

Prepared in cooperation with the Minnesota Department of Transportation

Methods and Results of Peak-Flow Frequency Analyses for Streamgages in and bordering Minnesota, through Water Year 2011



Scientific Investigations Report 2013–5110

Cover. U.S. Geological Survey streamgage 05132000 Big Fork River at Big Falls, Minnesota, April 10, 2011.
Photograph by Russ Buesing, U.S. Geological Survey.

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By Erich W. Kessler, David L. Lorenz, and Christopher A. Sanocki

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Scientific Investigations Report 2013–5110

**U.S. Department of the Interior
U.S. Geological Survey**

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Area	
square mile (mi ²)	259.0	hectare (ha)
square mile (mi ²)	2.590	square kilometer (km ²)
	Flow rate	
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)

Water year is the 12-month period October 1 through September 30, designated by the calendar year in which the water year ends.

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Altitude, as used in this report, refers to distance above the vertical datum.

Abbreviations

AEP	annual exceedance probability
EMA	expected moments algorithm
NWIS	National Water Information System (U.S. Geological Survey database)
USGS	U.S. Geological Survey
WIE	weighting of independent estimates

Methods and Results of Peak-Flow Frequency Analyses for Streamgages in and bordering Minnesota, through Water Year 2011

By Erich W. Kessler, David L. Lorenz, and Christopher A. Sanocki

Abstract

Peak-flow frequency analyses were completed for 409 streamgages in and bordering Minnesota having at least 10 systematic peak flows through water year 2011. Selected annual exceedance probabilities were determined by fitting a log-Pearson type III probability distribution to the recorded annual peak flows. A detailed explanation of the methods that were used to determine the annual exceedance probabilities, the historical period, acceptable low outliers, and analysis method for each streamgage are presented. The final results of the analyses are presented.

Introduction

Knowledge of the peak-flow values associated with floods is essential for the design of bridges, culverts, and dams along Minnesota's rivers and streams. Statistical probability (chance) commonly is used to put a context to floods and their occurrence (Holmes and Dinicola, 2010). If the probability of a particular flood magnitude being equaled or exceeded is known, then risk can be assessed. Thus, peak-flow frequency analyses are needed for flood-plain management and flood insurance rate studies. These data also are used for regulation and planning of water resources.

The annual exceedance probability (AEP) is the probability that the largest peak flow during a water year (October 1 through September 30) equals or exceeds the associated flow. These probability estimates, in the past, have been reported in terms of a recurrence interval (the reciprocal of the AEP). For example, an AEP of 0.01 is associated with the flow that would be exceeded once in a random sample of 100 water years on average (100-year flood). The terminology associated with flood-frequency estimates has shifted away from recurrence interval, and the AEP is now the preferred terminology by the U.S. Geological Survey (USGS; Holmes and Dinicola, 2010). Throughout this report, the term AEP will be used to describe peak-flow frequency estimates.

For the purpose of estimating peak-flow frequencies, two types of streamgage record are used: continuous and partial. Continuous-record streamflow data are collected with sufficient frequency to define daily mean values and variations within a day. Partial-record data are discrete measurements of one or more hydrologic parameters that are obtained during a period of time. Common examples of partial-record data are peak stage (height of water surface above an established datum) and flow collected at a crest-stage gage, which is a streamgage that is nonmechanical, nontelemetered, and intended to record only the peak (crest) stream level since the last site visit. The longest record for a streamgage in Minnesota is for the Mississippi River at St. Paul, Minnesota. (USGS streamgage 05331000), which has continuous-record streamflow from 1893 through 2011 (U.S. Geological Survey, 2013a). Gaging of additional streams in Minnesota by the USGS to obtain daily streamflow records started about 1909. The number of streamgages decreased between 1912 and 1920. During the late 1920s and early 1930s, the number of streamgages increased and many of those streamgages have been in operation through 2011. During the years, streamgages were added to the USGS streamgage network where streamflow information was needed or were discontinued where additional data were less critical. In Minnesota, most continuous-recording streamgages are located on perennial (continuously flowing) streams with drainage areas greater than 300 square miles (mi²). For example, in 2008 about 82 percent of continuous-recording streamgages in Minnesota had drainage areas greater than 300 mi².

In the 1950s, planners for the Interstate Highway System learned that little peak-flow information was available for streams with drainage areas less than about 60 mi². This information was needed to determine the sizes of bridge and culvert openings to use where highways crossed stream channels. As a result, small-stream flood investigations were initiated nationwide. The program in Minnesota began in 1958, and during the next 6 years about 150 crest-stage gages were established to determine annual peak flow and stage on streams draining about 60 mi² or less (Gunard and Smith, 1982). These crest-stage gages differ from continuous-record streamgages in that

streamflow record generally is not continuous—only peak stages and flows are recorded. Most of these crest-stage gages were operated through the 1970s. In the 1980s, crest-stage gages with drainage areas less than 10 mi² were discontinued. Recently (1997), new crest-stage gages were established throughout the State on streams draining areas from 10 mi² to several hundred square miles.

Lorenz and others (2010) presented peak-flow frequency analyses for 330 streamgages in Minnesota and adjacent areas in Iowa and South Dakota based on data through water year 2005. The USGS, in cooperation with the Minnesota Department of Transportation, completed updated or new analyses of peak-flow frequency for 409 streamgages in and bordering Minnesota using data through water year 2011.

The purpose of this report is to describe the methods used in peak-flow frequency analyses to determine the peak-flow statistics (AEPs) for streamgages in and bordering Minnesota, through water year 2011. Specifically, the report includes a list of the streamgages used in this study, describes the methods used to graph the statistics, and describes the graphs and output files.

Methods Used for Peak-Flow Frequency Analyses

Peak-flow data from 530 streamgages in and bordering Minnesota (fig. 1, table 1–1 in appendix 1) were retrieved from the USGS National Water Information System (NWIS; Mathey, 1998). Peak-flow records for these sites are available from the NWIS internet interface, NWISWeb, at <http://nwis.waterdata.usgs.gov/nwis/peak>. The peak-flow data for the period of record for each streamgage through September 30, 2011, were used in this analysis. Peak-flow frequency analyses were determined for 409 of the 530 streamgages. The remaining 121 stations did not have the minimum 10 systematic recorded peak flows required for statistical analysis.

Peak-Flow Data

Annual peak flow is defined as the greatest instantaneous flow observed during the water year (October 1 through September 30). The annual peak flow must be independent of annual peak flows that occurred during adjacent water years.

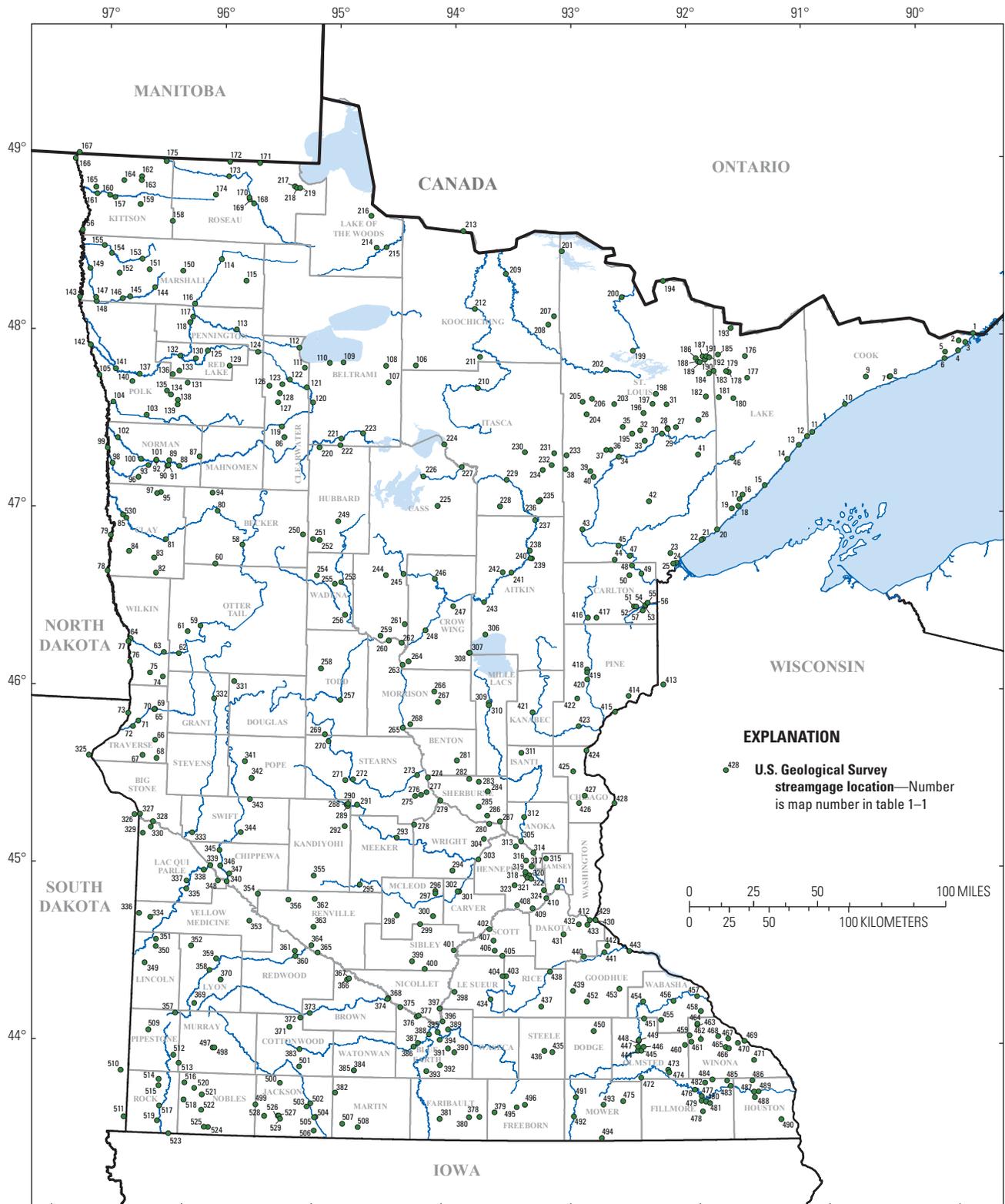
Peak-flow data can be divided into two general categories: systematic and historical. Systematic peak flows are data that are collected whenever the streamgage is operational, even if only in operation for 1 year. These data are assumed to represent a systematic random sample of the population of peak flows. Historical peak flows are data that are collected for the specific purpose of documenting a large flood at a location where or at a time when no streamgage is operating. Historical peak flows represent a nonrandom sample and must be treated separately from systematic peak flows.

Because systematic peak flows are assumed to be a random sample of the population, their analysis is straightforward—the statistics of the population are based on the sample of systematic peak flows. Historical peak flows can yield additional information if they can be put into the context of a historical period. If a historical peak flow was recorded because it was an extraordinary event, then it can be put into the context of the historical period based on recorded human events (newspapers for example). In some cases, historical peak flows at a short-term streamgage can be correlated with record from a long-term streamgage to estimate a historical period. Examples are described in the “Results of Peak-Flow Frequency Analyses” section.

Peak-Flow Statistics

Selected AEP statistics were determined by fitting a log-Pearson Type III probability distribution to the recorded annual peak flows according to the procedures outlined in Bulletin 17B (Interagency Advisory Committee on Water Data, 1982). The latest version of the computer program PEAKFQ (Flynn and others, 2006) was used to compute the frequency estimates for the streamgages. The procedures in Bulletin 17B include the Bulletin 17B Grubbs-Beck test (Grubbs and Beck, 1972; based on the mean, standard deviation, and skew) for detecting unusually high and low peak flows (outliers) at the 10-percent significance level that can affect the analysis. Peak flows flagged as high outliers require user judgment about putting the outlier into a historical period of record. Peak flows flagged as low outliers generally are excluded from the analysis, and the conditional probability adjustment described in appendix 5 of Bulletin 17B (Interagency Advisory Committee on Water Data, 1982) is applied to the analysis. Bulletin 17B recommends the use of a skew coefficient that is based on the skew of the log-series of the period of record (commonly termed the “station skew”), weighted with a generalized, or regional, skew coefficient. The weighting is based on the length of the period of record and the estimated standard error for the method used to determine the generalized skew coefficient. The generalized skew coefficients for Minnesota streamgages used in the peak-flow frequency analysis for this report were based on Lorenz (1997).

An alternate method, the expected moments algorithm (EMA; Cohn and others, 1997), was used to reduce bias that results from the method described in Bulletin 17B. Both methods assume the peak flows have a log-Pearson Type III distribution, which is characterized by the mean, standard deviation, and skewness of the log-transformed peak-flow values; however, the EMA permits efficient use of interval data, which arise in the context of historical flood information (Cohn and others, 1997), low outliers (Griffis and others, 2004), uncertain data points (Cohn and others, 2001), and other selected situations. The EMA also provides a method for computing reasonably accurate confidence intervals (Cohn and others, 2001). Confidence intervals provide indications of



Base from U.S. Census Bureau's Master Address File Topologically Integrated Geographic Encoding and Referencing (MAF/TIGER) database, 2009, Minnesota Department of Natural Resources digital data, 2012, Esri Data and Maps, 2008, various scales Universal Transverse Mercator projection, Zone 15 North American Datum of 1983

Figure 1. Streamgages with peak-flow data in Minnesota, 2011.

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the ability to predict a certain AEP and generally, the longer the period of record or number of peak flows documented, the more reliable the AEP. The program that was used, PeakFqSA (http://www.timcohn.com/TAC_Software/PeakfqSA/, accessed June 2010), retains the structure and moments-based approach of Bulletin 17B and therefore, easily accommodates the other Bulletin 17B procedures (Cohn and others, 1997; Cohn and others, 2001; England, Jarrett, and Salas, 2003; England, Salas, and Jarrett, 2003; Griffis and others, 2003, 2004).

PeakFqSA uses a single Grubbs-Beck test that is the same as the Bulletin 17B Grubbs-Beck test except that PeakFqSA computes an attained probability value for the lowest flow instead of the 10-percent significance level used in Bulletin 17B. PeakFqSA also includes an additional test, the multiple Grubbs-Beck test, for low outliers (Timothy A. Cohn, U.S. Geological Survey, written commun., June 2011), which is intended to reduce the effect of low peak flows on the upper part of the frequency curve. This test is based on a one-sided, 10-percent significance level for a normally distributed sample, but the test is constructed so that groups of ordered data are examined (for example, the eight smallest values) and excluded from the dataset when the critical value is calculated. If the critical value is greater than the eighth smallest value, then all eight values are considered to be low outliers. As described by Timothy A. Cohn (U.S. Geological Survey, written commun., February 2011) in an evaluation study, the low outliers identified by the multiple Grubbs-Beck test closely match user-selected low-outlier thresholds determined from plotted flood-frequency curves. The multiple Grubbs-Beck test was used in this analysis when a visual inspection of plotted flood-frequency curves identified that the upper tail of the fitted curve was unduly affected by several small peak flows that were not detected by the single Grubbs-Beck test, but should probably not be used in the analysis. For cases where the multiple Grubbs-Beck test detected too many low outliers, a fixed low-outlier threshold was supplied by the user to improve the frequency curve fit.

