period Oct. 1, 1942, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
3,300	2,400	1,600	760	400	200	125	54	22	13	6.2	3.9	2.1	1.1	0.4	0.1

1-6395. Big Pipe Creek at Bruceville, Md.

Location.--Lat 39°36'45", long 77°14'10", on left bank 300 ft downstream from bridge on State Highway 194, 800 ft downstream from Bruceville, Carroll County, 3 miles upstream from confluence with Little Pipe Creek.

Drainage area.--102 sq mi.

Records available.--October 1947 to September 1967. Prior to December 1947 monthly discharge only, published in WSP 1302.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 340 ft (from topographic map). Prior to Dec. 14, 1960, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 98.1 cfs.

Extremes.--1947-67: Maximum discharge, 9,500 cfs July 12, 1949 (gage height, 11.92 ft), from rating curve extended above 2,300 cfs on basis of slope-area measurement of peak flow and slope-conveyance study; minimum daily 1.0 cfs Sept. 12, 1966.

Remarks.--Occasional diversion.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	3,100	4,570	5,590	6,930	(7,940)	(8,980)
Daily flow	1,600	2,070	2,250	2,390	-	-
3-day flow	889	1,210	1,360	1,520	-	-
7-day flow	566	762	867	976	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	19	10	6.8	4.4	-
14-day	20	11	8.1	5.4	-
30-day	22	13	9.3	6.3	-
60-day	28	16	12	8.5	-
90-day	32	20	15	11	-
120-day	35	23	18	15	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,150	770	480	280	200	130	93	56	37	29	21	16	12	8.8	5.0	1.7

1-6400. Little Pipe Creek at Avondale, Md.

Location.--Lat 39°33'40", long 77°02'38", on left bank at bridge, 0.1 mile downstream from Copps Branch, and 1/2 mile northwest of Avondale, Carroll County.

Drainage area.--8.10 sq mi.

Records available.--August 1947 to September 1956. Annual maximum for water years 1959-64, 1967.

Gage.--Water-stage recorder and concrete control August 1947 to September 1956. Crest-stage gage during water years 1959-67. Altitude of gage is 525 ft (from topographic map).

Average discharge.--9 years, 9.21 cfs (adjusted for inflow).

Extremes.--Maximum discharge, 1,880 cfs July 4, 1956 (gage height, 8.47 ft), from rating curve extended above 130 cfs on basis of slope-area determinations at gage heights 3.85 and 5.50 ft, and contracted-opening determination at 7.60 ft; minimum, 1.4 cfs July 1, 1954, result of storage behind temporary earth dam upstream; minimum daily, 3.0 cfs Sept. 13, 1947.

Remarks.--Records include pumpage from Patapsco River basin for municipal supply of Westminster which is discharged as sewage into Little Pipe Creek above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	469	896	1,290	1,920	(2,520)	(3,240)

Magnitude and frequency of annual low flow

(Based on correlation with 1-5860 North Branch Patapsco River at Cedarhurst, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.8	2.0	1.7	-	-

Note: Low-flow data adjusted to represent natural flow.

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1956)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
75	53	35	22	17	13	R_{10}	$R_{7.6}$	$R_{5.8}$	$R_{5.2}$	$R_{4.7}$	$R_{4.3}$	$R_{4.0}$	$R_{3.8}$	$R_{3.6}$	$R_{3.4}$

R - Affected by sewage diverted into basin

1-6405. Owens Creek at Lantz, Md.

Location.--Lat 39°40'36", long 77°27'50", on right bank half a mile west of Lantz Post Office (Deerfield station on Western Maryland Railway), Frederick County, and 14.2 miles upstream from mouth.

Drainage area.--5.93 sq mi.

Records available.--October 1931 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 965 ft (from topographic map). Prior to Nov. 6, 1963, graphic water-stage recorder at same site and datum.

Average discharge.--36 years, 8.60 cfs (adjusted for diversion).

Extremes.--1931-67: Maximum discharge, 3,270 cfs Dec. 1, 1934 (gage height, 8.4 ft); from rating curve extended above 750 cfs on basis of slope-area measurements at gage heights 5.11 and 6.30 ft; no flow Sept. 2-11, 1966.

Remarks.--A small diversion is occasionally made to Victor Cullen State School at Cullen, half a mile above station. No diversion has been made for several years.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1931, to Sept. 30, 1967

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	355	743	1,130	1,800	2,470	(3,310)
Daily flow	110	195	271	394	509	-
3-day flow	66	108	142	194	240	-
7-day flow	46	70	87	111	130	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1932, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.5	0.2	0.1	0.1	-
14-day	.6	.2	.1	.1	-
30-day	.8	.3	.2	.1	-
60-day	1.0	.5	.4	.3	-
90-day	1.5	.8	.5	.4	-
120-day	1.8	.9	.7	.5	-

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
77	53	41	27	20	14	9.4	4.8	2.2	1.3	0.7	0.4	0.3	0.2	0.2	0

1-6410. Hunting Creek at Jimtown, Md.

Location.--Lat 39°35'40", long 77°23'50", on right bank just downstream from highway bridge, 0.4 mile southwest of Jimtown, Frederick County, 2 1/4 miles upstream from Little Hunting Creek, and 5.2 miles upstream from mouth.

Drainage area.--18.4 sq mi.

Records available.--October 1949 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 355 ft (from topographic map). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--18 years, 22.7 cfs.

Extremes.--1949-67: Maximum discharge, 1,170 cfs Sept. 1, 1952 (gage height, 4.94 ft), from rating curve extended above 500 cfs by logarithmic plotting; minimum, 0.4 cfs Sept. 9, 1966 (gage height, 1.48 ft).

Remarks.--Slight regulation at irregular intervals caused by pumpage at recreation camp near Foxville, and from occasional draining and filling of pond near Thurmont by Maryland Game and Inland Fish Commission.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	688	1,020	1,220	1,460	(1,630)	(1,780)
Daily flow	281	424	530	677	-	-
3-day flow	187	264	310	365	-	-
7-day flow	129	174	198	221	-	-

*Based on water years 1950-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1950, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.9	1.3	1.0	0.8	-
14-day	2.0	1.4	1.2	1.0	-
30-day	2.4	1.7	1.4	1.2	-
60-day	2.8	2.0	1.6	1.4	-
90-day	3.0	2.2	1.9	1.7	-
120-day	3.6	2.8	2.5	2.3	-

Duration of daily flow

(Based on period Oct. 1, 1949, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
220	170	125	75	54	35	25	11	5.1	3.6	2.4	1.9	1.5	1.3	1.1	0.8

1-6415. Fishing Creek near Lewistown, Md.

Location.--Lat 39°31'35", long 77°28'00", on left bank immediately upstream from Fishing Creek Reservoir, 50 ft downstream from Little Fishing Creek, 2.8 miles west of Lewistown, Frederick County, and 9.9 miles upstream from mouth.

Drainage area.--7.29 sq mi.

Records available.--October 1947 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 735 ft (from topographic map). Prior to Nov. 6, 1963, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 10.3 cfs.

Extremes.--1947-67: Maximum discharge, 500 cfs July 12, 1949 (gage height, 3.73 ft); from rating curve extended above 100 cfs on basis of slope-area measurement of peak flow; minimum, 0.6 cfs Sept. 10, 11, 12, 1966.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	114	220	317	476	(624)	(802)
Daily flow	62	103	138	193	-	-
3-day flow	51	80	103	136	-	-
7-day flow	43	63	78	98	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1.3	0.9	0.8	0.7	-
14-day	1.4	1.0	.8	.7	-
30-day	1.5	1.1	1.0	.8	-
60-day	1.7	1.3	1.1	1.0	-
90-day	1.8	1.4	1.2	1.0	-
120-day	2.3	1.5	1.3	1.1	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
64	51	41	30	24	18	13	6.1	2.9	2.1	1.5	1.2	1.0	0.9	0.9	0.7

1-6420. Monocacy River near Frederick, Md.

Location.--Lat 39°27'09", long 77°22'16", on downstream side of bridge on State Highway 26, 1,200 ft upstream from Israel Creek, and 3.3 miles northeast of Frederick, Frederick County.

Drainage area.--665 sq mi.

Records available.--August 1896 to September 1930.

Gage.--Chain gage. Datum of gage is 242.45 ft above mean sea level (levels by Corps of Engineers). Prior to Sept. 3, 1902, wire-weight gage at same site and datum.

Average discharge.--34 years (1896-1930), 943 cfs.

Extremes.--Maximum discharge, 26,600 cfs Sept. 1, 1911 (gage height, 27.5 ft, from graph based on gage readings), from rating curve extended above 4,700 cfs on basis of curve of relation with station at Jug Bridge; minimum, 15 cfs several days in October 1910 (gage height, 3.54 ft). Maximum stage known, about 35 ft in June 1889, from floodmark (discharge, about 46,000 cfs, from rating curve extended as explained above.)