The decisions regarding the use of generalized skew, handling of low and high outliers, and handling of peak flows affected by regulation or urbanization are outlined below, and details are provided for each station in table 1–1 in appendix 1.

- The selection of skew was based on two factors: drainage area and degree of regulation. The station skew was used for streamgages with drainage areas larger than 6,000 mi² or with peak flows affected by regulation or urbanization. For streamgages with drainage areas less than 6,000 mi² and peak flows substantially unaffected by regulation or urbanization, the weighted

skew, including the station skew and the generalized skew (Lorenz, 1997), was used.

- The default procedures of Bulletin 17B were used for analyses of each streamgage unless the following conditions were encountered:
 - If the default procedures in Bulletin 17B detected a low outlier, then the EMA procedure was used to analyze the peak flows. If the single Grubbs-Beck test result fit the data well, then it was accepted (this result is considered the default EMA result in table 1–1 in appendix 1). Otherwise, the multiple Grubbs-Beck test or a fixed low-outlier threshold was used to fit the data (these two results are considered the modified EMA result in table 1–1 in appendix 1).
 - If the default procedures in Bulletin 17B detected a high outlier, then records for nearby, long-term streamgages were reviewed to identify an appropriate historical context for the suspected outlier. If a similar peak flow was present, then the high outlier was placed in that historical period. Otherwise, the results were accepted as is, and it was noted that insufficient evidence existed to place the peak flow in a historical context.
 - Peak flows affected by regulation or urbanization present a special problem for peak-flow analysis. The general assumption required is that the management of the regulation has been consistent over time so that the results of the analysis do reflect the current flood statistics. That assumption was made for all streamgages except when regulation started or stopped during the systematic period, in which case the recent record was used for the analysis.

The AEPs also were calculated using the weighting of independent estimates (WIE) procedure (Interagency Advisory Committee on Water Data, 1982, appendix 8). The independent estimates were based on Lorenz and others (2010). The WIE procedure was applied to appropriate records as described in Lorenz and others (2010): unregulated, unaffected by urbanization, and drainage area less than 3,000 mi². The WIE procedure involves using the at-site estimates as well as those from regional studies. The use of WIE can provide a better estimate of the AEP at a streamgage by computing a weighted average of the at-site estimate with the regional estimate.

Results of Peak-Flow Frequency Analyses

Results of the peak-flow analyses for each of the 409 streamgages for which peak-flow frequency analyses were completed are presented in appendixes 2 and 3. This section describes the information presented in these appendixes.

For each streamgage, a streamgage report file (appendix 2) and a streamgage graph file (appendix 3) are provided in portable document format (PDF). An example of the streamgage report file is shown in tables 1–3. The streamgage report files present the specifications of the analyses, the results of the peak-flow analyses, and the peak-flow data. These report files summarize information from all analytical methods. An example of several different streamgage graph files are depicted in figures 2–4. These figures present the data and the results of the analysis on two probability scales: the normal scale is useful for assessing the curvature of the data, and the Pearson Type III is useful for assessing the goodness of fit.

Explanation and Example of a Streamgage Report File

Each streamgage report file has three or more pages. The first page summarizes the data and presents the options for analysis and the results of the systematic record analysis, which basically includes the raw statistics of the peak-flow data. The second page presents the final analysis, and the remaining page or pages present the peak-flow data. An example of the contents of the first page of the streamgage report file is shown in table 1 with comments and explanations of the report file's contents.

An example of the contents of the second page of the streamgage report file is shown in table 2. This page of the report file explains the results of the final analysis, which contains the moments of the common logarithms of the peak flows and the estimated peak flows at selected probability levels.

An example of the third page and subsequent pages, if any, of the streamgage report file is shown in table 3. This page or pages of the report file provide the peak-flow data for each year of streamgage record and any qualifying codes used in the analysis. Possible peak-flow codes used in analysis are shown in table 4.

Explanation and Examples of Streamgage Graph Files

Each streamgage graph file is composed of one page containing two graphs: one normal and one Pearson type III (appendix 3). Each graph has the peak-flow frequency estimate (with respective confidence limits) and the annual peak flows. If applicable, the graphs also indicate historical peak flows (blue dots), historical thresholds, low-outlier thresholds, and peak flows with “<” and “>” symbols (shown as censored peak flows) with their respective direction. Example graphs are shown for historical peak flows (fig. 2), low-outlier threshold (fig. 3), and censored peak flows (fig. 4).

Summary

Knowledge of the peak-flow values associated with floods is essential for the design of bridges, culverts, and dams along Minnesota's rivers and streams. Peak-flow frequency analyses were completed by the U.S. Geological Survey, in cooperation with the Minnesota Department of Transportation, for 409 streamgages in and bordering Minnesota having at least 10 systematic peak flows through water year 2011. The results of the peak-flow frequency analyses are presented in this report. Selected annual exceedance probabilities were determined by fitting a log-Pearson Type III probability distribution to the recorded annual peak flows according to the procedures outlined in Bulletin 17B. A detailed explanation of the methods that were used to determine the annual exceedance probabilities, the historical period, acceptable low outliers, and analysis method at each streamgage are presented. The final results of the analyses are presented in tables and graphs.

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Table 1. Example of page 1 of a streamgage report file.

ANNUAL PEAK-FLOW FREQUENCY ANALYSIS

For more information on the contents of this documentation, see Kessler and others (2013).¹

Streamgage number and name:

05247500 Crow Wing River near Pillager, Minn.

Peak-flow information:

Number of systematic peak flows in record	42	
Systematic period begins ²	1969	
Systematic period ends	2011	
Length of systematic record	43	
Years without information	³ 1	
Number of historical peak flows in record	41	1965
Length of historical period	⁵ 88	
Historical period begins ⁶	1924	
Historical period ends	2011	
Historical period based on		Comments in streamgage record ⁷

Frequency analysis options:

Method	Expected moments algorithm (EMA) ⁸
Skew option	Station skew ⁹
Low-outlier method	Multiple Grubbs-Beck test ¹⁰

Bulletin 17B systematic record analysis results:

Moments of the common logarithms of the peaks:¹¹

Mean	Standard deviation	Skewness
3.7765	0.2636	-0.250

Outlier criteria and number of peak flows exceeding:¹²

Low	1,173.7	0
High	18,300.0	0

EMA systematic record analysis results:

Moments of the common logarithms of the peaks:¹³

Mean	Standard deviation	Skewness
3.7759	0.2592	-0.312

Low-outlier information:

Number of low outliers	0
Low-outlier threshold	Not determined ¹⁴

¹This is a link to this report.

²The first and last year of the systematic record is given. There can be breaks in the record not shown by these data.

³This is the number of years between the first and last years of systematic record that do not have peak-flow data.

Table 1. Example of page 1 of a streamgage report file.—Continued

⁴If this number is greater than 0, then the years of the historical peaks are listed to the right.

⁵If a historical period analysis is included in the analysis, then this information and the next three lines are included in the report. Otherwise the next subsection follows immediately.

⁶The beginning and end of the historical period are expressed as dates for EMA, but they are not needed for Bulletin 17B and “Not used by Bulletin 17B” is printed.

⁷A brief explanation for the definition of the historical period is given here; more detail is available in table 1–1 in appendix 1.

⁸This will be either “Expected moments algorithm (EMA)” or “Bulletin 17B,” depending on the method used.

⁹The skew option is either “station skew” or “weighted.” In most cases, “weighted” is used to compute the final skewness according to the guidelines in Bulletin 17B. “Station skew” is used in cases when the drainage area is too large for the generalized skewness (Lorenz, 1997) or when peak flows are affected by regulation. The EMA method also computes the final skew according to the guidelines in Bulletin 17B, but uses a different computation for the variance of the station skewness.

¹⁰The low-outlier method is one of the following “multiple Grubbs-Beck test,” “single Grubbs-Beck test,” “fixed,” or “Bulletin 17B Grubbs-Beck test.” The first two are options for the EMA method.

¹¹The mean, standard deviation, and skewness are computed from the systematic record, not the historical record.

¹²The low- and high-outlier criteria are computed from the mean and standard deviation, with scaling controlled by the number of observations. If any peak flow was less than the low-outlier criterion, then EMA was used. If any peak flows exceeded the high-outlier criterion, then an attempt was made to find a historical context for those peak flows.

¹³The mean, standard deviation, and skewness are computed from the historical period for EMA but not for Bulletin 17B. EMA does not distinguish between the systematic record and the historical record as do the methods in Bulletin 17B.

¹⁴EMA does not report a low-outlier threshold if no peak flow is less than the criteria of the test. If any peak flows are less than the criteria of the test, then the threshold is computed as the value of the smallest peak flow not exceeding the criteria.

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Table 2. Example of page 2 of a streamgage report file.

Final analysis results:

Moments of the common logarithms of the peak flows:¹

	Mean	Standard deviation	Skewness
	3.7759	0.2592	-0.312

Annual frequency curve at selected exceedance probabilities:²

Exceedance probability	Peak estimate	Lower 95 ³ level	Upper 95 level
0.9950	1,080	253	1,690
0.9900	1,300	375	1,930
0.9500	2,130	1,080	2,820
0.9000	2,730	1,760	3,480
0.8000	3,650	2,730	4,530
0.6667	4,740	3,760	5,830
0.5000	6,160	5,010	7,570
0.4292	6,840	5,600	8,400
0.2000	9,930	8,200	11,900
0.1000	12,500	10,300	15,100
0.0400	15,900	13,000	20,500
0.0200	18,400	14,800	25,500
0.0100	20,800	16,300	31,100
0.0050	23,300	17,400	37,300
0.0020	26,600	18,500	46,600

¹The mean, standard deviation, and skewness are computed from the historical period, if any, and incorporate the generalized skew, if appropriate.

²If the weighting of independent estimate (WIE) procedure was used, then three additional columns are displayed in this table: WIE estimate, lower-95 WIE level, and upper-95 WIE level. The WIE estimates are made only for the 0.500, 0.200, 0.100, 0.040, 0.020, 0.010, and 0.002 exceedance probabilities.

³The lower-95 level is the lower 95-percent confidence limit for the estimated peak flow. The upper-95 level is the upper 95-percent confidence limit for the estimated peak flow.

Table 3. Example of page 3 and subsequent pages of a streamgage report file.

Peak-flow data available in the analysis:

Explanation of symbols and codes¹

H Historical, outside of systematic record

K Peak flow affected by regulation

1924 to 1968 lower perception threshold²: 18,300

Water year	Peak flow	Peak code	Water year	Peak flow	Peak-flow code
1965	18,300	KH	1989	6,370	K
	(³)		1990	4,270	K
1969	16,600	K	1991	3,380	K
1970	6,380	K	1992	2,880	K
1971	7,500	K	1993	7,360	K
1972	11,700	K	1994	6,260	K
1973	6,140	K	1995	6,600	K
1974	12,200	K	1996	13,900	K
1975	10,800	K	1997	16,100	K
1976	4,470	K	1998	4,240	K
1977	1,520	K	1999	10,800	K
1978	4,220	K	2000	3,940	K
1979	7,970	K	2001	17,500	K
1980	2,390	K	2002	5,310	K
1981	1,420	K	2003	7,340	K
1982	5,450	K	2004	3,150	K
1983	4,310	K	2005	6,460	K
1984	3,940	K	2006	7,320	K
1985	5,650	K	2007	5,820	K
1986	10,800	K	2008	4,550	K
	Gap in systematic record ⁴		2009	13,400	K
1988	2980	K	2010	11,100	K
			2011	7,560	K

¹See table 4 for listing of all the symbols and codes.

²Perception threshold is based on an investigation of a historical period to determine whether the known historical peak flow had been exceeded in any other year.

³Blank spacing indicates separation between historical and systematic periods.

⁴Indicates a gap in the systematic record, as a result of a discontinued streamgage or missing peak flow.

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Table 4. Peak-flow codes used in analysis.

[NWIS, U.S. Geological Survey National Water Information System]

Peak-flow code	Definition	NWIS code	Peak-flow file explanation
H	Historical, outside of systematic record	7	Discharge is a historical peak flow.
K	Peak flow affected by regulation	6	Discharge affected by regulation or diversion.
U	Peak flow affected by urbanization	C	All or part of the record affected by urbanization, mining, agricultural changes, channelization, or other.
*	Peak flow less than low-outlier perception threshold	None	None.
<	Peak flow less than minimum recordable discharge	4	Discharge less than indicated value, which was minimum recordable discharge at this site.
>	Peak flow greater than maximum recordable discharge	8	Discharge actually greater than indicated value.
D	Dam failure, non-recurrent flow anomaly	3	Discharge affected by dam failure.