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1896, to Sept. 30, 1930)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	17,000	22,800	26,800	32,100	36,300	(40,600)
Daily flow	13,300	16,300	18,000	20,000	21,400	-
3-day flow	8,970	11,400	12,900	14,700	16,000	-
7-day flow	5,200	6,800	7,800	8,800	9,300	-

*Based on water years 1889, 1897-1930

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1897, to Mar. 30, 1930)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	86	50	36	27	-
14-day	96	57	42	33	-
30-day	124	79	61	49	-
60-day	173	108	84	68	-
90-day	224	137	103	81	-
120-day	271	161	120	93	-

Duration of daily flow

(Based on period Oct. 1, 1896, to Sept. 30, 1930)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
12,300	9,500	6,900	3,600	2,000	1,100	730	420	230	170	110	78	55	41	35	22

1-6425. Linganore Creek near Frederick, Md.

Location.--Lat 39°24'55", long 77°20'00", on left bank 2 1/2 miles upstream from mouth and 4 miles east of Frederick, Frederick County.

Drainage area.--82.3 sq mi.

Records available.--November 1931 to March 1932, September 1934 to September 1967.

Gage.--Digital water-stage recorder. Concrete control since Sept. 23, 1946. Altitude of gage is 270 ft (from topographic map). Prior to Mar. 27, 1932, staff gage at Frederick pumping station 1 1/2 miles downstream at datum about 20 ft lower. Sept. 12, 1934, to Sept. 25, 1946, staff gage at present site and datum. Sept. 26, 1946, to Sept. 30, 1961, graphic water-stage recorder at present site and datum.

Average discharge.--33 years (1934-67), 79.2 cfs.

Extremes.--1931-32, 1934-67: Maximum discharge 4,130 cfs Aug. 13, 1955 (gage height, 11.39 ft), from rating curve extended above 1,500 cfs on basis of slope-area measurement at gage height 10.01 ft; maximum gage height, 12.22 ft June 2, 1946; minimum, 2.0 cfs Sept. 8, 1966 (gage height, 1.14 ft).

Flood of Aug. 23 or 24, 1933, reached a stage of 10.5 ft, from floodmarks (discharge 2,920 cfs).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1934, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	2,450	3,240	3,690	4,190	4,520	(4,810)
Daily flow	1,200	1,750	2,110	2,550	2,870	-
3-day flow	650	925	1,100	1,330	1,490	-
7-day flow	415	578	675	785	860	-

*Based on water years 1933-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1935, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	15	9.2	6.6	4.9	-
14-day	17	9.9	7.2	5.4	-
30-day	19	12	8.8	6.9	-
60-day	22	14	11	8.8	-
90-day	25	16	13	11	-
120-day	28	19	16	13	-

Duration of daily flow

(Based on period Oct. 1, 1934, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
790	540	370	220	160	110	79	49	31	24	17	13	10	8.5	7.1	3.1

1-6430. Monocacy River at Jug Bridge near Frederick, Md.

Location.--Lat 39°24'13", long 77°21'58", on right bank a quarter of a mile upstream from Jug Bridge on U.S. Highway 40, 0.35 mile downstream from Linganore Creek, 2 miles east of Frederick, Frederick County, and 15.8 miles upstream from mouth.

Drainage area.--817 sq mi.

Records available.--October 1929 to September 1967. Monthly discharge only for October, November 1929, published in WSP 1302.

Gage.--Water-stage recorder. Datum of gage is 231.92 ft above mean sea level (Corps of Engineers bench mark).

Average discharge.--38 years, 862 cfs.

Extremes.--1929-67: Maximum discharge, 51,000 cfs Aug. 24, 1933 (gage height, 28.1 ft); minimum daily, 19 cfs Sept. 7-13, 1966. Maximum stage known, 30 ft in June 1889, from floodmarks (discharge, 56,000 cfs).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	18,200	27,000	33,200	41,700	48,300	(55,200)
Daily flow	13,800	20,200	24,600	30,200	34,400	-
3-day flow	8,620	12,100	14,300	16,800	18,500	-
7-day flow	5,400	7,190	8,140	9,130	9,740	-

*Based on water years 1889, 1930-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1930, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	95	58	43	33	-
14-day	102	61	46	36	-
30-day	120	73	55	43	-
60-day	154	89	67	52	-
90-day	183	104	79	63	-
120-day	224	129	98	78	-

Duration of daily flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
10,000	7,400	5,100	2,900	1,800	1,100	760	430	230	170	110	79	60	52	44	28

1-6435. Bennett Creek at Park Mills, Md.

Location.--Lat 39°17'40", long 77°24'30", on left bank 75 ft downstream from highway bridge, 0.2 mile south of Park Mills, Frederick County, and 1.8 miles upstream from mouth.

Drainage area.--62.8 sq mi.

Records available.--July 1948 to September 1958, water years 1960-66 (annual maximums only), August 1966 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 240 ft (from topographic map). Prior to Oct. 1, 1958, graphic water-stage recorder at same site and datum. Oct. 1, 1959, to July 31, 1966, crest-stage gage at same site and datum.

Average discharge.--11 years (1948-58, 1967) 65.2 cfs.

Extremes.--1948-58, 1960-67: Maximum discharge, 3,230 cfs Nov. 21, 1952 (gage height, 10.34 ft in gage well, 10.77 ft from outside gage), from rating curve extended above 1,500 cfs on basis of slope-area measurement at gage height, 8.12 ft; minimum, 0.30 cfs Sept. 8, 1966 (gage height, 0.80 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1958, and Oct. 1, 1966, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	1,930	2,550	2,930	3,370	(3,670)	(3,960)
Daily flow	930	1,400	1,700	-	-	-
3-day flow	520	810	1,000	-	-	-
7-day flow	350	500	600	-	-	-

*Based on water years 1949-67

Magnitude and frequency of annual low flow

(Based on correlation with 1-6450 Seneca Creek near Dawsonville, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	9.4	4.3	2.7	1.8	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1958, and Oct. 1, 1966, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
670	500	320	190	130	84	64	41	26	20	15	12	8.4	7.4	6.7	5.8

1-6445. Great Seneca Creek near Gaithersburg, Md.

Location.--Lat 39°10'01", long 77°13'37", at highway bridge 0.1 mile downstream from Whetstone Run and 2 miles northwest of Gaithersburg, Montgomery County.

Drainage area.--41.0 sq mi.

Records available.--March 1925 to January 1931.

Gage.--Chain gage. Datum of gage is 305.37 ft above mean sea level (Washington Suburban Sanitary Commission benchmark).

Average discharge.--5 years (1925-30), 36.6 cfs.

Extremes.--1925-31: Maximum observed discharge, 800 cfs Nov. 16, 1926 (gage height, 8.80 ft); minimum, 1.3 cfs Sept. 28, 1930 (gage height, 0.94 ft).

Magnitude and frequency of annual low flow

(Based on correlation with 1-6505 Northwest Branch Anacostia River near Colesville, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	7.8	2.6	1.0	-	-

Duration of daily flow

(Based on period Oct. 1, 1925, to Sept. 30, 1930)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
290	200	140	85	60	47	40	30	23	18	13	5.5	2.6	2.2	1.9	1.5

1-6450. Seneca Creek at Dawsonville, Md.

Location.--Lat 39°07'41", long 77°20'13", on right bank 60 ft downstream from bridge on State Highway 28, 150 ft downstream from Great Seneca Creek, half a mile east of Dawsonville, Montgomery County, and 5.8 miles upstream from mouth.

Drainage area.--101 sq mi.

Records available.--September 1930 to September 1967.

Gage.--Water-stage recorder. Concrete control since Mar. 3, 1934. Datum of gage is 214.15 ft above mean sea level, adjustment of 1912. Sept. 26 to Nov. 9, 1930, chain gage and Nov. 10, 1930, to Apr. 6, 1934, water-stage recorder, at highway bridge 60 ft upstream at same datum, Apr. 7, 1934, to June 27, 1967, graphic water-stage recorder at present site and datum.

Average discharge.--37 years, 90.4 cfs.

Extremes.--1930-67: Maximum discharge, 15,000 cfs July 21, 1956 (gage height, 12.17 ft), from rating curve extended above 2,700 cfs on basis of contracted-opening and flow-over-road measurement at gage height 9.78 ft; minimum, 1.8 cfs Sept. 12-13, 1966 (gage height, 1.54 ft).

Remarks.--Small diversion at times for irrigation above station.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1930, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,090	3,450	4,890	7,630	10,600	(14,600)
Daily flow	1,190	1,810	2,290	2,960	3,510	-
3-day flow	651	967	1,180	1,460	1,680	-
7-day flow	418	591	689	797	867	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1931, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	20	9.0	5.6	3.8	-
14-day	23	10	6.4	4.0	-
30-day	27	13	9.0	7.0	-
60-day	32	17	13	9.6	-
90-day	34	22	17	14	-
120-day	39	26	21	17	-

Duration of daily flow

(Based on period Oct. 1, 1930, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
880	600	410	240	160	120	92	60	40	32	23	16	11	7.4	5.2	3.2

1-6452. Watts Branch at Rockville, Md.

Location.--Lat 39°05'03", long 77°10'38", on left bank 0.2 mile south of State Highway 28, 1.3 miles west of post office in Rockville, Montgomery County, and 9.4 miles upstream from mouth.

Drainage area.--3.70 sq mi.

Records available.--June 1957 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 330 ft (from topographic map). Prior to Oct. 1, 1960, graphic water-stage recorder at same site and datum.

Average discharge.--10 years, 3.17 cfs.

Extremes.--1957-67: Maximum discharge, 1,230 cfs Aug. 4, 1967 (gage height, 5.58 ft) from rating curve extended above 660 cfs on basis of velocity-area studies; minimum, 0.10 cfs Sept. 2, 1966 (gage height, 1.10 ft).

Remarks.--Some regulation of low flow from unknown cause. Records are affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	471	848	1,130	(1,530)	(1,840)	(2,160)
Daily flow	87	130	160	-	-	-
3-day flow	38	52	63	-	-	-
7-day flow	20	26	30	-	-	-

Magnitude and frequency of annual low flow

(Based on correlation with 1-6480 Rock Creek at Sherrill Drive, Washington, D. C.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.6	0.2	0.1	0.1	-

Duration of daily flow

(Based on period Oct. 1, 1957, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
44	29	18	9.0	5.3	3.4	2.7	1.8	1.2	0.9	0.7	0.5	0.4	0.3	0.2	0.1

1-6465. Potomac River near Washington, D. C.

Location.--Lat 38°56'58", long 77°07'40", on left bank just above Little Falls Dam, 1 mile upstream from District of Columbia boundary line, 1 1/4 miles upstream from Chain Bridge, and 117 miles upstream from mouth.

Drainage area.--11,560 sq mi.

Records available.--March 1930 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 37.95 ft above mean sea level, datum of 1929. Prior to June 7, 1930, staff gage at site 1 mile upstream on right bank at same datum. June 7, 1930, to Jan. 22, 1965, graphic water-stage recorder at site 1 mile upstream on right bank at same datum.

Average discharge.--37 years, 10,790 cfs (adjusted for diversions).

Extremes.--1930-67: Maximum discharge, 484,000 cfs Mar. 19, 1936 (gage height, 28.1 ft, site then in use); minimum daily observed at gaging station, 121 cfs Sept. 9, 1966 (does not include diversion of 489 cfs for municipal use); minimum daily (adjusted) 601 cfs Sept. 10, 1966 (includes diversion of 449 cfs for municipal use).
Flood of June 2, 1889, was of approximately the same magnitude as that of March 19, 1936.

Remarks.--Diversions at Great Falls through aqueducts, and since June 1959, from gage pool at Little Falls Dam, for municipal supply of Washington, D. C.; since October 1958, at Rockville Filtration Plant, for municipal supply of city of Rockville; since April 1961, at Potomac Filtration Plant, for water supply of Washington Suburban Sanitary District; since October 1961, at Fairfax Water Treatment Plant for water supply of city of Fairfax (from Goose Creek); and since April 1964, at Violets Lock, to Chesapeake and Ohio Canal. Low flow affected slightly by Stony River Reservoir (see sta. no. 1-5955) and since December 1950, by Savage River Reservoir (see sta. no. 1-5975). Low flow affected extensively at times by run-of-the-river hydroelectric plants.

Magnitude and frequency of annual high flow[a]

(Based on period Oct. 1, 1930, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	110,000	179,000	240,000	336,000	425,000	(529,000)
Daily flow	101,000	166,000	221,000	307,000	385,000	-
3-day flow	81,300	129,000	168,000	226,000	277,000	-
7-day flow	57,000	85,400	107,000	136,000	160,000	-

[a]Diversions not significant at high-flow magnitudes

Magnitude and frequency of annual low flow

(Based on observed flow during the period Apr. 1, 1930, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1,330	783	560	411	-
14-day	1,410	840	611	457	-
30-day	1,560	983	762	614	-
60-day	1,970	1,180	889	701	-
90-day	2,320	1,390	1,070	860	-
120-day	2,780	1,720	1,320	1,070	-

1-6465. Potomac River near Washington, D. C.--Continued

Magnitude and frequency of annual low flow

(Based on adjusted flow during the period Apr. 1, 1930, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	1,620	1,150	950	810	-
14-day	1,700	1,210	1,000	860	-
30-day	1,890	1,340	1,130	980	-
60-day	2,300	1,540	1,260	1,070	-
90-day	2,660	1,740	1,420	1,210	-
120-day	3,110	2,060	1,670	1,400	-

Duration of daily flow

(Based on observed flow during the period Oct. 1, 1930, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
89,000	69,000	52,000	34,000	23,000	15,000	10,500	6,000	3,300	2,400	1,600	1,200	850	700	540	280

(Based on adjusted flow during the period Oct. 1, 1930, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
89,000	69,000	52,000	34,000	23,000	15,000	10,800	6,200	3,600	2,800	2,000	1,500	1,200	1,030	880	750

1-6465.5. Little Falls Branch near Bethesda, Md.

Location.--Lat 39°57'27", long 77°06'31", on left bank at downstream side of bridge on Massachusetts Avenue, 0.3 mile downstream from Willett Branch, 1.7 miles upstream from mouth, and 2.0 miles southwest of Bethesda, Montgomery County.

Drainage area.--4.1 sq mi, approximately.

Records available.--June 1944 to September 1959. Annual maximum only for water years 1960-61. Occasional low-flow measurements water years 1960-62, December 1961 to September 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 169.32 ft above mean sea level (Maryland State Roads Commission bench mark). Prior to Oct. 1, 1959, water-stage recorder and concrete control at site 50 ft upstream at same datum. Oct. 1, 1959, to Nov. 30, 1961, crest-stage gage at present site and datum.

Average discharge.--20 years (1945-59, 1963-67), 3.17 cfs.

Extremes.--1944-67: Maximum discharge, 2,680 cfs Sept. 14, 1966 (gage height, 6.82 ft), from rating curve extended above 630 cfs on basis of slope-area measurement at gage height 5.92 ft; no flow at times in 1944, 1954, 1959, minima not available Oct. 1959 to Nov. 1961.

Remarks.--Occasional slight regulation at low flow from unknown source above station. Records are affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	1,120	1,650	2,040	2,560	(2,980)	(3,420)
Daily flow	93	145	182	231	-	-
3-day flow	39	61	79	105	-	-
7-day flow	21	33	41	54	-	-

*Based on water years 1945-60, 1962-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1945, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.2	0.1	0.1	0	0
14-day	.2	.1	.1	.1	-
30-day	.4	.3	.2	.2	-
60-day	.7	.5	.4	.3	-
90-day	1.0	.7	.6	.5	-
120-day	1.3	.9	.8	.7	-

Duration of daily flow

(Based on period Oct. 1, 1944, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time														
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
62	40	25	13	6.0	2.9	1.9	1.0	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0

1-6480. Rock Creek at Sherrill Drive, Washington, D. C.

Location.--Lat 38°58'21", long 77°02'25", on left bank 125 ft downstream from Sherrill Drive Bridge in Rock Creek Park in Washington, and 7 1/2 miles upstream from mouth.

Drainage area.--62.2 sq mi.

Records available.--October 1929 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 148.87 ft above mean sea level, datum of 1929. Prior to Mar. 18, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--38 years, 55.5 cfs.

Extremes.--1929-67: Maximum discharge, 7,220 cfs July 21, 1956 (gage height, 13.19 ft, from high-water mark in gage house), from rating curve extended above 4,400 cfs on basis of contracted-opening measurement of peak flow; minimum, 0.5 cfs Oct. 1-7, 1930 (gage height, 1.04 ft).

Remarks.--Flow affected during water years 1965-67 by construction of reservoirs upstream; Needwood Lake on Rock Creek and Lake Frank on North Branch Rock Creek. Records are affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,490	2,460	3,250	4,450	5,480	(6,650)
Daily flow	948	1,490	1,870	2,350	2,720	-
3-day flow	471	711	872	1,070	1,220	-
7-day flow	283	406	479	562	618	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1930, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	8.4	3.7	2.2	1.4	-
14-day	9.9	4.6	2.8	1.8	-
30-day	13	6.5	4.2	2.9	-
60-day	18	9.7	6.5	4.4	-
90-day	21	12	7.7	5.3	-
120-day	25	14	10	7.0	-

Duration of daily flow

(Based on period Oct. 1, 1929, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
650	420	290	150	100	68	53	35	23	18	11	7.2	4.1	2.7	1.8	1.0

1-6495. Northeast Branch Anacostia River at Riverdale, Md.

Location.--Lat 38°57'37", long 76°55'34", on right bank at downstream side of bridge on Riverdale Road in Riverdale, Prince Georges County, 1 3/4 miles downstream from Indian Creek, and 1 3/4 miles upstream from confluence with Northwest Branch.

Drainage area.--72.8 sq mi.

Records available.--August 1938 to September 1967.

Gage.--Staff gage 600 ft downstream from bridge Oct. 1 to Apr. 11, at datum 9.25 ft above mean sea level. Digital water-stage recorder. Datum of gage is 14.00 ft above mean sea level. Mar. 23, 1966, to Apr. 11, 1967, staff gage 600 ft downstream from bridge at datum 9.25 ft above mean sea level (Washington Suburban Sanitary Commission bench mark).

Average discharge.--29 years, 75.9 cfs.