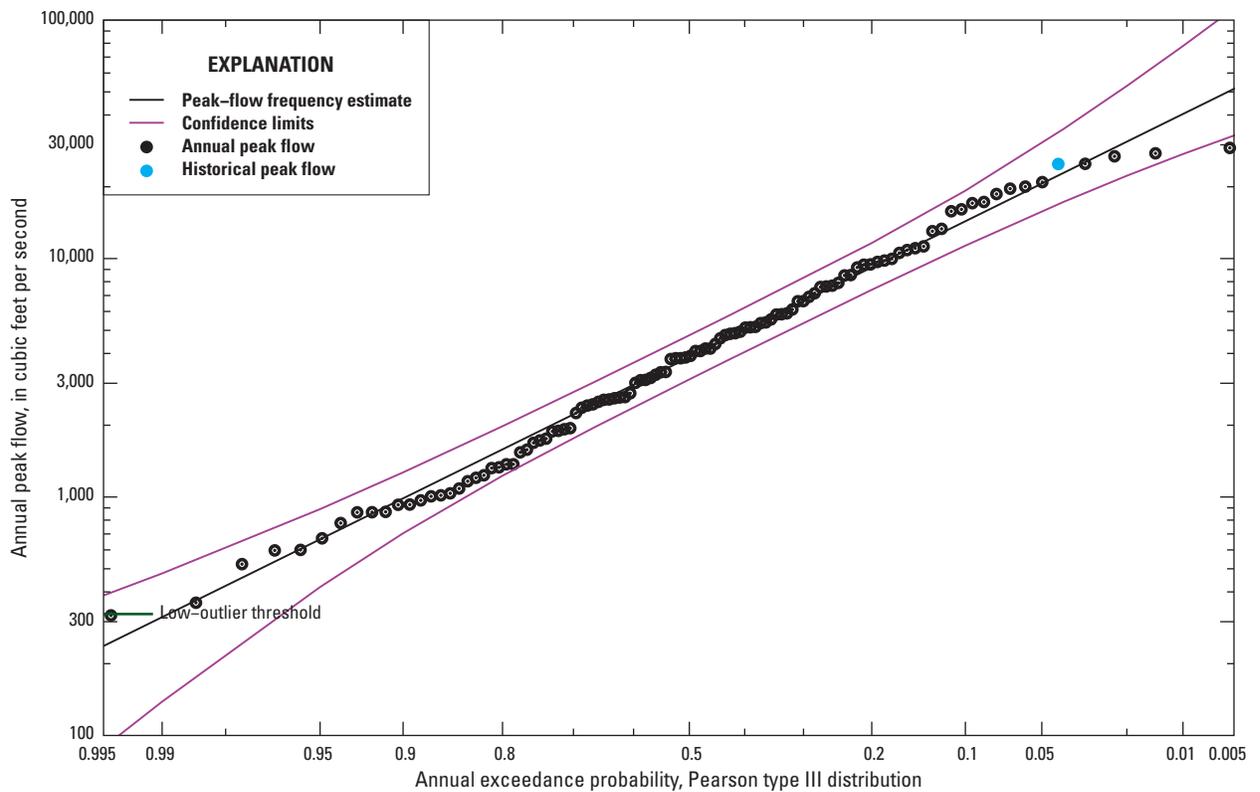
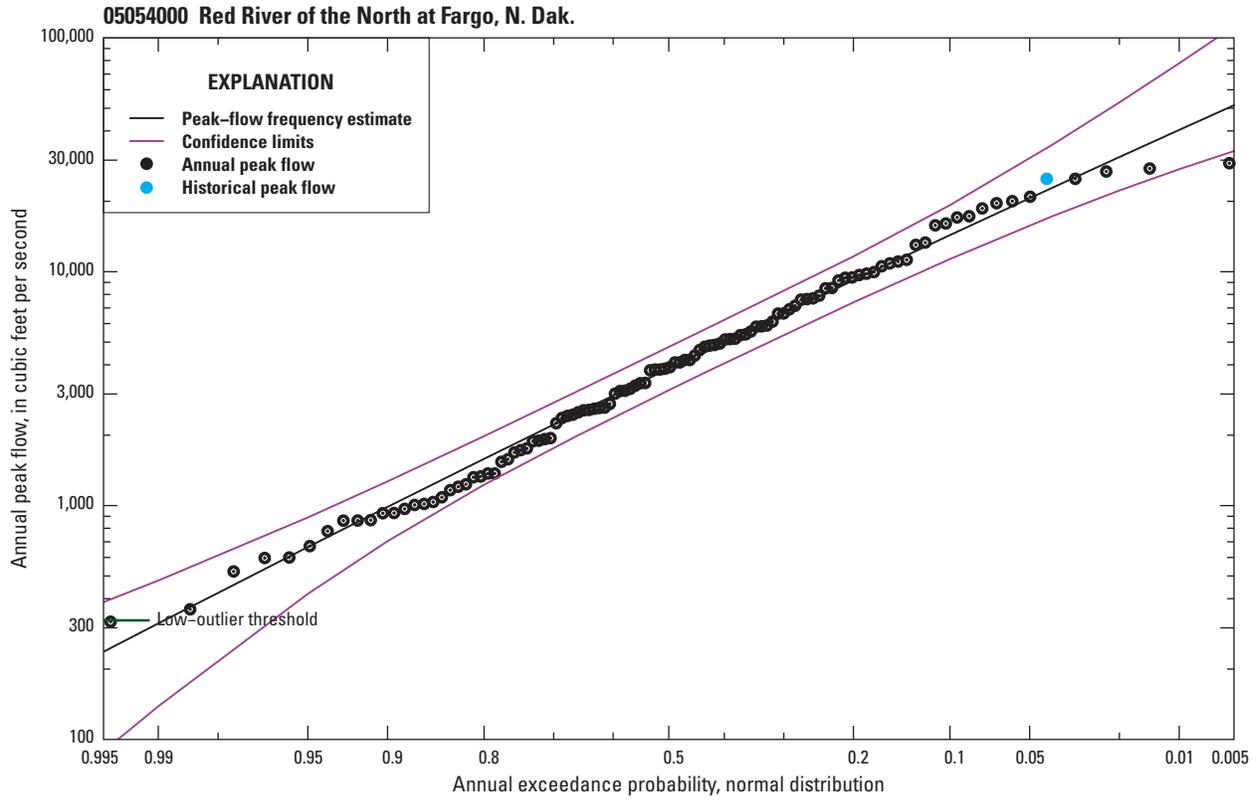


Figure 2. Example of a streamgage graph file with historical peak flows.

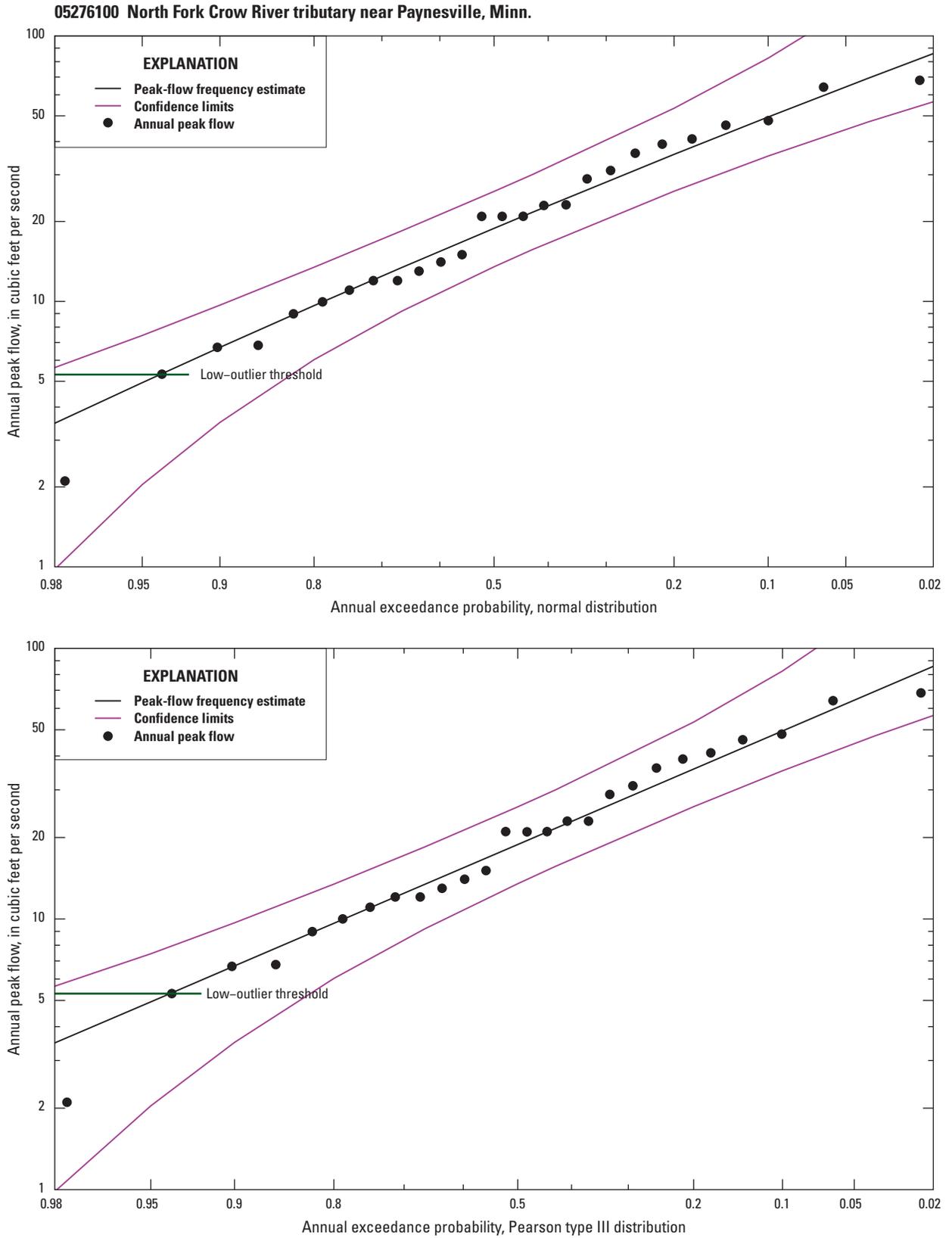


Figure 3. Example of a streamgage graph file with low-outlier threshold.

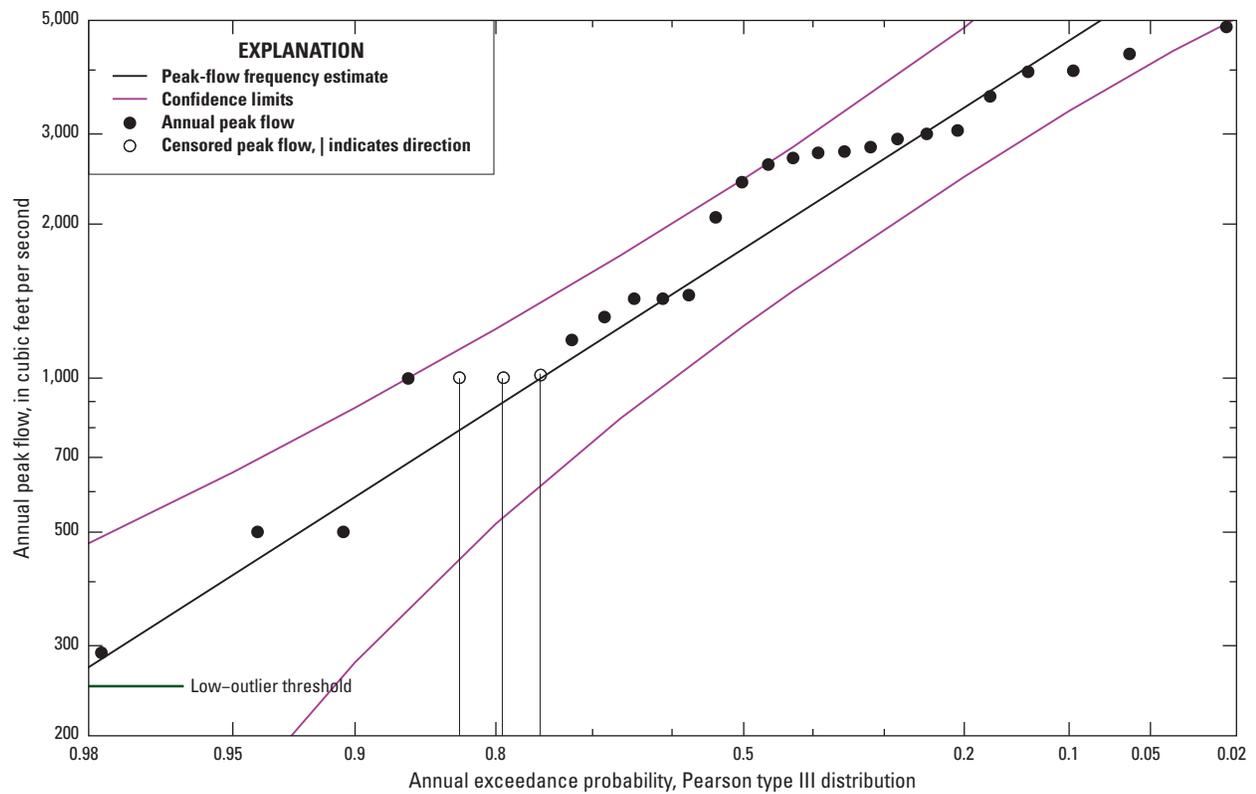
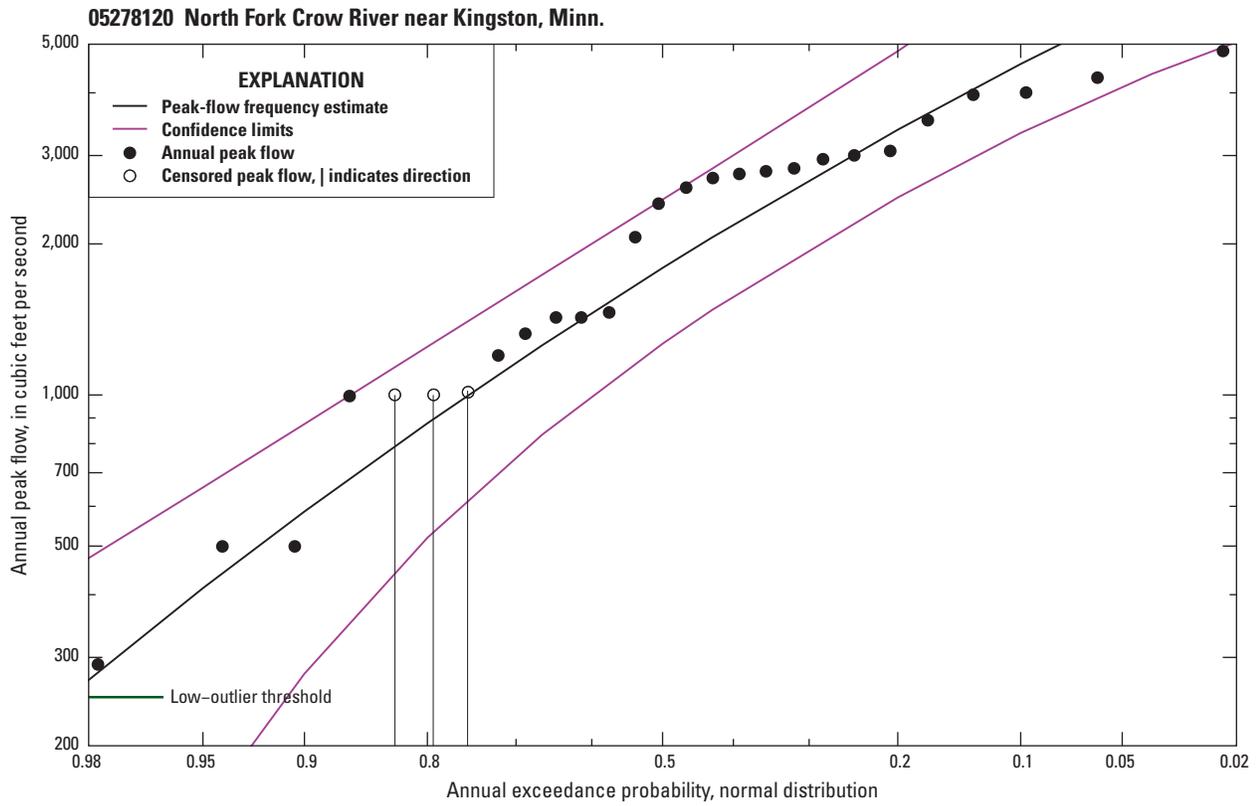


Figure 4. Example of a streamgage graph file with censored peak flows.