Extremes.--1938-67: Maximum discharge, 5,060 cfs Aug. 20, 1963 (gage height, 6.98 ft), from rating curve extended above 2,100 cfs by logarithmic plotting; maximum gage height, 12.93 ft Oct. 16, 1942; minimum daily discharge, 1.4 cfs Sept. 12, 1966.
Maximum stage known, about 15.5 ft Aug. 23 or 24, 1933, from floodmarks (discharge, 10,500 cfs from rating curve extended above 3,000 cfs on basis of velocity-area study).

Remarks.--Some regulation at low flow by sand and gravel plants above station. Records affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1938, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	2,300	3,570	4,610	6,180	7,570	(9,140)
Daily flow	1,430	2,000	2,320	2,690	2,920	-
3-day flow	795	1,090	1,270	1,470	1,600	-
7-day flow	453	620	723	847	935	-

*Based on water years 1933, 1939-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1939, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	11	6.6	4.8	3.6	-
14-day	13	8.0	6.0	4.7	-
30-day	16	10	7.8	6.3	-
60-day	21	14	11	8.6	-
90-day	26	17	14	11	-
120-day	30	21	18	16	-

Duration of daily flow

(Based on period Oct. 1, 1938, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
930	620	430	240	150	91	68	42	27	22	16	12	8.6	7.0	5.3	3.0

1-6505. Northwest Branch Anacostia River near Colesville, Md.

Location.--Lat 39°03'55", long 77°01'48", on right bank 400 ft upstream from bridge on State Highway 183, 1 1/2 miles southwest of Colesville, Montgomery County, 10 miles upstream from Sligo Branch, and 12 1/2 miles upstream from mouth.

Drainage area.--21.1 sq mi.

Records available.--October 1923 to September 1967. Monthly discharge only for some periods, published in WSP 1302.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 264.85 ft above mean sea level, adjustment of 1912. Prior to Apr. 22, 1932, staff gages in same general vicinity at different datums. Apr. 22, 1932, to Apr. 11, 1934, staff gage and Apr. 11, 1934, to Oct. 3, 1962, graphic water-stage recorder, at same site and datum.

Average discharge.--44 years, 21.5 cfs (unadjusted).

Extremes.--1924-1967: Maximum discharge, 4,910 cfs Aug. 8, 1953 (gage height, 10.99 ft), from rating curve extended above 1,200 cfs on basis of contracted-opening and flow-over-road measurement of peak flow; minimum, no flow on several days during August and September 1966.

Remarks.--Inflow pumped from Patuxent River to augment water supply for Washington Suburban Sanitary District August 1939 to August 1960. Diversions at low flow since 1962 for irrigation of golf courses above station. Records affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1924, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	1,200	1,980	2,680	3,800	4,860	(6,130)
Daily flow	390	620	830	1,100	1,300	-
3-day flow	185	260	340	450	560	-
7-day flow	106	158	200	250	290	-

*Based on water years 1924-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1924, to Mar. 31, 1939, and Apr. 1, 1961, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.0	1.0	0.4	0.2	-
14-day	3.4	1.1	.5	.2	-
30-day	4.1	1.8	.9	.4	-
60-day	5.6	2.4	1.3	.6	-
90-day	6.6	3.1	1.9	1.2	-
120-day	8.0	4.2	2.6	1.7	-

1-6505. Northwest Branch Anacostia River near Colesville, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1924, to Sept. 30, 1939, and Oct. 1, 1961, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
280	190	120	55	32	22	17	12	7.7	5.5	3.7	2.5	1.3	1.0	0.8	0

(Based on regulated period Oct. 1, 1939, to Sept. 30, 1960)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
270	180	120	59	35	23	20	15	12	10	7.8	6.0	4.1	3.0	2.0	1.1

1-6510. Northwest Branch Anacostia River near Hyattsville, Md.

Location.--Lat 38°57'09", long 76°58'00", on right bank at downstream side of bridge on Queens Chapel Road (State Highway 500), 0.8 mile downstream from Sligo Branch, 1 mile west of Hyattsville, Prince Georges County, and 1.6 miles upstream from mouth.

Drainage area.--49.4 sq mi.

Records available.--July 1938 to September 1967. Monthly discharge only for July 1938 published in WSP 1302.

Gage.--Digital water-stage recorder. Datum of gage is 17.30 ft above mean sea level, adjustment of 1912. Prior to Oct. 22, 1938, wire-weight gage; Oct. 22, 1938, to Sept. 17, 1951, graphic water-stage recorder; Sept. 17, 1951, to Aug. 29, 1952, staff gage and crest-stage gage; Aug. 30, 1952, to Sept. 30, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--29 years, 39.5 cfs (unadjusted).

Extremes.--1938-67: Maximum discharge, 7,000 cfs Sept. 14, 1966 (gage height, 13.50 ft); minimum, 0.2 cfs Sept. 11, 1966.
Maximum stage known, about 13.5 ft Aug. 24, 1933, and Sept. 14, 1966.

Remarks.--Prior to June 1961, low flow regulated by storage at Burnt Mills Dam, 7 miles above station. Inflow pumped from Patuxent River to augment water supply for Washington Suburban Sanitary District, August 1939 to August 1960. Small diversion since 1962 for irrigation of golf courses above station. Records affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1939, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	2,280	3,300	4,090	5,220	6,160	(7,200)
Daily flow	890	1,300	1,650	2,200	2,700	-
3-day flow	420	620	800	1,100	1,350	-
7-day flow	230	350	440	600	740	-

*Based on water years 1939-67

Magnitude and frequency of annual low flow

(Based on correlation with 1-6495 Northeast Branch Anacostia River at Riverdale, Md.)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day 14-day 30-day 60-day 90-day 120-day	5.5	3.0	2.0	1.4	-

1-6510. Northwest Branch Anacostia River near Hyattsville, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1960, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
600	400	280	140	77	47	33	21	13	9.2	6.4	4.4	2.7	1.9	1.4	0.6

(Based on regulated period Oct. 1, 1939, to Sept. 30, 1960)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
580	420	260	130	75	43	32	19	11	7.6	5.4	3.9	2.9	2.4	2.1	1.4

1-6535. Henson Creek at Oxon Hill, Md.

Location.--Lat 38°47'16", long 76°58'42", on left bank 100 ft downstream from bridge on Tucker Road, 1.0 mile south of Oxon Hill, Prince Georges County, 1.4 miles upstream from mouth.

Drainage area.--16.7 sq mi.

Records available.--June 1948 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 62 ft (from topographic map). Prior to Oct. 1, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--19 years, 18.3 cfs.

Extremes.--1948-67: Maximum discharge, 3,000 cfs Aug. 13, 1955 (gage height, 7.33 ft), from rating curve extended above 520 cfs on basis of slope-area measurements at gage heights 6.63 and 7.27 ft; no flow at times during some summer months in 1954, 1955, 1957, 1962-64, and 1966.

Remarks.--Some diversion above station for irrigation of truck farm. Some regulation at low flow by sand and gravel plant above station. Records affected by urban development.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,050	1,740	2,300	3,170	(3,920)	(4,780)
Daily flow	423	689	882	1,140	-	-
3-day flow	188	297	385	515	-	-
7-day flow	102	158	204	270	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1949, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.9	0.1	0	0	-
14-day	1.1	.3	.1	.1	-
30-day	1.5	.5	.3	.2	-
60-day	3.5	1.4	.9	.5	-
90-day	4.8	2.4	1.7	1.2	-
120-day	6.0	3.4	2.4	1.8	-

Duration of daily flow

(Based on period Oct. 1, 1948, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
220	150	98	54	35	23	18	10	5.5	3.7	2.2	1.2	0.3	0.1	0	0

1-6580. Mattawoman Creek near Pomonkey, Md.

Location.--Lat 38°35'45", long 77°03'25", on left bank 50 ft downstream from bridge on State Highway 227, 80 ft downstream from Old Womans Run, 1.2 miles southeast of Pomonkey, Charles County, and 12.6 miles upstream from mouth.

Drainage area.--57.7 sq mi.

Records available.--November 1949 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 40 ft (from topographic map). Prior to Oct. 30, 1963, graphic water-stage recorder at same site and datum.

Average discharge.--17 years (1950-67), 52.7 cfs.

Extremes.--1949-67: Maximum discharge, 9,300 cfs Aug. 13, 1955 (gage height, 7.52 ft), from rating curve extended above 6,000 cfs; no flow at times each year.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	904	1,960	3,180	5,670	(8,540)	(12,700)
Daily flow	720	1,420	2,180	3,670	-	-
3-day flow	554	937	1,290	1,870	-	-
7-day flow	352	581	787	1,120	-	-

*Based on water years 1950-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1950, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0	0	0	0	0
14-day	0	0	0	0	0
30-day	.2	0	0	0	0
60-day	.9	0	0	0	0
90-day	1.6	0	0	0	0
120-day	6.7	1.9	.9	-	-

Duration of daily flow

(Based on period Oct. 1, 1950, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
630	490	370	200	120	72	47	22	4.8	1.1	0	0	0	0	0	0

1-6610. Chaptico Creek at Chaptico, Md.

Location.--Lat 38°22'45", long 76°46'56", on right bank at downstream side of highway culvert, 0.8 mile north of Chaptico, St. Marys County, and 0.8 mile upstream from Chaptico Bay.

Drainage area.--10.7 sq mi.

Records available.--June 1947 to September 1967.

Gage.--Digital water-stage recorder. Concrete control prior to Oct. 25, 1961. Altitude of gage is 15 ft (from topographic map). Prior to Mar. 12, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 9.90 cfs.

Extremes.--1947-67: Maximum discharge, 7,800 cfs Sept. 10, 1950 (gage height, 8.56 ft), from rating curve extended above 410 cfs on basis of slope-area measurement of peak flow; no flow at times in 1954, 1955, 1957, 1962-64, and 1966.

Remarks.--Occasional small diversion above station for irrigation.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	294	467	700	1,300	(2,100)	(3,320)
Daily flow	139	252	391	693	-	-
3-day flow	67	121	184	318	-	-
7-day flow	42	72	104	165	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.5	0	0	0	0
14-day	.6	.1	0	0	0
30-day	1.1	.3	.1	0	0
60-day	1.8	.6	.3	.2	-
90-day	2.5	1.2	.7	.5	-
120-day	3.4	1.6	1.1	.7	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
100	70	45	27	20	14	10	6.5	3.6	2.3	1.2	0.4	0	0	0	0

1-6615. St. Marys River at Great Mills, Md.

Location.--Lat 38°14'36", long 76°30'13", on left bank at downstream side of bridge on State Highway 471 in Great Mills, St. Marys County, 0.3 mile downstream from Western Branch, and 12.0 miles upstream from mouth.

Drainage area.--24.0 sq mi.

Records available.--June 1946 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map). Prior to Oct. 1, 1963, graphic water-stage recorder at same site and datum.

Average discharge.--21 years, 23.3 cfs.

Extremes.--1946-67: Maximum discharge, 4,900 cfs July 30, 1960 (gage height, 12.08 ft), from rating curve extended above 1,500 cfs on basis of contracted-opening measurement of peak flow; minimum, 0.2 cfs Sept. 7, 1966 (gage height, 1.13 ft).

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	685	1,320	1,940	3,040	(4,140)	(5,560)
Daily flow	435	900	1,440	2,550	-	-
3-day flow	245	450	650	1,000	-	-
7-day flow	136	190	335	475	-	-

*Based on water years 1947-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1947, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	2.8	1.6	1.2	0.8	-
14-day	3.4	1.9	1.3	.9	-
30-day	3.9	2.3	1.6	1.2	-
60-day	4.9	3.0	2.4	2.0	-
90-day	6.2	4.0	3.3	2.8	-
120-day	7.4	4.8	3.9	3.4	-

Duration of daily flow

(Based on period Oct. 1, 1946, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
290	210	130	80	46	27	20	12	6.9	5.2	3.6	2.7	2.1	1.7	1.4	0.5

3-0755. Youghiogheny River near Oakland, Md.

Location.--Lat 39°25'19", long 79°25'32", on left bank 200 ft downstream from Baltimore and Ohio Railroad bridge, 250 ft downstream from Little Youghiogheny River, and 1 1/4 miles northwest of Oakland, Garrett County.

Drainage area.--134 sq mi.

Records available.--August 1941 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 2,353.11 ft above mean sea level, unadjusted. Prior to Aug. 1, 1946, wire-weight gage at bridge 200 ft upstream at same datum. Aug. 2, 1946, to Sept. 19, 1960, graphic water-stage recorder at present site and datum.

Average discharge.--26 years, 285 cfs.

Extremes.--1941-67: Maximum discharge, 11,800 cfs Oct. 16, 1954 (gage height, 12.16 ft); minimum daily, 2.5 cfs Oct. 4, 1953.
Flood in March 1936 reached a stage of 15.3 ft, from floodmarks.

Remarks.--Town of Oakland diverted an average of 0.4 cfs for water supply. The diversion is returned above station as sewage.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1941, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	4,330	6,630	8,330	10,700	12,500	(14,200)
Daily flow	3,410	5,140	6,430	8,230	9,690	-
3-day flow	2,410	3,360	4,000	4,820	5,450	-
7-day flow	1,640	2,160	2,470	2,840	3,090	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1942, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	12	6.1	4.3	3.2	-
14-day	14	6.9	4.9	3.7	-
30-day	17	9.4	6.8	5.2	-
60-day	28	14	9.6	7.1	-
90-day	39	19	12	8.6	-
120-day	53	26	17	12	-

Duration of daily flow

(Based on period Oct. 1, 1941, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
2,600	2,000	1,500	1,000	680	420	280	150	67	38	18	11	7.0	5.2	4.3	3.2

MONONGAHELA RIVER BASIN

3-0765. Youghiogheny River at Friendsville, Md.

Location.--Lat 39°39'13", long 79°24'31", on left bank 0.7 mile upstream from bridge on State Highway 42 at Friendsville, Garrett County, and 1 1/2 miles upstream from Bear Creek.

Drainage area.--295 sq mi.

Records available.--August 1898 to December 1904 and October 1940 to September 1967 in reports of Geological Survey. October, November 1940 monthly discharge only, published in WSP 1305. September 1922 to September 1926 (gage heights only) in reports of Pennsylvania Department of Forests and Waters.

Gage.--Digital water-stage recorder. Datum of gage is 1,487.33 ft above mean sea level, datum of 1929. Aug. 17, 1898, to Dec. 31, 1904, and Sept. 1, 1922, to Sept. 30, 1926, wire-weight and chain gages at bridge 0.7 mile downstream at datum 16.24 and 16.29 ft lower, respectively. Dec. 4, 1940, to Sept. 19, 1960, graphic water-stage recorder at present site and datum.

Average discharge.--33 years (1898-1904, 1940-67), 630 cfs (adjusted for storage since 1940).

Extremes.--1898-1904, 1940-67: Maximum discharge, 13,000 cfs Oct. 16, 1954 (gage height, 8.99 ft), from rating curve extended above 5,800 cfs on basis of slope-area measurement of peak flow; minimum daily, 8.2 cfs Sept. 11, 1966.
Maximum stage known, 14.2 ft Mar. 29, 1924, from floodmarks, site amd datum then in use, or 10.2 ft, present site and datum (discharge, about 15,600 cfs, from rating curve extended on basis of slope-area measurement for peak of Oct. 16, 1954).

Remarks.--Low and medium flow regulated since 1925 by Deep Creek Reservoir (capacity 106,060 acre-feet of which 92,975 acre-feet is controlled storage). Reservoir is used for hydro-electric power.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1941, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow*	6,700	9,220	10,800	12,600	13,800	(15,000)
Daily flow	5,350	7,480	8,880	10,700	12,000	-
3-day flow	4,030	5,320	6,050	6,870	7,400	-
7-day flow	2,820	3,590	3,980	4,390	4,640	-

*Based on water years 1940-67

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1942, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	84	55	47	42	-
14-day	98	65	55	48	-
30-day	130	80	65	56	-
60-day	170	100	78	64	-
90-day	190	110	84	70	-
120-day	203	130	105	85	-

3-0765. Youghiogheny River at Friendsville, Md.--Continued

Duration of daily flow

(Based on period Oct. 1, 1941, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
4,500	3,500	2,700	1,850	1,300	850	630	380	230	170	110	75	48	33	24	15

3-0780. Casselman River at Grantsville, Md.

Location.--Lat 39°42'08", long 79°08'12", on left bank at downstream side of highway bridge, 0.3 mile upstream from Slaubough Run, and 1.0 mile northeast of Grantsville, Garrett County.

Drainage area.--62.5 sq mi.

Records available.--July 1947 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 2,090 ft (from topographic map). Prior to Oct. 24, 1960, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 113 cfs.

Extremes.--1947-67: Maximum discharge, 8,400 cfs Oct. 15, 1954 (gage height, 10.70 ft), from rating curve extended above 1,600 cfs on basis of contracted-opening measurement at gage height 8.13 ft and logarithmic plotting; no flow Aug. 31, 1962, result of regulation from unknown source.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	2,140	3,330	4,400	6,160	(7,820)	(9,850)
Daily flow	1,470	1,960	2,270	2,630	-	-
3-day flow	1,020	1,370	1,590	1,850	-	-
7-day flow	716	944	1,080	1,230	-	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1948, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	3.0	1.4	1.0	0.7	-
14-day	3.8	1.7	1.2	.9	-
30-day	5.4	2.6	1.8	1.3	-
60-day	8.2	4.0	2.8	2.1	-
90-day	11	5.6	3.9	2.8	-
120-day	15	7.6	5.2	3.8	-

Duration of daily flow

(Based on period Oct. 1, 1947, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
1,150	830	620	400	270	170	115	55	22	12	5.3	3.2	2.0	1.4	1.2	1.0

3-0785. Big Piney Run near Salisbury, Pa.

Location.--Lat 39°43'32", long 79°02'57", on left bank an eighth of a mile upstream from Little Piney Run, a quarter of a mile north of Maryland-Pennsylvania State line, and 2 1/2 miles southeast of Salisbury, Somerset County, Pa.

Drainage area.--24.5 sq mi.

Records available.--June 1932 to September 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 2,240 ft (from topographic map). Prior to Oct. 25, 1961, graphic water-stage recorder at same site and datum.

Average discharge.--35 years, 37.4 cfs (unadjusted).