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Appendixes

Appendix 1. Streamgages in and bordering Minnesota

A total of 530 streamgages in and bordering Minnesota have peak-flow data through water year 2011 (table 1–1). Of these 530 streamgages, 409 had sufficient peak-flow data to compute peak-flow frequency analyses. The remaining 121 streamgages did not have the minimum 10 systematic recorded peak flows required for statistical analysis.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982); EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
1	04010500	Pigeon River at Middle Falls near Grand Portage, Minn.	05/19/1924	05/01/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, large drainage basin.
2	04010505	Maud Creek near Grand Portage, Minn.	10/23/2004	10/23/2004	Insufficient peak flows	No, insufficient peak flows.
3	04010510	Grand Portage River at Grand Portage, Minn.	06/29/1991	11/18/1991	Insufficient peak flows	No, insufficient peak flows.
4	04010520	Hollow Rock Creek near Red Rock, Minn.	05/30/2003	10/23/2004	Insufficient peak flows	No, insufficient peak flows.
5	04010528	Reservation River near Grand Portage, Minn.	05/30/2003	05/31/2004	Insufficient peak flows	No, insufficient peak flows.
6	04010530	Reservation River near Hovland, Minn.	06/29/1991	07/21/2011	Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
7	04011370	Little Devil Track River near Grand Marais, Minn.	04/20/1961	04/24/1982	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
8	04011390	Little Devil Track River tributary near Grand Marais, Minn.	05/05/1966	10/23/1980	Accepted default results from Bulletin 17B	Yes.
9	04011990	Cascade River at Forest Road 45 near Grand Marais, Minn.	05/31/1985	05/01/2011	Accepted default results from Bulletin 17B	Yes.
10	04012500	Poplar River at Lutsen, Minn.	04/25/1913	05/22/1987	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
11	04013100	Lake Superior tributary near Taconite Harbor, Minn.	05/23/1964	04/13/1981	Accepted default results from Bulletin 17B	Yes.
12	04013200	Caribou River near Little Marais, Minn.	04/20/1961	05/31/1985	Peak flow(s) exceeded high-outlier criterion. Matched historical period of Baptism River (streamgage 04014500), which had large peak in 1977 and no other larger peak flows. Accepted modified results from Bulletin 17B	Yes.
13	04013400	Little Marais River near Little Marais, Minn.	11/07/2000	10/18/2007	Insufficient peak flows	No, insufficient peak flows.
14	04014500	Baptism River near Beaver Bay, Minn.	05/08/1930	07/04/1993	Accepted default results from Bulletin 17B	Yes.
15	04015070	Lake Superior tributary at Split Rock State Park, Minn.	11/07/2000	10/19/2007	Insufficient peak flows	No, insufficient peak flows.
16	04015150	Crow Creek near Silver Creek, Minn.	04/13/1960	04/23/1975	Accepted default results from Bulletin 17B	Yes.
17	04015200	Encampment River tributary at Silver Creek, Minn.	04/13/1960	04/28/1990	Accepted default results from Bulletin 17B	Yes.
18	04015250	Silver Creek tributary near Two Harbors, Minn.	09/30/1965	10/26/2010	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
19	04015300	Little Stewart River near Two Harbors, Minn.	04/13/1960	03/25/2000	Accepted default results from Bulletin 17B	Yes.
20	04015330	Knife River near Two Harbors, Minn.	04/23/1975	06/22/2011	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
21	04015360	Lake Superior tributary number 2 at French River, Minn.	09/07/1964	04/23/1981	Accepted default results from Bulletin 17B	Yes.
22	04015370	Talmadge River at Duluth, Minn.	09/07/1964	05/08/2000	Accepted default results from Bulletin 17B	Yes.
23	04015400	Miller Creek at Duluth, Minn.	05/20/1960	09/03/1985	Affected by urbanization, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
24	04015410	Miller Creek near mouth at Duluth, Minn.	06/24/1993	06/24/1993	Insufficient peak flows	No, insufficient peak flows.
25	04015415	Lake Superior tributary at West 9th Street in Duluth, Minn.	04/23/2001	06/22/2011	Affected by urbanization, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from Bulletin 17B (EMA confidence limits were erroneous)	No, station skew.
26	04015455	South Branch Partridge River near Babbitt, Minn.	09/24/1977	04/19/1980	Insufficient peak flows	No, insufficient peak flows.
27	04015475	Partridge River above Colby Lake at Hoyt Lakes, Minn.	04/22/1979	08/25/1988	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
28	04015500	Second Creek near Aurora, Minn.	04/12/1955	09/20/1980	Accepted default results from Bulletin 17B	Yes.
29	04016000	Partridge River near Aurora, Minn.	06/17/1943	04/27/1982	Accepted default results from Bulletin 17B	Yes.
30	04016500	St. Louis River near Aurora, Minn.	06/16/1943	07/05/1999	Accepted default results from Bulletin 17B	Yes.
31	04017000	Embarrass River at Embarrass, Minn.	06/17/1943	06/26/1964	Accepted default results from Bulletin 17B	Yes.
32	04017700	McKinley Lake tributary at McKinley, Minn.	04/13/1960	06/28/1981	Accepted default results from Bulletin 17B	Yes.
33	04018000	Embarrass River near McKinley, Minn.	04/20/1954	05/25/1962	Insufficient peak flows	No, insufficient peak flows.
34	04018750	St. Louis River at Forbes, Minn.	06/01/1964	04/25/1989	Accepted default results from Bulletin 17B	Yes.
35	04018800	East Two River tributary at Virginia, Minn.	06/11/1959	04/16/1972	Accepted default results from Bulletin 17B	Yes.
36	04018900	East Two River near Iron Junction, Minn.	04/01/1967	04/19/1979	Accepted default results from Bulletin 17B	Yes.
37	04019000	West Two River near Iron Junction, Minn.	04/17/1954	04/21/1979	Accepted default results from Bulletin 17B	Yes.
38	04019300	West Swan River near Silica, Minn.	06/24/1964	04/20/1979	Accepted default results from Bulletin 17B	Yes.
39	04019500	East Swan River near Toivola, Minn.	04/13/1954	04/13/1971	Accepted default results from Bulletin 17B	Yes.
40	04020000	Swan River near Toivola, Minn.	07/04/1953	04/21/1961	Insufficient peak flows	No, insufficient peak flows.
41	04020480	North Branch Whiteface River near Fairbanks, Minn.	04/23/1979	04/10/2011	Accepted default results from Bulletin 17B	Yes.
42	04020700	Bug Creek at Shaw, Minn.	04/23/1979	04/10/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
43	04021205	Floodwood River above Floodwood, Minn.	04/19/1972	07/20/1987	Accepted default results from Bulletin 17B	Yes.
44	04021520	Stoney Brook at Pine Drive near Brookston, Minn.	05/28/2005	10/28/2010	Insufficient peak flows	No, insufficient peak flows.
45	04021530	Stoney Brook at Brookston, Minn.	06/10/1984	06/10/1984	Insufficient peak flows	No, insufficient peak flows.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
46	04021690	Cloquet River near Toimi, Minn.	04/28/1986	04/30/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted modified results from EMA	Yes.
47	04023150	Simian Creek near Brookston, Minn.	06/11/1984	06/11/1984	Insufficient peak flows	No, insufficient peak flows.
48	04023600	Squaw Creek near Cloquet, Minn.	06/11/1984	06/11/1984	Insufficient peak flows	No, insufficient peak flows.
49	04024000	St. Louis River at Scanlon, Minn.	06/12/1908	04/10/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, large drainage basin.
50	04024015	Otter Creek near Cloquet, Minn.	06/10/1984	06/10/1984	Insufficient peak flows	No, insufficient peak flows.
51	04024090	Elim Creek near Holyoke, Minn.	06/17/1976	08/23/1978	Insufficient peak flows	No, insufficient peak flows.
52	04024093	Skunk Creek below Elim Creek near Holyoke, Minn.	06/18/1976	06/15/1978	Insufficient peak flows	No, insufficient peak flows.
53	04024095	Nemadji River near Holyoke, Minn.	09/20/1972	08/03/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
54	04024098	Deer Creek near Holyoke, Minn.	09/24/1977	04/22/2001	Accepted default results from Bulletin 17B	Yes.
55	04024100	Rock Creek near Blackhoof, Minn.	04/20/1961	06/01/1987	Low outlier(s) flagged by Bulletin 17B method. Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
56	04024110	Rock Creek tributary near Blackhoof, Minn.	04/20/1961	04/27/1986	Accepted default results from Bulletin 17B	No, small drainage basin.
57	04024200	South Fork Nemadji River near Holyoke, Minn.	05/14/1961	09/03/1985	Accepted default results from Bulletin 17B	Yes.
58	05030000	Otter Tail River near Detroit Lakes, Minn.	06/20/1937	04/10/1971	Accepted default results from Bulletin 17B	Yes.
59	05030500	Otter Tail River near Elizabeth, Minn.	06/23/1904	06/01/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
60	05040000	Pelican River near Detroit Lakes, Minn.	06/26/1943	06/20/1953	Accepted default results from Bulletin 17B	Yes.
61	05040500	Pelican River near Fergus Falls, Minn.	10/11/1909	04/05/1980	Accepted default results from Bulletin 17B	Yes.
62	05046000	Otter Tail River below Orwell Dam near Fergus Falls, Minn.	05/18/1931	05/02/2011	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
63	05046250	Otter Tail River near Foxhome, Minn.	06/14/1990	06/05/1999	Accepted default results from Bulletin 17B	No, large drainage basin.
64	05046475	Otter Tail River diversion at Breckenridge, Minn.	06/14/2005	04/07/2011	Insufficient peak flows	No, insufficient peak flows.
65	05047500	Mustinka River above Twelvemile Creek near Charlesville, Minn.	06/05/1944	07/13/1955	Peak flow(s) exceeded high-outlier criterion. The Mustinka River above Wheaton (streamgage 05049000) had 3 peak flows in 62 years of record that equaled or exceeded the 1952 peak flow. Unable to extend historical period. Accepted default results from Bulletin 17B	Yes.
66	05047900	Twelvemile Creek at County Road 6, near Dumont, Minn.	05/18/1996	04/04/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
67	05047960	West Branch Twelvemile Creek near Graceville, Minn.	04/13/1964	5/21/1972	Insufficient peak flows	No, insufficient peak flows.
68	05047970	West Branch Twelvemile Creek tributary near Graceville, Minn.	04/13/1964	03/26/1989	Accepted default results from Bulletin 17B	Yes.
69	05048000	Mustinka River below Twelvemile Creek near Charlesville, Minn.	06/04/1944	07/13/1955	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
70	05048500	Mustinka River, old channel, at Twelvemile Creek mouth, Minn.	06/04/1944	04/01/1955	Peak flow(s) exceeded high-outlier criterion. The Mustinka River above Wheaton (streamgage 05049000) had 3 peak flows in 62 years of record that equaled or exceeded the 1952 peak flow. Unable to extend historical period. Accepted default results from Bulletin 17B	No, regression not available for old channel.
71	05049000	Mustinka River above Wheaton, Minn.	**/**/1916	04/06/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
72	05049200	Eighteen Mile Creek near Wheaton, Minn.	06/01/1965	05/18/1996	Accepted default results from Bulletin 17B	Yes.
73	05050000	Bois de Sioux River near White Rock, S. Dak.	07/11/1942	04/15/2011	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
74	05050700	Rabbit River near Nashua, Minn.	04/12/1979	03/31/2006	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
75	05051000	Rabbit River at Campbell, Minn.	04/03/1943	04/01/1952	Peak flow(s) exceeded high-outlier criterion. The Mustinka River above Wheaton (streamgage 05049000) had 3 peak flows in 62 years of record that equaled or exceeded the 1952 peak flow. Unable to extend historical period. Accepted default results from Bulletin 17B	Yes.
76	05051300	Bois de Sioux River near Doran, Minn.	03/16/1990	04/07/2011	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
77	05051500	Red River of the North at Wahpeton, N. Dak.	06/07/1942	04/07/2011	Historical peak flow(s) detected. Extended historical period back to 1897 to include 1897 peak. Accepted default results from EMA	No, station skew.
78	05051522	Red River of the North at Hickson, N. Dak.	03/31/1976	04/07/2011	Affected by regulation, used station skew. Accepted modified results from EMA	No, station skew.
79	05054000	Red River of the North at Fargo, N. Dak.	04/07/1897	04/09/2011	Historical peak flow(s) detected. Extended historical period back to 1897 to include 1897 peak. Accepted default results from EMA	No, station skew.
80	05060800	Buffalo River near Callaway, Minn.	04/13/1960	04/03/2011	Accepted default results from Bulletin 17B	Yes.
81	05061000	Buffalo River near Hawley, Minn.	03/16/1945	04/12/2011	Historical peak flow(s) detected. Extended historical period back to 1921 to include 1921 peak. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
82	05061200	Whiskey Creek at Barnesville, Minn.	03/13/1961	04/02/2011	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
83	05061400	Spring Creek above Downer, Minn.	03/03/1961	06/20/2000	Accepted default results from Bulletin 17B	Yes.
84	05061500	South Branch Buffalo River at Sabin, Minn.	03/18/1945	04/04/2011	Accepted default results from Bulletin 17B	Yes.
85	05062000	Buffalo River near Dilworth, Minn.	04/10/1931	04/06/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
86	05062280	Mosquito Creek near Bagley, Minn.	04/18/1961	03/24/1985	Accepted default results from Bulletin 17B	Yes.
87	05062470	Marsh Creek tributary near Mahnomen, Minn.	03/17/1961	05/12/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
88	05062500	Wild Rice River at Twin Valley, Minn.	07/22/1909	04/11/2011	Accepted default results from Bulletin 17B	Yes.
89	05062700	Wild Rice River tributary near Twin Valley, Minn.	05/14/1961	05/12/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
90	05062800	Coon Creek near Twin Valley, Minn.	06/08/1962	06/09/1984	Accepted default results from Bulletin 17B	Yes.
91	05062850	Coon Creek tributary near Twin Valley, Minn.	06/20/2000	04/08/2001	Insufficient peak flows	No, insufficient peak flows.
92	05062900	Wild Rice River above Ada, Minn.	05/14/1985	04/01/1990	Insufficient peak flows	No, insufficient peak flows.
93	05063000	Wild Rice River near Ada, Minn.	04/09/1948	07/04/1953	Insufficient peak flows	No, insufficient peak flows.
94	05063200	Spring Creek tributary near Ogema, Minn.	06/02/1963	04/03/1989	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
95	05063398	South Branch Wild Rice River at County Road 27 near Felton, Minn.	10/30/2004	04/11/2011	Insufficient peak flows	No, insufficient peak flows.
96	05063500	South Branch Wild Rice River near Borup, Minn.	07/12/1944	06/11/1984	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
97	05063850	State Ditch 45 tributary near Ulen, Minn.	06/09/2002	04/04/2011	Low outlier(s) flagged by Bulletin 17B method. Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
98	05064000	Wild Rice River at Hendrum, Minn.	07/15/1944	04/07/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
99	05064500	Red River of the North at Halstad, Minn.	04/15/1936	04/12/2011	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
100	05067000	Marsh River below Ada, Minn.	04/16/1948	03/05/1973	Insufficient peak flows	No, insufficient peak flows.
101	05067050	Marsh River Ditch near Ada, Minn.	05/13/1985	04/10/2011	River/stream is part of unnatural diversion channel. No analysis	No analysis.