Extremes.--1932-67: Maximum discharge, 6,850 cfs Oct. 15, 1954 (gage height, 8.56 ft), from rating curve extended above 500 cfs on basis of slope-area measurement of peak flow; maximum gage height, 8.87 ft Feb. 22, 1944 (ice jam); minimum, 0.04 cfs Sept. 10, 11, 1966 (gage height, 0.95 ft).

Remarks.--Infrequent regulation at low flow by Frostburg Reservoir. Records do not include an average of about 0.5 cfs diverted three miles above station through pumps to city of Frostburg, Maryland, and about 0.2 cfs from spring 700 ft above station by gravity to city of Salisbury, Pennsylvania.

Magnitude and frequency of annual high flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Annual maximum	Discharge, in cfs, for indicated recurrence interval, in years					
	2-year	5-year	10-year	25-year	50-year	100-year
Peak flow	1,030	1,860	2,670	4,080	5,480	(7,250)
Daily flow	580	1,000	1,430	2,300	3,250	-
3-day flow	375	642	880	1,310	1,800	-
7-day flow	240	405	570	860	1,150	-

Magnitude and frequency of annual low flow

(Based on period Apr. 1, 1933, to Mar. 31, 1967)

Annual minimum	Discharge, in cfs, for indicated recurrence interval, in years				
	2-year	5-year	10-year	20-year	50-year
7-day	0.4	0.2	0.1	0.1	-
14-day	.6	.2	.1	.1	-
30-day	.9	.3	.2	.2	-
60-day	1.9	.5	.3	.3	-
90-day	2.7	.8	.5	.4	-
120-day	3.8	1.5	.9	.6	-

Duration of daily flow

(Based on period Oct. 1, 1932, to Sept. 30, 1967)

Discharge, in cfs, which was equalled or exceeded for indicated percent of time															
0.5%	1%	2%	5%	10%	20%	30%	50%	70%	80%	90%	95%	98%	99%	99.5%	99.9%
460	325	220	140	91	53	34	16	5.6	3.0	1.1	0.5	0.3	0.2	0.2	0.1

APPENDIX II
FLOW CHARACTERISTICS
FOR SHORT-TERM GAGING STATIONS

CHOPTANK RIVER BASIN

1-4911.8. Watts Creek near Denton, Md.

Location.--Lat 38°52'29", long 75°47'38", at bridge on State Highway 474, 1.6 miles southeast of Denton, Caroline County.

Drainage area.--11 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.8 cfs	0.4 cfs	0.3 cfs

Basis of estimate.--Correlated with 1-4885, Marshy Hope Creek near Adamsville, Del., using seven discharge measurements made in the period 1964-67.

CHESTER RIVER BASIN

1-4929.8. Cypress Branch at Millington, Md.

Location.--Lat 39°15'28", long 75°50'01", at bridge on State Highway 291, at Millington, Kent County.

Drainage area.--38 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	2.6 cfs	1.0 cfs	0.7 cfs

Basis of estimate.--Correlated with 1-4935, Morgan Creek near Kennedyville, Md., using five discharge measurements made in the period 1964-66.

1-4941. Old Mill Stream Branch at Centreville, Md.

Location.--Lat 39°02'23", long 76°04'22", at bridge on U.S. Highway 213, at Centreville, Queen Annes County.

Drainage area.--11.2 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.0 cfs	2.5 cfs	1.9 cfs

Basis of estimate.--Correlated with 1-4930, Unicorn Branch near Millington, Md., using 29 discharge measurements made in the periods 1952-53, 1964-67.

ELK RIVER BASIN

1-4955.5. Perch Creek near Elkton, Md.

Location.--Lat 39°34'16", long 75°48'53", at bridge on U.S. Highway 213, 2.5 miles south of Elkton, Cecil County.

Drainage area.--6.0 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.9 cfs	0.4 cfs	0.3 cfs

Basis of estimate.--Correlated with 1-4960, Northeast Creek at Leslie, Md., using six discharge measurements made in the period 1964-67.

NORTHEAST RIVER BASIN

1-4960.5. Little Northeast Creek at Mechanic Valley, Md.

Location.--Lat 39°38'26", long 75°55'49", at highway bridge, 0.8 mile northwest of Mechanic Valley, Cecil County.

Drainage area.--14 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	2.8 cfs	1.1 cfs	0.8 cfs

Basis of estimate.--Correlated with 1-4960, Northeast Creek at Leslie, Md., using five discharge measurements made in the period 1964-67.

SUSQUEHANNA RIVER BASIN

1-5779.5. Broad Creek at Pylesville, Md.

Location.--Lat 39°41'16", long 76°22'24", 400 ft below bridge on old State Highway 165, at Pylesville, Harford County.

Drainage area.--11.3 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.3 cfs	1.8 cfs	1.3 cfs

Basis of estimate.--Correlated with 1-5800, Deer Creek at Rocks, Md., using 11 discharge measurements made in the periods 1956-59, 1962-63, 1966.

SWAN CREEK BASIN

1-5807. Swan Creek at Swan Creek, Md.

Location.--Lat 39°31'21", long 76°08'33", at bridge on U.S. Highway 40, at Swan Creek, Harford County.

Drainage area.--13.2 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	1.2 cfs	0.5 cfs	0.4 cfs

Basis of estimate.--Correlated with 1-4960, Northeast Creek at Leslie, Md., using 11 discharge measurements made during the periods 1956-59, 1962-63, 1966.

BUSH RIVER BASIN

1-5816. Bynum Run at Bush, Md.

Location.--Lat 39°28'19", long 76°16'01", at bridge on State Highway 7, 0.2 mile southwest of Bush, Harford County.

Drainage area.--22.5 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.5 cfs	1.6 cfs	1.2 cfs

Basis of estimate.--Correlated with 1-5815, Bynum Run at Bel Air, Md., using 11 discharge measurements made in the periods 1956-59, 1962-63, 1966.

1-5816.5. James Run at Bush, Md.

Location.--Lat 39°28'35", long 76°15'38", at bridge on State Highway 7, 0.2 mile northeast of Bush, Harford County.

Drainage area.--11.1 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.8 cfs	0.2 cfs	0.1 cfs

Basis of estimate.--Correlated with 1-5815, Bynum Run at Bel Air, Md., using 11 discharge measurements made in the periods 1956-59, 1962-63, 1966.

1-5816.6. Grays Run at Stepney, Md.

Location.--Lat 39°29'18", long 76°12'52", at bridge on State Highway 7, 0.9 mile west of Stepney, Harford County.

Drainage area.--5.35 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.1 cfs	0 cfs	0 cfs

Basis of estimate.--Correlated with 1-4960, Northeast Creek at Leslie, Md., using eight discharge measurements made in the periods 1956-59, 1962-63, 1966, and observations of no flow in 1957 and 1966.

1-5817.5. Winters Run near Bel Air, Md.

Location.--Lat 39°30'55", long 76°22'10", at bridge on U.S. Highway 1, 1.5 miles southwest of Bel Air, Harford County.

Drainage area.--37.0 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	13 cfs	6.2 cfs	4.7 cfs

Basis of estimate.--Correlated with 1-5845, Little Gunpowder Falls at Laurel Brook, Md., using 15 discharge measurements made in periods 1954, 1956-59, 1962-63, 1966.

GUNPOWDER RIVER BASIN

1-5818.5. Georges Run at Armacost, Md.

Location.--Lat 39°36'55", long 76°47'26", at bridge on State Highway 25 below Beckleysville Road, 0.7 mile northeast of Armacost, Baltimore County.

Drainage area.--13.0 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	3.9 cfs	1.6 cfs	1.1 cfs

Basis of estimate.--Correlated with 1-5820, Little Falls at Blue Mount, Md., using 10 discharge measurements made in the periods 1956-59, 1962, 1966.

1-5832. Blackrock Run at Coopersville, Md.

Location.--Lat 39°32'36", long 76°44'00", at bridge on State Highway 401, 0.5 mile southeast of Coopersville, Baltimore County.

Drainage area.--9.38 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	3.9 cfs	1.4 cfs	1.0 cfs

Basis of estimate.--Correlated with 1-5835, Western Run at Western Run, Md., using 11 discharge measurements made in the period 1956-59, 1962-63, 1966.

1-5835.8. Baisman Run at Broadmoor, Md.

Location.--Lat 39°28'45", long 76°40'42", on right bank at upstream side of bridge on Ivy Hill Road, 0.3 mile upstream from mouth, and 0.6 mile southwest of Brooadmoor, Baltimore County.

Drainage area.--1.47 sq mi.

Records available.--August 1964 to September 1967.

Gage.--Water-stage recorder. Altitude of gage is 350 ft (from topographic map).

Extremes.--1964-67: Maximum discharge, 200 cfs Aug. 27, 1967 (gage height, 3.50 ft), from rating curve extended above 30 cfs on basis of slope-area measurement at gage height 2.87 ft; no flow many days in August and September 1966.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.5 cfs	0.2 cfs	0.1 cfs

Basis of estimate.--Correlated with 1-5835, Western Run at Western Run, Md.

1-5836. Beaverdam Run at Cockeysville, Md.

Location.--Lat 39°29'08", long 76°38'45", at bridge on U.S. Highway 111, at Cockeysville, Baltimore County.

Drainage area.--20.8 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	10 cfs	5.0 cfs	3.8 cfs

Basis of estimate.--Correlated with 1-5835, Western Run at Western Run, Md., using 13 discharge measurements made in the periods 1954-59, 1962-63, 1966.

1-5842. Little Gunpowder Falls at Hess, Md.

Location.--Lat 39°32'37", long 76°31'53", at bridge on State Highway 146, 0.8 mile south of Hess, Baltimore County.

Drainage area.--16.5 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	5.7 cfs	2.9 cfs	2.4 cfs

Basis of estimate.--Correlated with 1-5845, Little Gunpowder Falls at Laurel Brook, Md., using 10 discharge measurements made in the periods 1956-59, 1962-63, 1966.

PATAPSCO RIVER BASIN

1-5862. Beaver Run at Finksburg, Md.

Location.--Lat 39°29'44", long 76°54'09", at highway bridge, 0.7 mile northwest of Finksburg, Carroll County.

Drainage area.--12.7 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.0 cfs	1.5 cfs	1.1 cfs

Basis of estimate.--Correlated with 1-5835, Western Run at Western Run, Md., using 13 discharge measurements made in the periods 1957-59, 1961-63, 1966.

1-5866. Morgan Run near Gamber, Md.

Location.--Lat 39°27'58", long 76°58'16", at bridge on Klees Mill Road, 1.9 miles west of Gamber, Carroll County.

Drainage area.--26.0 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	8.2 cfs	3.2 cfs	2.2 cfs

Basis of estimate.--Correlated with 1-5835, Western Run at Western Run, Md., using 12 discharge measurements made in the periods 1957-59, 1961-63, 1966.

1-5890.9. Stony Run at Elkridge, Md.

Location.--Lat 39°12'43", long 76°41'46", at highway bridge on Elkridge-Patapsco Road, 0.9 mile east of Elkridge, Howard County.

Drainage area.--9.4 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.4 cfs	2.7 cfs	2.3 cfs

Basis of estimate.--Correlated with 1-5900, North River near Annapolis, Md., using 10 discharge measurements made in the periods 1935, 1954-55, 1964-67.

1-5894.4. Jones Falls at Sorrento, Md.

Location.--Lat 39°23'30", long 76°39'42", on right bank 0.3 mile downstream from bridge on State Highway 25 (Falls Road), 0.4 mile downstream from Slaughterhouse Branch and Sorrento, Baltimore County, and 18 miles upstream from mouth.

Drainage area.--25.2 sq mi.

Records available.--Annual maximum, water years 1958-66. April 1966 to September 1967.

Gage.--Water-stage recorder and crest-stage gage. Altitude of gage is 240 ft (from topographic map).

Extremes.--1966-67: Maximum discharge, 1,140 cfs Aug. 27, 1967 (gage height, 7.89 ft); minimum, 1.8 cfs Sept. 7, 8, 1966 (gage height, 1.16 ft).

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	11 cfs	4.5 cfs	3.2 cfs

Basis of estimate.--Correlated with 1-5835, Western Run at Western Run, Md.

SEVERN RIVER BASIN

1-5898. Severn Run at Benfield, Md.

Location.--Lat 39°04'51", long 76°37'36", at bridge on State Highway 3, 0.5 mile south of Benfield, Anne Arundel County.

Drainage area.--24 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	14 cfs	12 cfs	9.2 cfs

Basis of estimate.--Correlated with 1-5900, North River near Annapolis, Md., using nine discharge measurements made in the period 1954-55, 1961, 1964-67.

PATUXENT RIVER BASIN

1-5912. Cattail Creek Tributary at Carrs Mills, Md.

Location.--Lat 39°18'57", long 77°03'41", at bridge on State Highway 96, 0.5 mile west of Carrs Mill, Howard County.

Drainage area.--3.93 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	1.0 cfs	0.3 cfs	0.2 cfs

Basis of estimate.--Correlated with 1-5875, South Branch Patapsco River at Henryton, Md., using 14 discharge measurements made in the periods 1956-59, 1961-63, 1966.

1-5932. Little Patuxent River at Pine Orchard, Md.

Location.--Lat 39°16'42", long 76°51'11", at bridge on U.S. Highway 40, 0.4 mile east of Pine Orchard, Howard County.

Drainage area.--7.03 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	2.0 cfs	0.8 cfs	0.6 cfs

Basis of estimate.--Correlated with 1-5935, Little Patuxent River at Guilford, Md., using 15 discharge measurements made in the periods 1956-59, 1961-63, 1966.

1-5936. Middle Patuxent River near West Friendship, Md.

Location.--Lat 39°17'14", long 76°57'33", at bridge on State Highway 32, 1.1 miles south of West Friendship, Howard County.

Drainage area.--11.4 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	2.7 cfs	1.0 cfs	0.7 cfs

Basis of estimate.--Correlated with 1-5935, Little Patuxent River at Guilford, Md., using 15 discharge measurements made in the periods 1956-59, 1961-63, 1966.

1-5941. Hammond Branch at Scaggsville, Md.

Location.--Lat 39°09'13", long 76°53'35", at bridge on U.S. Highway 29, 0.7 mile northeast of Scaggsville, Howard County.

Drainage area.--3.01 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.9 cfs	0.4 cfs	0.3 cfs

Basis of estimate.--Correlated with 1-5935, Little Patuxent River at Guilford, Md., using 14 discharge measurements made in the periods 1956-59, 1962-63, 1966.

1-5945.25. Collington Branch at Upper Marlboro, Md.

Location.--Lat 38°49'16", long 76°44'40", at railroad bridge, 0.1 mile above mouth at Upper Marlboro, Prince Georges County.

Drainage area.--22.9 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	2.1 cfs	-	-

Basis of estimate.--Correlated with 1-5945, Western Branch near Largo, Md., using five discharge measurements made in the period 1964-66.

1-5945.35. Mataponi Creek near Naylor, Md.

Location.--Lat 38°43'47", long 76°45'18", at bridge on State Highway 382, 1.3 miles northwest of Naylor, Prince Georges County.

Drainage area.--14 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.2 cfs	-	-

Basis of estimate.--Correlated with 1-5946, Cocktown Creek near Huntingtown, Md., using three discharge measurements in the period 1964-66 and an observation of no flow in 1966.

1-5945.45. Lyons Creek at Lyons Creek, Md.

Location.--Lat 38°45'53", long 76°39'27", at bridge on State Highway 4, 0.1 mile east of Lyons Creek, Anne Arundel County.

Drainage area.--15 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	2.0 cfs	0.1 cfs	-

Basis of estimate.--Correlated with 1-5945, Cocktown Creek near Huntingtown, Md., using seven discharge measurements made in the period 1964-67 and an observation of no flow made in 1966.

POTOMAC RIVER BASIN

1-5958. North Branch Potomac River at Barnum, W. Va.

Location.--Lat 39°26'44", long 79°06'39", on left bank at bridge at Barnum, Mineral County, W. Va., and 0.45 mile upstream from Folly Run.

Drainage area.--266 sq mi.

Records available.--July 1966 to September 1967.

Gage.--Water-stage recorder. Altitude of gage is 1,150 ft (from topographic map).

Extremes.--1966-67: Maximum discharge, 12,200 cfs Mar. 7, 1967 (gage height, 9.70 ft); minimum, 18 cfs July 24, 1966 (gage height, 1.80 ft).

Remarks.--Regulation at low flow by Stony River Reservoir, 39 miles above station (see sta. no. 1-5955).

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	26 cfs	11 cfs	-

Basis of estimate.--Correlated with 1-5955, North Branch Potomac River at Kitzmiller, Md.

1-6013. North Branch Jennings Run at Barrelville, Md.

Location.--Lat 39°42'13", long 78°50'38", at bridge on State Highway 47, at Barrelville, Allegany County.

Drainage area.--12 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.5 cfs	0.1 cfs	

Basis of estimate.--Correlated with 1-6015, Wills Creek near Cumberland, Md., using seven discharge measurements made in the period 1964-67.

1-6041.5. Collier Run at Spring Gap, Md.

Location.--Lat 39°34'03", long 78°43'23", at culvert on State Highway 51, 0.6 mile west of Spring Gap, Allegany County.

Drainage area.--11 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.1 cfs	-	-

Basis of estimate.--Correlated with 1-6035, Evitts Creek below Centerville, Pa., using nine discharge measurements made in the period 1964-67.

1-6178. Marsh Run at Grimes, Md.

Location.--Lat 39°30'53", long 77°46'38", on right bank 220 ft upstream from bridge on Sprecher Road, 0.1 mile downstream from unnamed tributary, 0.5 mile southwest of Grimes, Washington County, and 1.5 miles upstream from mouth.

Drainage area.--18.9 sq mi.

Records available.--October 1963 to September 1967.

Gage.--Digital water-stage recorder. Altitude of gage is 360 ft (from topographic map). Prior to July 7, 1967, graphic water-stage recorder at same site and datum.

Extremes.--1963-67: Maximum discharge, 105 cfs Jan. 9, 1964 (gage height, 2.42 ft); minimum daily, 0.40 cfs Jan. 31, 1966, result of freezeup.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.5 cfs	3.2 cfs	2.9 cfs

Basis of estimate.--Correlated with 1-6195, Antietam Creek near Sharpsburg, Md.