102	05067500	Marsh River near Shelly, Minn.	07/11/1944	04/09/2011	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
103	05068000	Sand Hill River at Beltrami, Minn.	04/05/1943	07/05/1958	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
104	05069000	Sand Hill River at Climax, Minn.	04/07/1943	04/10/2011	Accepted default results from Bulletin 17B	Yes.
105	05070000	Red River of the North near Thompson, N. Dak.	03/31/1999	04/13/2011	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
106	05073600	South Branch Battle River at Northome, Minn.	05/29/1960	08/17/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, small drainage basin.
107	05073750	Spring Creek near Blackduck, Minn.	04/13/1960	04/23/1985	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
108	05073800	Perry Creek near Shooks, Minn.	07/16/1960	06/26/1985	Accepted default results from Bulletin 17B	No, small drainage basin.
109	05073870	Mud River at Redby, Minn.	04/29/1986	04/29/1986	Insufficient peak flows	No, insufficient peak flows.
110	05073900	Pike Creek at Lower Red Lake, Minn.	04/30/1986	04/30/1986	Insufficient peak flows	No, insufficient peak flows.
111	05073980	Sandy River near Red Lake, Minn.	04/02/1986	04/02/1986	Insufficient peak flows	No, insufficient peak flows.
112	05074500	Red Lake River near Red Lake, Minn.	07/04/1933	09/29/2011	Affected by regulation, used station skew. Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	No, station skew.
113	05075000	Red Lake River at High Landing near Goodridge, Minn.	04/05/1930	06/08/2011	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	No, station skew.
114	05075500	Thief River near Gatzke, Minn.	06/07/1954	07/05/1956	Insufficient peak flows	No, insufficient peak flows.
115	05075700	Mud River near Grygla, Minn.	04/26/1979	04/11/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
116	05076000	Thief River near Thief River Falls, Minn.	07/19/1909	04/06/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
117	05076500	Red Lake River at Thief River Falls, Minn.	03/24/1910	05/13/1930	Accepted default results from Bulletin 17B	No, large drainage basin.
118	05076600	Red Lake River tributary near Thief River Falls, Minn.	06/08/1962	09/07/1981	Accepted default results from Bulletin 17B	No, small drainage basin
119	05076690	Clearwater River tributary near Bagley, Minn.	04/07/2001	04/01/2007	Insufficient peak flows	No, insufficient peak flows.
120	05077000	Clearwater River near Pinewood, Minn.	04/13/1940	04/17/1972	Insufficient peak flows	No, insufficient peak flows.
121	05077500	Clearwater River near Leonard, Minn.	05/15/1935	04/21/1947	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
122	05077600	Clearwater River near Clearbrook, Minn.	04/02/1986	04/02/1986	Insufficient peak flows	No, insufficient peak flows.
123	05077700	Ruffy Brook near Gonvick, Minn.	04/20/1961	04/11/2011	Low outlier(s) flagged by Bulletin 17B method. Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
124	05077850	Clearwater River near Trail, Minn.	03/30/1986	03/30/1986	Insufficient peak flows	No, insufficient peak flows.
125	05078000	Clearwater River at Plummer, Minn.	04/27/1939	06/29/2011	Accepted default results from Bulletin 17B	Yes.
126	05078100	Lost River at Gonvick, Minn.	04/26/1960	04/13/1972	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
127	05078180	Silver Creek near Clearbrook, Minn.	04/06/1960	05/11/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
128	05078200	Silver Creek tributary at Clearbrook, Minn.	04/06/1960	06/27/1981	Accepted default results from Bulletin 17B	Yes.
129	05078230	Lost River at Oklee, Minn.	04/23/1961	06/28/2011	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
130	05078400	Clearwater River tributary near Plummer, Minn.	03/24/1961	03/13/1990	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
131	05078470	Judicial Ditch 64 near Mentor, Minn. (SW4)	06/10/2003	03/13/2007	Insufficient peak flows	No, insufficient peak flows.
132	05078500	Clearwater River at Red Lake Falls, Minn.	03/22/1910	06/29/2011	Historical peak flow(s) detected. Extended historical period back to 1910 and forward to 1935 to include 1919 peak flow. Accepted modified results from EMA	Yes.
133	05078520	Cyr Creek near Marcoux Corners, Minn. (SW5)	06/23/2003	10/30/2004	Insufficient peak flows	No, insufficient peak flows.
134	05078720	County Ditch 140 above Burnham-6 impoundment near Tilden, Minn. (SW8)	10/30/2004	05/26/2009	Insufficient peak flows	No, insufficient peak flows.
135	05078730	County Ditch 140 near Benoit, Minn. (SW1)	06/25/2003	03/15/2007	Insufficient peak flows	No, insufficient peak flows.
136	05078770	Judicial Ditch 66 near Marcoux Corners, Minn. (SW6)	06/22/2003	03/26/2009	Insufficient peak flows	No, insufficient peak flows.
137	05079000	Red Lake River at Crookston, Minn.	04/11/1897	04/12/2011	Historical peak flow(s) detected. Extended historical period back to 1897 to include 1897 peak flow. Accepted modified results from EMA	No, large drainage basin.
138	05079200	County Ditch 72 (Burnham Creek) near Maple Bay, Minn. (SW3)	06/25/2003	06/15/2007	Insufficient peak flows	No, insufficient peak flows.
139	05079250	County Ditch 65 near Maple Bay, Minn. (SW2)	06/25/2003	03/13/2007	Insufficient peak flows	No, insufficient peak flows.
140	05079901	Burnham Creek near Crookston, Minn.	03/29/1986	04/12/2011	Accepted default results from Bulletin 17B	Yes.
141	05080000	Red Lake River at Fisher, Minn.	06/24/2000	04/13/2011	River/stream similar to streamgage 05079000. No analysis	No, large drainage basin.
142	05082500	Red River of the North at Grand Forks, N. Dak.	04/18/1882	04/14/2011	Affected by regulation, used station skew. Accepted modified results from EMA. Peak flows prior to 1941 have no affect due to regulation	No, station skew.
143	05083500	Red River of the North at Oslo, Minn.	04/18/1936	04/14/2011	Affected by regulation, used station skew. Accepted modified results from EMA	No, station skew.
144	05085420	Snake River above Radium, Minn.	06/12/2005	06/06/2008	Insufficient peak flows	No, insufficient peak flows.
145	05085450	Snake River above Warren, Minn.	03/24/2009	04/11/2011	Insufficient peak flows	No, insufficient peak flows.
146	05085500	Snake River at Warren, Minn.	03/28/1945	04/21/1956	Insufficient peak flows	No, insufficient peak flows.
147	05085900	Snake River above Alvarado, Minn.	09/03/1993	04/21/1996	Insufficient peak flows	No, insufficient peak flows.
148	05086000	Snake River at Alvarado, Minn.	03/30/1945	04/25/1956	Insufficient peak flows	No, insufficient peak flows.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
149	05086500	Snake River above Middle River near Big Woods, Minn.	03/31/1945	03/31/1945	Insufficient peak flows	No, insufficient peak flows.
150	05086900	Middle River near Newfolden, Minn.	04/25/1979	04/03/2011	Accepted default results from Bulletin 17B	Yes.
151	05087000	Middle River near Strandquist, Minn.	04/11/1954	07/09/1956	Insufficient peak flows	No, insufficient peak flows.
152	05087500	Middle River at Argyle, Minn.	03/30/1945	04/05/2011	Historical peak flow(s) detected. Extended historical period back to 1945 to include 1945 peak flow. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	Yes.
153	05090500	Tamarac River near Strandquist, Minn.	06/17/1954	07/09/1956	Insufficient peak flows	No, insufficient peak flows.
154	05091000	Tamarac River at Stephen, Minn.	03/29/1945	03/29/1945	Insufficient peak flows	No, insufficient peak flows.
155	05091500	Tamarac River near Stephen, Minn.	03/29/1945	04/09/1955	Insufficient peak flows	No, insufficient peak flows.
156	05092000	Red River of the North at Drayton, N. Dak.	04/19/1936	04/19/2011	Affected by regulation, used station skew. Accepted modified results from EMA	No, station skew.
157	05092500	Middle Branch Two Rivers near Hallock, Minn.	04/19/1932	04/29/1938	Insufficient peak flows	No, insufficient peak flows.
158	05093000	South Branch Two Rivers at Pelan, Minn.	03/21/1929	07/10/1956	Accepted default results from Bulletin 17B	Yes.
159	05094000	South Branch Two Rivers at Lake Bronson, Minn.	03/20/1929	04/11/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
160	05095000	Two Rivers at Hallock, Minn.	04/08/1912	04/08/1943	Insufficient peak flows	No, insufficient peak flows.
161	05095500	Two Rivers below Hallock, Minn.	03/28/1945	06/13/1955	Accepted default results from Bulletin 17B	Yes.
162	05096000	North Branch Two Rivers near Lancaster, Minn.	05/12/1930	04/22/1955	Accepted default results from Bulletin 17B	Yes.
163	05096500	State Ditch Number 85 near Lancaster, Minn.	04/08/1929	04/24/1955	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
164	05097000	North Branch Two Rivers at Lancaster, Minn.	09/26/1941	04/21/1956	Insufficient peak flows	No, insufficient peak flows.
165	05097500	North Branch Two Rivers near Northcote, Minn.	04/08/1941	04/18/1951	Insufficient peak flows	No, insufficient peak flows.
166	05102490	Red River of the North at Pembina, N. Dak.	03/27/1985	04/23/2011	Drainage area too large to use regional skew, used station skew. Accepted modified results from Bulletin 17B	No, large drainage basin.
167	05102500	Red River of the North at Emerson, Manitoba, Canada	04/11/1913	04/21/2011	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
168	05103000	Roseau River near Malung, Minn.	04/06/1929	03/25/1946	Accepted default results from Bulletin 17B	Yes.
169	05104000	South Fork Roseau River near Malung, Minn.	04/07/1912	03/24/1946	Accepted default results from Bulletin 17B	Yes.
170	05104500	Roseau River below South Fork near Malung, Minn.	04/07/1929	04/13/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
171	05106000	Sprague Creek near Sprague, Manitoba, Canada	05/30/1929	04/12/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
172	05107000	Pine Creek near Pine Creek, Minn.	04/08/1929	05/13/1953	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
173	05107500	Roseau River at Ross, Minn.	07/01/1919	04/17/2011	Historical peak flow(s) detected. Extended historical period back to 1919 to include 1919 and 1927 peak. Peak flow(s) exceeded high-outlier criterion. Accepted modified results from EMA	Yes.
174	05109000	Badger Creek near Badger, Minn.	04/07/1929	05/10/1938	Insufficient peak flows	No, insufficient peak flows.
175	05112000	Roseau River below State Ditch 51 near Caribou, Minn.	04/17/1917	04/25/2011	Historical peak flow(s) detected. Effect of historical peak is negligible, no historical period modification. Accepted default results from Bulletin 17B	Yes.
176	05124480	Kawishiwi River near Ely, Minn.	04/30/1967	05/11/2011	Accepted default results from Bulletin 17B	Yes.
177	05124500	Isabella River near Isabella, Minn.	06/03/1953	07/04/1977	Accepted default results from Bulletin 17B	Yes.
178	05124990	Filson Creek in SESW sec. 24 near Winton, Minn.	04/25/1975	04/24/1985	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
179	05125000	South Kawishiwi River near Ely, Minn.	04/26/1952	05/05/2011	Accepted default results from Bulletin 17B	No, out of StreamStats' range.
180	05125500	Stony River near Isabella, Minn.	06/03/1953	06/28/1964	Accepted default results from Bulletin 17B	Yes.
181	05125550	Stony River near Babbitt, Minn.	04/19/1976	05/12/2011	Accepted default results from Bulletin 17B	Yes.
182	05126000	Dunka River near Babbitt, Minn.	04/22/1952	04/20/1980	Accepted default results from Bulletin 17B	Yes.
183	05126210	South Kawishiwi River above White Iron Lake near Ely, Minn.	04/22/1976	05/11/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, out of StreamStats' range.
184	05126500	Bear Island River near Ely, Minn.	06/01/1953	09/12/1977	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
185	05127000	Kawishiwi River near Winton, Minn.	06/12/1906	09/17/2011	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
186	05127205	Burntside River near Ely, Minn.	06/14/1968	10/12/1977	Accepted default results from Bulletin 17B	Yes.
187	05127207	Bjorkman's Creek near Ely, Minn.	06/10/1970	05/29/1978	Insufficient peak flows	No, insufficient peak flows.
188	05127210	Armstrong Creek near Ely, Minn.	06/09/1968	05/29/1978	Accepted default results from Bulletin 17B	Yes.
189	05127215	Longstorff Creek near Ely, Minn.	06/08/1968	05/29/1978	Accepted default results from Bulletin 17B	Yes.
190	05127219	Shagawa Lake tributary at Ely, Minn.	06/17/1971	05/29/1978	Insufficient peak flows	No, insufficient peak flows.
191	05127220	Burgo Creek near Ely, Minn.	06/08/1968	05/30/1978	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
192	05127230	Shagawa River at Ely, Minn.	06/15/1968	10/14/1977	Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	Yes.
193	05127500	Basswood River near Winton, Minn.	07/20/1926	05/14/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, large drainage basin.
194	05128000	Namakan River at outlet of Lac La Croix, Ontario, Canada	05/24/1997	07/22/2010	Accepted default results from Bulletin 17B	No, large drainage basin.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
195	05128300	Pike River near Gilbert, Minn.	04/15/1966	06/28/1981	Accepted default results from Bulletin 17B	Yes.
196	05128340	Pike River near Biwabik, Minn.	09/06/1977	07/18/1978	Insufficient peak flows	No, insufficient peak flows.
197	05128500	Pike River near Embarrass, Minn.	05/01/1950	04/23/1979	Historical peak flow(s) detected. Extended historical period back to 1943 to include 1950 peak flow based on streamgage 05131000. Used a perception threshold of 2,400 from 1943 to 1953, and from 1965 to 1976. Accepted modified results from EMA	Yes.
198	05128700	Pike River tributary near Wahlsten, Minn.	04/15/1961	06/28/1981	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
199	05129000	Vermilion River below Vermilion Lake near Tower, Minn.	05/19/1912	05/02/1981	Accepted default results from Bulletin 17B	Yes.
200	05129115	Vermilion River near Crane Lake, Minn.	04/01/1979	04/14/2011	Accepted default results from Bulletin 17B	Yes.
201	05129290	Gold Portage Outlet from Kabetogama Lake near Ray, Minn.	07/09/1983	06/07/2011	Used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, out of StreamStats' range.
202	05129650	Little Fork River at Cook, Minn.	06/10/1968	06/10/1984	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
203	05129710	Johnson Creek near Britt, Minn.	04/21/1961	04/30/1975	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
204	05130300	Boriin Creek near Chisholm, Minn.	09/06/1959	04/08/1992	Accepted default results from Bulletin 17B	Yes.
205	05130500	Sturgeon River near Chisholm, Minn.	04/10/1943	04/17/2009	Accepted default results from Bulletin 17B	Yes.
206	05131000	Dark River near Chisholm, Minn.	04/11/1943	04/20/1979	Accepted default results from Bulletin 17B	Yes.
207	05131448	Wood Duck Creek near Nett Lake, Minn.	05/01/1996	05/26/2005	Insufficient peak flows	No, insufficient peak flows.