1-6191.5. Marsh Run at Fiddlesburg, Md.

Location.--Lat 39°39'29", long 77°41'16", at bridge on Old Forge Road, at Fiddlesburg, 0.6 mile above mouth and 0.5 mile east of Hagerstown city limits, Washington County.

Drainage area.--31 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	2.7 cfs	1.1 cfs	0.8 cfs

Basis of estimate.--Correlated with 1-6195, Antietam Creek near Sharpsburg, Md., using nine discharge measurements made in the period 1964-67.

1-6194.8. Little Antietam Creek at Keedysville, Md.

Location.--Lat 39°29'10", long 77°42'05", at bridge on Koffman Lane, at Keedysville, Washington County.

Drainage area.--24 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	5.4 cfs	3.6 cfs	3.3 cfs

Basis of estimate.--Correlated with 1-6195, Antietam Creek near Sharpsburg, Md., using 11 discharge measurements made in the periods 1956, 1964-67.

1-6391. Piney Creek at Taneytown, Md.

Location.--Lat 39°39'56", long 77°10'04", 50 ft northwest of culvert under State Highway 194, 0.6 mile northeast of Taneytown, Carroll County.

Drainage area.--22.9 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.2 cfs	0 cfs	0 cfs

Basis of estimate.--Correlated with 1-6395, Big Pipe Creek at Bruceville, Md., using 11 discharge measurements made in the periods 1956-59, 1961-63, and observations of no flow made in 1963 and 1966.

1-6394. Big Pipe Creek at Bachman Mills, Md.

Location.--Lat 39°39'39", long 76°56'54", at bridge on State Highway 496, at Bachman Mills, Carroll County.

Drainage area.--9.39 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.0 cfs	2.3 cfs	1.8 cfs

Basis of estimate.--Correlated with 1-6395, Big Pipe Creek at Bruceville, Md., using 14 discharge measurements made in the periods 1956-59, 1961-63, 1966.

1-6394.5. Big Pipe Creek near Mayberry (at Pipe Creek), Md.

Location.--Lat 39°40'01", long 77°06'23", below Silver Run, 1,000 ft west of Pipe Creek Mill, 1.8 miles north of Mayberry, Carroll County.

Drainage area.--51.6 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	11 cfs	3.9 cfs	2.6 cfs

Basis of estimate.--Correlated with 1-6395, Big Pipe Creek at Bruceville, Md., using 12 discharge measurements made in the periods 1956-59, 1962-63, 1966.

1-6394.7. Meadow Branch near Uniontown, Md.

Location.--Lat 39°36'32", long 77°06'52", at bridge on State Highway 84, 1.1 miles north of Uniontown, Carroll County.

Drainage area.--12.6 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	3.3 cfs	1.6 cfs	1.0 cfs

Basis of estimate.--Correlated with 1-6395, Big Pipe Creek at Bruceville, Md., using 13 discharge measurements made in the periods 1956-59, 1961-63, 1966.

1-6401. Wolfpit Branch at Linwood, Md.

Location.--Lat 39°33'57", long 77°08'44", at bridge on State Highway 75, 0.2 mile northwest of Linwood, Carroll County.

Drainage area.--2.01 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.8 cfs	0.4 cfs	0.3 cfs

Basis of estimate.--Correlated with 1-6395, Big Pipe Creek at Bruceville, Md., made in the periods 1956-59, 1961-63, 1966.

1-6401.5. Little Pipe Creek at Union Bridge, Md.

Location.--Lat 39°34'20", long 77°10'35", at bridge on State Highway 75, 0.1 mile north of Union Bridge, Carroll County.

Drainage area.--40.4 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	12 cfs	5.8 cfs	4.2 cfs

Basis of estimate.--Correlated with 1-6395, Big Pipe Creek at Bruceville, Md., using 11 discharge measurements made in the periods 1956-59, 1962-63, 1966.

1-6420.5. Israel Creek near Walkersville, Md.

Location.--Lat 39°28'27", long 77°20'26", at bridge on Crum Road, 1.1 miles southeast of Walkersville, Frederick County.

Drainage area.--29 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.7 cfs	0.4 cfs	0.1 cfs

Basis of estimate.--Correlated with 1-6395, Big Pipe Creek at Bruceville, Md., using five discharge measurements made in the period 1964-66 and one observation of no flow in 1966.

1-6431. Bush Creek at Ijamsville, Md.

Location.--Lat 39°21'32", long 77°19'27", at bridge on Mussetter Road, at Ijamsville, Frederick County.

Drainage area.--17.5 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	4.3 cfs	2.3 cfs	1.9 cfs

Basis of estimate.--Correlated with 1-6425, Linganore Creek near Frederick, Md., using six discharge measurements made in the period 1964-66.

1-6444. Little Seneca Creek at Boyds, Md.

Location.--Lat 39°10'29", long 77°18'01", at bridge on State Highway 117, 0.9 mile southeast of Boyds, Montgomery County.

Drainage area.--21 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	3.7 cfs	1.1 cfs	-

Basis of estimate.--Correlated with 1-6450, Seneca Creek at Dawsonville, Md., using five discharge measurements made in the period 1964-67.

1-6462.2. Rock Run near Cabin John, Md.

Location.--Lat 38°58'30", long 77°10'58", at bridge on east access road from MacArthur Boulevard to David Taylor Model Basin, 1.1 miles west of Cabin John, Montgomery County.

Drainage area.--4.8 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.5 cfs	0.2 cfs	-

Basis of estimate.--Correlated with 1-6495, Northeast Branch Anacostia River at Riverdale, Md., using five discharge measurements made in the period 1964-67.

1-6536. Piscataway Creek at Piscataway, Md.

Location.--Lat 38°42'20", long 76°58'00", on left bank 70 ft upstream from bridge on State Highway 223, at Piscataway, Prince Georges County, 0.4 mile upstream from Tinker Creek, and 4.8 miles upstream from mouth.

Drainage area.--39.5 sq mi.

Records available.--October 1965 to September 1967.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Extremes.--1965-67: Maximum discharge, 749 cfs Oct. 19, 1966 (gage height, 6.13 ft); no flow during parts of July, August, and September 1966.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.2 cfs	0 cfs	0 cfs

Basis of estimate.--Correlated with 1-6535, Henson Creek at Oxon Hill, Md.

1-6583. Reeder Run at Chicamuxen, Md.

Location.--Lat 38°31'58", long 77°13'39", at bridge on State Highway 224, 0.8 mile west of Chicamuxen, Charles County.

Drainage area.--5.6 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.3 cfs	0 cfs	-

Basis of estimate.--Correlated with 1-6610, Chaptico Creek at Chaptico, Md., using seven discharge measurements made in the period 1964-67 and one observation of no flow in 1966.

1-6613. McIntosh Run at Tintop Hill, Md.

Location.--Lat 38°20'02", long 76°37'57", at bridge on McIntosh Road, 1.0 mile northwest of Tintop Hill, St. Marys County.

Drainage area.--12.1 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.3 cfs	0.1 cfs	0 cfs

Basis of estimate.--Correlated with 1-6615, St. Marys River at Great Mills, Md., using seven discharge measurements made in the period 1964-67 and one observation of no flow in 1966.

3-0754. Laurel Run at Crellin, Md.

Location.--Lat 39°23'04", long 79°28'25", 800 ft above mouth, 0.5 mile southwest of Crellin, Garrett County.

Drainage area.--10.9 sq mi.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.8 cfs	0.4 cfs	0.3 cfs

Basis of estimate.--Correlated with 1-5950, North Branch Potomac River at Steyer, Md., using 12 discharge measurements made in the period 1964-67.

3-0765.8. South Branch Bear Creek near Accident, Md.

Location.--Lat 39°36'39", long 79°20'02", at culvert on U.S. Highway 219, 1.5 miles southwest of Accident, Garrett County.

Drainage area.--6.0 sq mi, approximately.

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	0.3 cfs	0.1 cfs	-

Basis of estimate.--Correlated with 3-0780, Casselman River at Grantsville, Md., using seven discharge measurements made in the period 1964-67.

3-0766. Bear Creek at Friendsville, Md.

Location.--Lat 39°39'22", long 79°23'41", on right bank 0.2 mile downstream from bridge on Accident-Friendsville Road, 0.6 mile downstream from South Branch Bear Creek, 0.8 mile southeast of Friendsville, Garrett County, and 1.2 miles upstream from mouth.

Drainage area.--48.9 sq mi.

Records available.--October 1964 to September 1967.

Gage.--Graphic water-stage recorder. Altitude of gage is 1,555 ft (from topographic map).

Extremes.--1965-67: Maximum discharge, 1,980 cfs Mar. 7, 1967 (gage height, 6.61 ft); minimum, 1.5 cfs Sept. 12, 1966 (gage height, 0.42 ft).

Low-flow frequency.--Estimated average annual minimum discharges for seven consecutive days.

Recurrence interval	2 years	10 years	20 years
Discharge	3.3 cfs	1.7 cfs	-

Basis of estimate.--Correlated with 3-0780, Casselman River at Grantsville, Md.

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