208	05131455	Nett Lake River near Nett Lake, Minn.	05/01/1996	05/31/2005	Insufficient peak flows	No, insufficient peak flows.
209	05131500	Little Fork River at Littlefork, Minn.	04/19/1910	04/13/2011	Accepted default results from Bulletin 17B	Yes.
210	05131750	Big Fork River near Bigfork, Minn.	04/21/1973	04/12/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
211	05131878	Bowerman Brook near Craigville, Minn.	04/21/1979	04/11/2011	Accepted default results from Bulletin 17B	Yes.
212	05132000	Big Fork River at Big Falls, Minn.	04/19/1910	04/13/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
213	05133500	Rainy River at Manitou Rapids, Minn.	10/23/1928	04/14/2011	Drainage area too large to use regional skew, used station skew. Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	No, large drainage basin.
214	05134100	North Branch Rapid River near Baudette, Minn.	03/31/1986	04/12/2011	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
215	05134200	Rapid River near Baudette, Minn.	05/11/1950	04/11/2011	Historical peak flow(s) detected. Extended historical period back to 1950 to include 1950 peak. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	Yes.
216	05137000	Winter Road River near Baudette, Minn.	03/31/1986	04/12/2011	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
217	05139500	Warroad River near Warroad, Minn.	03/25/1946	04/07/1980	Accepted default results from Bulletin 17B	Yes.
218	05140000	Bulldog Run near Warroad, Minn.	03/22/1946	03/09/1983	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
219	05140500	East Branch Warroad River near Warroad, Minn.	03/24/1946	06/22/1983	Accepted default results from Bulletin 17B	Yes.
220	05200200	Hennepin Creek near Becida, Minn.	04/20/1979	08/14/2000	Accepted default results from Bulletin 17B	Yes.
221	05200445	Mississippi River at Bemidji, Minn.	09/09/1973	04/11/2011	Accepted default results from Bulletin 17B	Yes.
222	05200450	Schoolcraft River near Bemidji, Minn.	04/21/1988	04/26/1989	Insufficient peak flows	No, insufficient peak flows.
223	05200510	Mississippi River near Bemidji, Minn.	04/18/1988	05/04/2011	Accepted default results from Bulletin 17B	Yes.
224	05201500	Mississippi River at Winnibigoshish Dam, Minn.	06/22/1982	07/06/1994	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
225	05205200	Boy River near Remer, Minn.	04/03/1986	06/28/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
226	05206500	Leech Lake River at Federal Dam, Minn.	05/17/1982	11/19/1993	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
227	05207600	Mississippi River at Willow Beach at Ball Club, Minn.	06/16/2008	02/18/2011	Insufficient peak flows	No, insufficient peak flows.
228	05210200	Smith Creek near Hill City, Minn.	05/14/1961	06/11/2000	Accepted default results from Bulletin 17B	Yes.
229	05211000	Mississippi River at Grand Rapids, Minn.	03/20/1942	06/29/2011	Affected by regulation, used station skew. Peak flow not used because of dam break. Accepted modified results from Bulletin 17B	No, station skew.
230	05212700	Prairie River near Taconite, Minn.	06/16/1968	04/16/2011	Accepted default results from Bulletin 17B	Yes.
231	05216700	O'Brien Creek near Nashwauk, Minn.	04/18/1959	04/18/1972	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
232	05216800	O'Brien Creek near Pengilly, Minn.	06/24/1964	06/08/1968	Insufficient peak flows	No, insufficient peak flows.
233	05216820	Initial Tailings Basin outfall near Keewatin, Minn.	10/06/1982	04/23/1985	Insufficient peak flows	No, insufficient peak flows.
234	05216860	Swan River near Calumet, Minn.	05/08/1964	05/01/1990	Accepted default results from Bulletin 17B	Yes.
235	05216980	Swan River tributary at Warba, Minn.	04/21/1961	07/18/1985	Accepted default results from Bulletin 17B	Yes.
236	05217000	Swan River near Warba, Minn.	05/01/1950	04/15/1969	Historical peak flow(s) detected. Extended historical period back to 1950 to include 1950 peak flow. Accepted modified results from EMA	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
237	05217700	Bluff Creek near Jacobson, Minn.	05/14/1961	04/23/1981	Accepted default results from Bulletin 17B	Yes.
238	05218000	Mississippi River above Sandy River near Libby, Minn.	07/18/1897	04/24/1927	Historical peak flow in 1927 represents the largest peak flow that occurred from 1915 through 1929 as noted in Water Supply Paper ² 605. Rerun with EMA	No, station skew.
239	05219000	Sandy River at Sandy Lake Dam, at Libby, Minn.	04/27/1982	05/07/1994	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
240	05220500	Mississippi River below Sandy River near Libby, Minn.	05/16/1930	06/12/1990	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
241	05220600	Mississippi River at Palisade, Minn.	04/18/2009	03/18/2010	Insufficient peak flows	No, insufficient peak flows.
242	05221020	Willow River below Palisade, Minn.	04/24/1972	04/10/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
243	05227500	Mississippi River at Aitkin, Minn.	03/27/1902	04/17/2011	Historical peak flow(s) detected. Extended historical period back to 1888 to include 1888 and 1899 peak flows. Affected by regulation, used station skew. Accepted modified results from Bulletin EMA.	No, station skew.
244	05229430	Hoblin Creek near Pine River, Minn.	07/08/2002	06/02/2007	Insufficient peak flows	No, insufficient peak flows.
245	05229450	Pine River near Pine River, Minn.	03/28/1986	04/11/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
246	05231000	Pine River at Cross Lake Dam, at Cross Lake, Minn.	05/22/1982	05/06/1994	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
247	05241500	Rabbit River near Crosby, Minn.	06/27/1946	06/10/1963	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
248	05242300	Mississippi River at Brainerd, Minn.	04/17/1988	05/09/2011	Drainage area too large for regional skew, used station skew. Accepted default results from Bulletin 17B	No, large drainage basin.
249	05242700	Little Sand Lake outlet near Dorset, Minn.	06/09/1932	06/11/1941	Accepted default results from Bulletin 17B	No, out of StreamStats ¹ range.
250	05243721	Straight River at County Road 125 near Osage, Minn.	05/22/1987	04/29/1991	Insufficient peak flows	No, insufficient peak flows.
251	05243723	Straight River at County Road 115 near Park Rapids, Minn.	07/22/1987	08/31/1989	Insufficient peak flows	No, insufficient peak flows.
252	05243725	Straight River near Park Rapids, Minn.	05/22/1987	04/13/2011	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
253	05244000	Crow Wing River at Nimrod, Minn.	05/29/1910	04/18/2011	Accepted default results from Bulletin 17B	Yes.
254	05244100	Kitten Creek near Sebeka, Minn.	05/14/1961	04/01/1978	Accepted default results from Bulletin 17B	Yes.
255	05244200	Cat River near Nimrod, Minn.	04/24/1961	04/17/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
256	05244440	Leaf River near Aldrich, Minn.	04/25/1972	04/11/2011	Accepted default results from Bulletin 17B	Yes.
257	05245100	Long Prairie River at Long Prairie, Minn.	07/22/1972	04/07/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
258	05245190	Eagle Creek tributary near Eagle Bend, Minn.	06/24/2003	04/02/2011	Insufficient peak flows	No, insufficient peak flows.
259	05245800	Sevenmile Creek near Pillager, Minn.	05/10/1979	05/30/1993	Accepted default results from Bulletin 17B	Yes.
260	05246000	Crow Wing River at Pillager, Minn.	03/19/1910	04/19/1950	Accepted default results from Bulletin 17B	No, large drainage basin.
261	05247000	Gull River at Gull Lake Dam near Brainerd, Minn.	04/21/1982	04/30/1994	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
262	05247500	Crow Wing River near Pillager, Minn.	04/14/1965	04/09/2011	Affected by regulation, used station skew. Historical peak flow(s) detected. Extended historical peak back to 1924 to include 1965 peak flow. Accepted modified results from EMA	No, station skew.
263	05261000	Mississippi River near Fort Ripley, Minn.	07/25/1972	05/05/2008	Drainage area too large to use regional skew, used station skew. Accepted default results from Bulletin 17B	No, large drainage basin.
264	05261520	Nokasippi River near Fort Ripley, Minn.	04/04/1986	04/07/2011	Accepted default results from Bulletin 17B	Yes.
265	05267000	Mississippi River near Royalton, Minn.	08/07/1924	04/11/2011	Drainage area too large to use regional skew, used station skew. Accepted default results from Bulletin 17B	No, large drainage basin.
266	05267800	Big Mink Creek tributary near Lastrup, Minn.	**/**/1961	04/04/1980	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
267	05267900	Hillman Creek near Pierz, Minn.	05/07/1964	05/09/2002	Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
268	05268000	Platte River at Royalton, Minn.	05/14/1930	04/07/2011	Accepted default results from Bulletin 17B	Yes.
269	05270150	Ashley Creek near Sauk Centre, Minn.	09/25/1986	04/04/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
270	05270170	Sauk River below dam at Sauk Centre, Minn.	04/05/1989	04/05/1989	Insufficient peak flows	No, insufficient peak flows.
271	05270300	Sauk River tributary at Spring Hill, Minn.	08/27/1960	07/09/2000	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
272	05270310	Sauk River tributary number 2 near St. Martin, Minn.	08/27/1960	04/23/1985	Peak flow(s) exceeded high-outlier criterion. Historical peak flow(s) detected. Extended historical period back to 1960 to include 1960 peak and forward to 2011 to account for peak that exceeded high-outlier criterion. Accepted modified results from EMA	Yes.
273	05270500	Sauk River near St. Cloud, Minn.	03/19/1910	07/20/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
274	05270700	Mississippi River at St. Cloud, Minn.	04/12/1989	04/13/2011	Affected by regulation, used station skew. Accepted modified results from Bulletin 17B	No, station skew.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
275	05271800	Johnson Creek tributary at Luxemburg, Minn.	08/29/1964	03/29/1989	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
276	05272000	Johnson Creek tributary number 2 near St. Augusta, Minn.	05/06/1964	06/27/1983	Accepted default results from Bulletin 17B	Yes.
277	05272300	Johnson Creek near St. Augusta, Minn.	04/13/1964	07/18/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
278	05272950	Clearwater River near South Haven, Minn.	09/09/1985	07/15/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
279	05273510	Mississippi River at Clearwater, Minn.	07/26/1972	05/02/1994	Drainage area too large to use regional skew, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, large drainage basin.
280	05273700	Otsego Creek near Otsego, Minn.	04/06/1964	03/26/1989	Accepted default results from Bulletin 17B	Yes.
281	05274200	Stony Brook tributary near Foley, Minn.	06/28/1960	03/26/1989	Accepted default results from Bulletin 17B	Yes.
282	05274700	St. Francis River at Santiago, Minn.	04/14/1965	06/15/1981	Insufficient peak flows	No, insufficient peak flows.
283	05274715	St. Francis River near Orrock, Minn.	09/19/1980	06/17/1981	Insufficient peak flows	No, insufficient peak flows.
284	05274750	St. Francis River near Zimmerman, Minn.	07/02/1983	06/15/1984	Insufficient peak flows	No, insufficient peak flows.
285	05274900	St. Francis River near Big Lake, Minn.	04/16/1965	04/28/1970	Insufficient peak flows	No, insufficient peak flows.
286	05275000	Elk River near Big Lake, Minn.	05/23/1911	04/10/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
287	05275500	Mississippi River at Elk River, Minn.	04/07/1916	04/13/1969	Historical peak flow(s) detected. Extended historical period forward to 1969 to include 1965 peak flow. Size of stream is too large for regional skew, used station skew. Used multiple Grubbs-Beck test. Accepted modified results from EMA	No, large drainage basin.
288	05276000	North Fork Crow River near Regal, Minn.	04/08/1944	03/02/1954	Accepted default results from Bulletin 17B	Yes.
289	05276005	North Fork Crow River above Paynesville, Minn.	04/10/1996	06/22/1998	Insufficient peak flows	No, insufficient peak flows.
290	05276100	North Fork Crow River tributary near Paynesville, Minn.	08/27/1960	03/15/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
291	05276200	North Fork Crow River at Paynesville, Minn.	03/16/1973	07/13/2000	Accepted default results from Bulletin 17B	Yes.
292	05278000	Middle Fork Crow River near Spicer, Minn.	04/25/1949	04/23/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
293	05278120	North Fork Crow River near Kingston, Minn.	03/20/1985	07/18/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
294	05278350	Fountain Creek near Montrose, Minn.	05/23/1962	09/07/1991	Historical peak flow(s) detected. Extended historical period forward to 1991 to include 1991 peak flow. Accepted modified results from EMA	Yes.
295	05278500	South Fork Crow River at Cosmos, Minn.	03/16/1945	04/15/1964	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
296	05278700	Otter Creek near Lester Prairie, Minn.	05/18/1961	03/28/1989	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
297	05278750	Otter Creek tributary near Lester Prairie, Minn.	05/23/1962	09/08/1991	Historical peak flow(s) detected. Extended historical period forward to 1991 to include 1991 peak flow. Accepted modified results from EMA	Yes.
298	05278850	Buffalo Creek tributary near Brownton, Minn.	**/**/1961	09/08/1991	Historical peak flow(s) detected. Extended historical period forward to 1991 to include 1991 peak flow. Accepted modified results from EMA	Yes.
299	05278880	Buffalo Creek near New Auburn, Minn.	04/03/1997	04/03/1997	Insufficient peak flows	No, insufficient peak flows.
300	05278930	Buffalo Creek near Glencoe, Minn.	05/28/1972	03/25/2011	Accepted default results from EMA	Yes.
301	05279000	South Fork Crow River near Mayer, Minn.	04/07/1934	09/13/1991	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
302	05279030	South Fork Crow River tributary near Mayer, Minn.	05/22/1962	06/16/1970	Insufficient peak flows	No, insufficient peak flows.
303	05280000	Crow River at Rockford, Minn.	03/15/1910	04/10/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, large drainage basin.
304	05280300	School Lake Creek tributary near St. Michael, Minn.	05/06/1964	06/16/1990	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from EMA	Yes.
305	05283500	Mississippi River at Anoka, Minn.	04/05/1897	05/26/1913	River/stream similar to streamgage 05288500. No analysis	No, large drainage basin.
306	05284100	Mille Lacs Lake tributary near Wealthwood, Minn.	04/18/1961	07/22/1972	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
307	05284305	Seguchie Creek at Holt Lake outlet, near Garrison	08/31/2004	10/06/2005	Insufficient peak flows	No, insufficient peak flows.
308	05284310	Seguchie Creek above mouth near Garrison, Minn.	06/11/2005	10/05/2005	Insufficient peak flows	No, insufficient peak flows.
309	05284600	Robinson Brook near Onamia, Minn.	07/16/1960	04/23/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
310	05284620	Rum River tributary near Onamia, Minn.	04/03/1960	04/23/1985	Accepted default results from Bulletin 17B	Yes.
311	05284920	Stanchfield Creek tributary near Day, Minn.	05/14/1961	04/23/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
312	05286000	Rum River near St. Francis, Minn.	05/17/1930	04/11/2011	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
313	05287890	Elm Creek near Champlin, Minn.	04/04/1979	03/24/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
314	05288500	Mississippi River near Anoka, Minn.	06/16/1931	04/11/2011	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
315	05288580	Rice Creek below old Highway 8 in Mounds View, Minn.	03/24/2009	07/16/2011	Insufficient peak flows	No, insufficient peak flows.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
316	05288696	Shingle Creek tributary at Zane Avenue in Brooklyn Park, Minn.	10/05/2007	08/19/2009	Insufficient peak flows	No, insufficient peak flows.
317	05288705	Shingle Creek at Queen Avenue in Minneapolis, Minn.	05/19/1996	07/16/2011	Affected by urbanization, used station skew. Accepted modified results from Bulletin 17B	No, station skew.
318	05288800	Bassett Creek at Duluth Street in Golden Valley, Minn.	09/10/1982	06/03/1983	Insufficient peak flows	No, insufficient peak flows.
319	05288810	North Fork Bassett Creek at 34th Avenue in Crystal, Minn.	05/17/1982	03/06/1983	Insufficient peak flows	No, insufficient peak flows.
320	05288840	Bassett Creek at Golden Valley Road in Golden Valley, Minn.	09/10/1982	03/06/1983	Insufficient peak flows	No, insufficient peak flows.
321	05288850	South Fork Bassett Creek at State Highway 55 in Golden Valley, Minn.	07/10/1982	07/03/1983	Insufficient peak flows	No, insufficient peak flows.
322	05288900	Bassett Creek at Fruen Mill, in Minneapolis, Minn.	09/10/1982	03/06/1983	Insufficient peak flows	No, insufficient peak flows.
323	05289500	Minnehaha Creek at Minnetonka Mills, Minn.	05/04/1954	06/01/1965	Accepted default results from Bulletin 17B	Yes.
324	05289800	Minnehaha Creek at Hiawatha Avenue in Minneapolis, Minn.	08/02/2006	07/16/2011	Insufficient peak flows	No, insufficient peak flows.
325	05290000	Little Minnesota River near Peever, S. Dak.	03/30/1940	07/28/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, out of StreamStats ¹ range.
326	05291000	Whetstone River near Big Stone City, S. Dak.	03/08/1910	06/23/2011	Historical peak flow(s) detected. Peak not used because of dam break. Accepted default results from Bulletin 17B	No, out of StreamStats ¹ range.
327	05292000	Minnesota River at Ortonville, Minn.	03/31/1938	04/09/2011	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
328	05292500	Minnesota River near Odessa, Minn.	03/09/1910	04/04/1963	Affected by regulation, used station skew. Accepted modified results from EMA	No, station skew.
329	05292704	North Fork Yellow Bank River near Odessa, Minn.	06/22/1991	06/23/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
330	05293000	Yellow Bank River near Odessa, Minn.	04/01/1940	06/24/2011	Accepted default results from Bulletin 17B	Yes.
331	05293245	Lake Ina tributary near Melby, Minn.	06/24/2003	05/09/2011	Insufficient peak flows	No, insufficient peak flows.
332	05293371	Pomme de Terre River below Elbow Lake, Minn.	06/23/1986	07/15/2011	Accepted default results from Bulletin 17B	Yes.
333	05294000	Pomme de Terre River at Appleton, Minn.	03/26/1931	04/06/2011	Accepted default results from Bulletin 17B	Yes.
334	05299100	Lazarus Creek tributary near Canby, Minn.	03/29/1960	06/16/1990	Accepted default results from Bulletin 17B	Yes.
335	05299650	Lac qui Parle River near Providence, Minn.	04/14/2001	03/17/2003	Insufficient peak flows	No, insufficient peak flows.
336	05299750	Florida Creek near Burr, Minn.	04/01/1983	03/23/2011	Accepted default results from Bulletin 17B	Yes.
337	05299800	West Branch Lac qui Parle River at Dawson, Minn.	04/13/2001	03/17/2003	Insufficient peak flows	No, insufficient peak flows.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
338	05300000	Lac qui Parle River near Lac qui Parle, Minn.	03/12/1911	03/26/2011	Peak flow(s) of zero flow not used. Accepted default results from EMA	Yes.
339	05301000	Minnesota River near Lac qui Parle, Minn.	04/04/1943	04/06/2011	Affected by regulation, used station skew. Historical peak flow(s) detected. Extended historical period to encompass 1997 peak flow. Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	No, station skew.
340	05301200	Minnesota River tributary near Montevideo, Minn.	03/29/1960	04/26/1975	Accepted default results from Bulletin 17B	Yes.
341	05302500	Little Chippewa River near Starbuck, Minn.	04/16/1979	04/05/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
342	05302970	Outlet Creek tributary near Starbuck, Minn.	07/19/1962	10/18/1984	Accepted default results from Bulletin 17B	Yes.
343	05303450	Hassel Creek near Clontarf, Minn.	07/19/1962	06/07/1980	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
344	05304000	Shakopee Creek near Benson, Minn.	03/30/1950	03/25/1954	Insufficient peak flows	No, insufficient peak flows.
345	05304500	Chippewa River near Milan, Minn.	04/12/1937	04/05/2011	Accepted default results from Bulletin 17B	Yes.
346	05305000	Chippewa River (TW) near Watson, Minn.	06/04/1911	04/05/2011	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
347	05305200	Spring Creek near Montevideo, Minn.	09/22/1959	03/09/2000	Low outlier(s) flagged by Bulletin 17B method. Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
348	05311000	Minnesota River at Montevideo, Minn.	03/17/1910	04/07/2011	Affected by regulation, used station skew. Accepted modified results from EMA	No, station skew.
349	05311200	North Branch Yellow Medicine River near Ivanhoe, Minn.	04/13/1960	05/31/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
350	05311250	North Branch Yellow Medicine River tributary near Wilno, Minn.	04/13/1960	10/18/1984	Accepted default results from Bulletin 17B	Yes.
351	05311300	North Branch Yellow Medicine tributary number 2 near Porter, Minn.	04/13/1960	04/13/1975	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
352	05311400	South Branch Yellow Medicine River at Minneota, Minn.	04/06/1960	03/22/2011	Accepted default results from Bulletin 17B	Yes.
353	05313500	Yellow Medicine River near Granite Falls, Minn.	06/14/1931	03/25/2011	Accepted default results from Bulletin 17B	Yes.
354	05313780	Hawk Creek near Maynard, Minn.	03/30/1950	06/05/2000	Historical peak flow(s) detected. Insufficient evidence to extend historical period. Low outlier(s) detected by Bulletin 17B method. Accepted default results from EMA	Yes.
355	05313800	Kandiyohi County Ditch Number 16 near Blomkest, Minn.	**/**/1959	05/27/1972	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
356	05314510	Chetomba Creek near Renville, Minn.	05/01/2006	06/13/2008	Insufficient peak flows	No, insufficient peak flows.
357	05314900	Redwood River at Ruthton, Minn.	03/10/1959	07/21/1981	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
358	05315000	Redwood River near Marshall, Minn.	03/30/1940	03/23/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
359	05315200	Prairie Ravine near Marshall, Minn.	06/17/1959	04/22/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
360	05316500	Redwood River near Redwood Falls, Minn.	03/21/1910	03/25/2011	Accepted default results from Bulletin 17B	Yes.
361	05316538	Ramsey Creek near Redwood Falls, Minn.	06/04/1991	03/24/2011	Accepted default results from Bulletin 17B	Yes.
362	05316550	West Fork Beaver Creek near Olivia, Minn.	06/26/1959	07/11/1981	Accepted default results from Bulletin 17B	Yes.
363	0531656290	West Fork Beaver Creek at 320 Street near Bechyn, Minn.	03/14/2007	03/14/2007	Insufficient peak flows	No, insufficient peak flows.
364	05316570	Beaver Creek near Beaver Falls, Minn.	05/30/1972	04/03/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
365	05316580	Minnesota River at Morton, Minn.	04/15/2001	04/04/2011	Drainage area too large to use regional skew, used station skew. Accepted default results from Bulletin 17B	No, large drainage basin.
366	05316690	Spring Creek tributary near Sleepy Eye, Minn.	03/03/1966	07/26/1990	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
367	05316700	Spring Creek near Sleepy Eye, Minn.	05/31/1959	05/18/2000	Accepted default results from Bulletin 17B	Yes.
368	05316770	Minnesota River at New Ulm, Minn.	07/28/1968	03/31/1976	Insufficient peak flows	No, insufficient peak flows.
369	05316800	Cottonwood River tributary near Balaton, Minn.	03/10/1959	03/11/1985	Accepted default results from Bulletin 17B	Yes.
370	05316850	Meadow Creek tributary near Marshall, Minn.	03/19/1961	03/16/1972	Accepted default results from Bulletin 17B	Yes.
371	05316900	Dry Creek near Jeffers, Minn.	03/14/1961	04/23/1985	Accepted default results from Bulletin 17B	Yes.
372	05316920	Cottonwood River tributary near Sanborn, Minn.	04/19/1966	04/26/1994	Accepted default results from Bulletin 17B	Yes.
373	05316950	Cottonwood River near Springfield, Minn.	04/08/1969	03/23/2011	Peak flow(s) exceeded high-outlier criterion. Historical peak flow(s) detected. Extended historical period back to 1969 to include 1969 peak flow. Accepted default results from EMA	Yes.
374	05317000	Cottonwood River near New Ulm, Minn.	03/11/1910	03/24/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
375	05317200	Little Cottonwood River near Courtland, Minn.	03/03/1974	03/19/2010	Accepted default results from Bulletin 17B	Yes.
376	05317330	Minnesota River tributary at State Highway 68 near Judson, Minn.	04/11/2001	07/15/2011	Insufficient peak flows	No, insufficient peak flows.
377	05317500	Minnesota River at Judson, Minn.	03/26/1939	04/13/1969	Drainage area too large to use regional skew, used station skew. Historical peak flow(s) detected. Extended historical period back to 1939 and forward to 1992 (1993 floods) based on 1965 and 1969 peak flows. Accepted default results from Bulletin 17B	No, large drainage basin.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
378	05317845	East Branch Blue Earth River near Walters, Minn.	08/21/1979	07/16/2011	Accepted default results from Bulletin 17B	Yes.
379	05317850	Foster Creek near Alden, Minn.	05/30/1959	07/10/1984	Accepted default results from Bulletin 17B	Yes.
380	05318000	East Branch Blue Earth River near Bricelyn, Minn.	04/07/1951	10/12/1986	Accepted default results from Bulletin 17B	Yes.
381	05318100	East Branch Blue Earth River tributary near Blue Earth, Minn.	05/21/1960	04/22/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
382	05318195	Elm Creek at County Road 103 near Trimont, Minn.	06/04/1991	06/04/1991	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
383	05318300	Watonwan River near Delft, Minn.	03/29/1960	05/11/2003	Accepted default results from Bulletin 17B	Yes.
384	05318890	South Fork Watonwan River near Odin, Minn.	03/31/1979	03/27/1997	Accepted default results from Bulletin 17B	Yes.
385	05318897	South Fork Watonwan River near Ormsby, Minn.	03/31/1979	03/23/2011	Peak flow(s) at or below the minimum recordable discharge. Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
386	05319490	Watonwan River above Garden City, Minn.	06/08/1972	03/12/1976	Insufficient peak flows	No, insufficient peak flows.
387	05319500	Watonwan River near Garden City, Minn.	04/03/1940	03/24/2011	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Historical peak flow(s) detected. Extended historical period to 70 years to encompass all three peak flows. Accepted modified results from EMA	Yes.
388	05320000	Blue Earth River near Rapidan, Minn.	03/12/1910	03/22/2011	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Extended historical period back to 1910 to include 1910 historical peak flow. Accepted modified results from EMA	No, station skew.
389	05320200	Le Sueur River tributary near Mankato, Minn.	05/30/1959	03/12/1985	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, small drainage basin.
390	05320270	Little Cobb River near Beauford, Minn.	06/21/1996	03/20/2011	Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
391	05320300	Cobb River tributary near Mapleton, Minn.	05/30/1959	03/12/1985	Accepted default results from Bulletin 17B	Yes.
392	05320400	Maple River tributary near Mapleton, Minn.	05/30/1959	03/13/1985	Accepted default results from Bulletin 17B	Yes.
393	05320440	Judicial Ditch Number 49 near Amboy, Minn.	03/30/1959	06/08/1972	Accepted default results from Bulletin 17B	Yes.
394	05320480	Maple River near Rapidan, Minn.	03/01/1972	03/20/2011	Accepted default results from Bulletin 17B	Yes.
395	05320500	Le Sueur River near Rapidan, Minn.	06/08/1940	03/21/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
396	05325000	Minnesota River at Mankato, Minn.	05/29/1903	03/26/2011	Drainage area too large to use regional skew, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	No, large drainage basin.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
397	05325100	Minnesota River tributary near North Mankato, Minn.	05/18/1961	04/30/1967	Insufficient peak flows	No, insufficient peak flows.
398	05325450	Minnesota River tributary below St. Peter, Minn.	02/25/2001	03/10/2010	Insufficient peak flows	No, insufficient peak flows.
399	05326100	Middle Branch Rush River near Gaylord, Minn.	04/02/1979	06/01/2000	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
400	05326189	South Branch Rush River at County Road 63 near Norseland, Minn.	04/03/2006	10/19/2007	Insufficient peak flows	No, insufficient peak flows.
401	05327000	High Island Creek near Henderson, Minn.	06/06/1974	07/15/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
402	05330000	Minnesota River near Jordan, Minn.	03/19/1935	03/28/2011	Drainage area too large to use regional skew, used station skew. Accepted default results from Bulletin 17B	No, large drainage basin.
403	05330150	Sand Creek tributary near Montgomery, Minn.	03/25/1961	08/27/1981	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
404	05330200	Rice Lake tributary near Montgomery, Minn.	05/21/1960	03/13/1985	Accepted default results from Bulletin 17B	Yes.
405	05330300	Sand Creek near New Prague, Minn.	05/21/1960	03/23/2011	Accepted default results from Bulletin 17B	Yes.
406	05330550	East Branch Raven Stream near New Prague, Minn.	05/21/1960	03/16/1985	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
407	05330600	Sand Creek tributary number 2 near Jordan, Minn.	05/21/1960	03/13/1985	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
408	05330800	Purgatory Creek at Eden Prairie, Minn.	03/30/1976	06/07/1980	Insufficient peak flows	No, insufficient peak flows.
409	05330900	Nine Mile Creek at Bloomington, Minn.	07/16/1963	07/22/1972	Accepted default results from Bulletin 17B	Yes.
410	05330920	Minnesota River at Fort Snelling State Park, Minn.	06/17/2004	10/02/2010	Insufficient peak flows	No, insufficient peak flows.
411	05331000	Mississippi River at St. Paul, Minn.	05/06/1893	03/29/2011	Drainage area too large to use regional skew, used station skew. Accepted modified results from Bulletin 17B	No, large drainage basin.
412	05331580	Mississippi River below Lock and Dam Number 2 at Hastings, Minn.	04/13/1997	04/12/2011	Drainage area too large to use regional skew, used station skew. Accepted modified results from Bulletin 17B	No, large drainage basin.
413	05333500	St. Croix River near Danbury, Wis.	04/24/1914	08/03/2011	Accepted default results from Bulletin 17B	No, out of StreamStats ¹ range.
414	05335170	Crooked Creek near Hinckley, Minn.	04/02/1986	08/03/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
415	05336000	St. Croix River near Grantsburg, Wis.	04/24/1923	03/16/2010	Accepted default results from Bulletin 17B	No, large drainage basin.
416	05336200	Glaisby Brook near Kettle River, Minn.	04/25/1960	10/27/2010	Accepted default results from Bulletin 17B	Yes.
417	05336300	Moose Horn River tributary at Moose Lake, Minn.	04/24/1960	07/16/1981	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
418	05336550	Wolf Creek tributary near Sandstone, Minn.	03/29/1960	05/24/1989	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
419	05336600	Kettle River tributary at Sandstone, Minn.	04/04/1960	06/14/1981	Accepted default results from Bulletin 17B	Yes.
420	05336700	Kettle River below Sandstone, Minn.	04/01/1965	10/28/2010	Historical peak flow(s) detected. Extended historical period back to 1950 to include 1965 peak flow. Accepted default results from EMA	Yes.
421	05337400	Knife River near Mora, Minn.	04/28/1975	04/23/2001	Accepted default results from Bulletin 17B	Yes.
422	05338200	Mission Creek near Hinckley, Minn.	03/29/1960	10/19/1984	Accepted default results from Bulletin 17B	Yes.
423	05338500	Snake River near Pine City, Minn.	07/02/1914	04/11/2011	Historical peak flow(s) detected. Extended historical period back to 1914 to include 1950 peak flow. Accepted modified results from EMA	Yes.
424	05339500	St. Croix River near Rush City, Minn.	04/24/1923	05/17/1961	Accepted default results from Bulletin 17B	No, large drainage basin.
425	05339747	Goose Creek at Harris, Minn.	05/12/1986	04/11/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
426	05340000	Sunrise River near Stacy, Minn.	03/29/1949	04/15/1965	Accepted default results from Bulletin 17B	Yes.
427	05340050	Sunrise River near Lindstrom, Minn.	03/19/1966	04/04/1985	Accepted default results from Bulletin 17B	Yes.
428	05340500	St. Croix River at St. Croix Falls, Wis.	07/10/1902	10/30/2010	Drainage area too large to use regional skew, used station skew. Accepted modified results from Bulletin 17B	No, out of StreamStats ¹ range.
429	05344490	St. Croix River at Prescott, Wis.	04/29/2008	10/31/2010	Insufficient peak flows	No, insufficient peak flows.
430	05344500	Mississippi River at Prescott, Wis.	03/25/1929	04/12/2011	Drainage area too large to use regional skew, used station skew. Accepted default results from Bulletin 17B	No, large drainage basin.
431	05345000	Vermillion River near Empire, Minn.	09/18/1942	07/16/2011	Accepted default results from Bulletin 17B	Yes.
432	05345900	Vermillion River tributary near Hastings, Minn.	12/28/1959	05/30/1905	Historical peak flow(s) detected. Insufficient evidence to extend historical period. Accepted default results from EMA	Yes.
433	05346000	Vermillion River at Hastings, Minn.	03/12/1990	03/12/1990	Insufficient peak flows	No, insufficient peak flows.
434	05348550	Cannon River below Sabre Lake near Kilkenny, Minn.	03/16/1985	07/16/2011	Accepted default results from Bulletin 17B	Yes.
435	05352700	Turtle Creek tributary number 2 near Pratt, Minn.	05/21/1960	03/11/1985	Accepted default results from Bulletin 17B	Yes.
436	05352800	Turtle Creek tributary near Steele Center, Minn.	05/21/1960	03/11/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
437	05353800	Straight River near Faribault, Minn.	03/04/1966	03/23/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
438	05355024	Cannon River at Northfield, Minn.	03/19/1980	03/22/2011	Peak flow(s) at or below the minimum recordable discharge. Used multiple Grubbs Beck test. Accepted modified results from EMA	Yes.
439	05355100	Little Cannon River tributary near Kenyon, Minn.	06/23/1960	09/21/1986	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
440	05355150	Pine Creek near Cannon Falls, Minn.	03/27/1960	03/18/1980	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
441	05355200	Cannon River at Welch, Minn.	06/04/1911	03/23/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
442	05355230	Cannon River tributary near Welch, Minn.	07/02/1960	05/05/1981	Accepted default results from Bulletin 17B	No, small drainage basin.
443	05355250	Mississippi River at Red Wing, Minn.	04/12/1997	04/08/1998	Insufficient peak flows	No, insufficient peak flows.
444	05372800	South Fork Zumbro River on belt line at Rochester, Minn.	**/**/1969	07/01/1983	Peak flow(s) exceeded high-outlier criterion. Matched period of 59 years based on South Fork Zumbro River (streamgage 05372995). Accepted modified results from Bulletin 17B	Yes.
445	05372930	Bear Creek at Rochester, Minn.	04/04/1969	03/04/1983	Peak flow(s) exceeded high-outlier criterion. Matched period of 59 years based on South Fork Zumbro River (streamgage 05372995). Accepted modified results from Bulletin 17B	Yes.
446	05372950	Silver Creek at Minnesota Department of Natural Resources gage in Rochester, Minn.	04/04/1969	03/03/1983	Peak flow(s) exceeded high-outlier criterion. Matched period of 59 years based on South Fork Zumbro River (streamgage 05372995). Accepted modified results from Bulletin 17B	Yes.
447	05372990	Cascade Creek at Rochester, Minn.	04/04/1969	07/04/1983	Accepted default results from Bulletin 17B	Yes.
448	05372995	South Fork Zumbro River at Rochester, Minn.	07/21/1951	07/16/2011	Accepted default results from Bulletin 17B	Yes.
449	05373000	South Fork Zumbro River near Rochester, Minn.	07/21/1951	07/12/1981	River/stream similar to streamgage 05372995. No analysis	No analysis.
450	05373080	Milliken Creek near Concord, Minn.	08/29/1979	07/15/2011	Accepted default results from Bulletin 17B	Yes.
451	05373350	Zumbro River tributary near South Troy, Minn.	06/17/1962	03/11/1985	Accepted default results from Bulletin 17B	Yes.
452	05373700	Spring Creek near Wanamingo, Minn.	05/31/1960	09/21/1986	Accepted default results from Bulletin 17B	Yes.
453	05373900	Trout Brook tributary near Goodhue, Minn.	06/29/1960	09/21/1986	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
454	05374000	Zumbro River at Zumbro Falls, Minn.	11/15/1909	03/24/2011	Accepted default results from Bulletin 17B	Yes.
455	05374400	Long Creek near Potsdam, Minn.	03/04/1966	07/07/1990	Accepted default results from Bulletin 17B	Yes.
456	05374500	Zumbro River at Theilman, Minn.	09/11/1938	04/02/1956	Accepted default results from Bulletin 17B	Yes.
457	05374900	Zumbro River at Kellogg, Minn.	03/13/1976	07/09/1990	Accepted default results from Bulletin 17B	Yes.
458	05375800	East Indian Creek tributary near Weaver, Minn.	05/29/1962	04/28/1975	Accepted default results from Bulletin 17B	Yes.
459	05376000	North Fork Whitewater River near Elba, Minn.	07/11/1940	07/02/1993	Accepted default results from Bulletin 17B	Yes.
460	05376100	Middle Fork Whitewater River near St. Charles, Minn.	07/21/1991	05/16/1992	Insufficient peak flows	No, insufficient peak flows.
461	05376110	Middle Fork Whitewater River at State Park near St. Charles, Minn.	09/21/1986	03/25/1996	Insufficient peak flows	No, insufficient peak flows.
462	05376500	South Fork Whitewater River near Altura, Minn.	07/10/1940	10/12/1986	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
463	05376800	Whitewater River near Beaver, Minn.	09/01/1938	08/23/1999	Historical peak flow(s) detected. Extended historical period back to 1938 to include 1938 peak flow. Accepted modified results from EMA	Yes.
464	05377500	Whitewater River at Beaver, Minn.	09/01/1938	04/02/1956	Historical peak flow(s) detected. Extended historical period back to 1938 to include 1938 peak flow. Accepted modified results from EMA	Yes.
465	05378220	Garvin Brook at Stockton, Minn.	05/31/1982	07/21/1991	Insufficient peak flows	No, insufficient peak flows.
466	05378230	Stockton Valley Creek at Stockton, Minn.	05/31/1982	03/11/1985	Insufficient peak flows	No, insufficient peak flows.
467	05378235	Garvin Brook near Minnesota City, Minn.	05/31/1982	07/21/1991	Accepted default results from Bulletin 17B	Yes.
468	05378300	Straight Valley Creek near Rollingstone, Minn.	06/26/1959	03/11/1985	Accepted default results from Bulletin 17B	Yes.
469	05378500	Mississippi River at Winona, Minn.	04/03/1929	04/15/2011	Drainage area too large to use regional skew, used station skew. Accepted default results from Bulletin 17B	No, large drainage basin.
470	05379000	Gilmore Creek at Winona, Minn.	03/29/1940	07/21/1991	Historical peak flow(s) detected. Extended historical period forward to 2011 to include 1991 peak flow. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	Yes.
471	05380100	Cedar Creek near Ridgeway, Minn.	04/07/2001	03/23/2011	Insufficient peak flows	No, insufficient peak flows.
472	05383600	North Branch Root River tributary near Stewartville, Minn.	06/04/1958	03/11/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
473	05383700	Mill Creek tributary near Chatfield, Minn.	08/21/1959	04/28/1975	Accepted default results from Bulletin 17B	Yes.
474	05383720	Mill Creek near Chatfield, Minn.	03/28/1962	03/11/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
475	05383850	South Fork Bear Creek near Grand Meadow, Minn.	03/28/1962	03/11/1985	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
476	05383950	Root River near Pilot Mound, Minn.	05/12/2003	03/24/2011	Insufficient peak flows	No, insufficient peak flows.
477	05384000	Root River near Lanesboro, Minn.	03/09/1910	06/02/2000	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
478	05384100	Duschee Creek near Lanesboro, Minn.	06/25/1959	06/09/1984	Accepted default results from Bulletin 17B	Yes.
479	05384120	South Branch Root River at Lanesboro, Minn.	**/**/1973	**/**/1988	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
480	05384150	Root River tributary near Whalan, Minn.	06/25/1959	07/11/1981	Accepted default results from Bulletin 17B	No, small drainage basin.
481	05384200	Gribben Creek near Whalen, Minn.	06/25/1959	03/11/1985	Accepted default results from Bulletin 17B	Yes.
482	05384300	Big Springs Creek near Arendahl, Minn.	06/25/1959	02/27/1981	Accepted default results from Bulletin 17B	Yes.
483	05384350	Root River at Rushford, Minn.	03/11/1985	03/24/2011	Accepted default results from Bulletin 17B. Peak flow(s) missing due to insufficient rating	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
484	05384400	Pine Creek near Arendahl, Minn.	03/24/1959	03/11/1985	Low outlier(s) flagged by Bulletin 17B method. Used a fixed low-outlier threshold. Accepted modified results from EMA	Yes.
485	05384500	Rush Creek near Rushford, Minn.	06/28/1942	03/24/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
486	05384800	Campbell Creek near Money Creek, Minn.	04/06/2001	03/21/2011	Insufficient peak flows	No, insufficient peak flows.
487	05385000	Root River near Houston, Minn.	03/07/1910	03/24/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
488	05385500	South Fork Root River near Houston, Minn.	03/26/1950	06/19/2011	Historical peak flow(s) detected. Effect of historical peak is negligible, no historical period modification. Accepted default results from Bulletin 17B	Yes.
489	05386000	Root River below South Fork near Houston, Minn.	09/10/1938	03/27/1961	Accepted default results from Bulletin 17B	Yes.
490	05387030	Crooked Creek at Freeburg, Minn.	07/04/1979	06/18/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
491	05455940	Cedar River at Lansing, Minn.	06/22/2007	03/23/2011	Insufficient peak flows	No, insufficient peak flows.
492	05457000	Cedar River near Austin, Minn.	11/14/1909	03/23/2011	Accepted default results from Bulletin 17B	Yes.
493	05457080	Rose Creek tributary near Dexter, Minn.	08/31/1962	03/11/1985	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
494	05457778	Little Cedar River near Johnsburg, Minn.	09/09/1986	03/23/2011	Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
495	05458950	Shell Rock River tributary near Albert Lea, Minn.	06/23/1960	08/06/1968	Insufficient peak flows	No, insufficient peak flows.
496	05458960	Bancroft Creek at Bancroft, Minn.	07/06/1986	07/16/2011	Accepted default results from Bulletin 17B	Yes.
497	05474750	Beaver Creek tributary number 2 near Slayton, Minn.	05/17/1961	06/25/1985	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
498	05474760	Beaver Creek tributary above Slayton, Minn.	05/17/1961	10/15/1984	Accepted default results from Bulletin 17B	Yes.
499	05474900	Elk Creek on County State Aid Highway 1, near Brewster, Minn.	06/17/1996	07/12/2011	Accepted default results from Bulletin 17B. Peak flow(s) missing due to insufficient rating	Yes.
500	05475000	Heron Lake outlet near spillway, County Highway 24, Heron Lake, Minn.	10/01/1930	06/19/1943	Affected by regulation, used station skew. Low outlier(s) flagged by Bulletin 17B method. Accepted modified results from EMA	No, station skew.
501	05475400	Warren Lake tributary near Windom, Minn.	03/29/1960	07/07/1987	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
502	05475800	Des Moines River tributary near Jackson, Minn.	10/30/1959	04/23/1985	Accepted default results from Bulletin 17B	Yes.
503	05475900	Des Moines River tributary number 2 near Lakefield, Minn.	03/29/1960	04/23/1985	Accepted default results from Bulletin 17B	Yes.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
504	05476000	Des Moines River at Jackson, Minn.	06/30/1909	03/26/2011	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
505	05476010	Nelson Creek at Jackson, Minn.	05/30/1959	04/22/1975	Historical peak flow(s) detected. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
506	05476100	Story Brook near Petersburg, Minn.	03/29/1960	07/20/1972	Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
507	05476900	Fourmile Creek near Dunnell, Minn.	05/21/1960	05/18/2000	Accepted default results from Bulletin 17B	Yes.
508	05476989	East Fork Des Moines River above Ceylon, Minn.	03/28/1986	07/14/2011	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
509	06482500	North Branch Pipestone Creek near Pipestone, Minn.	06/22/1991	03/23/2011	Accepted default results from Bulletin 17B. Peak flow(s) missing due to insufficient rating	Yes.
510	06482525	Pipestone Creek near Jasper, Minn.	03/15/2007	09/23/2010	Insufficient peak flows	No, insufficient peak flows.
511	06482745	Beaver Creek at Valley Springs, S. Dak.	09/24/1986	03/18/2011	Accepted default results from Bulletin 17B. Peak flow(s) missing due to insufficient rating	No, out of StreamStats ¹ range.
512	06482910	Rock Creek tributary at County Highway 18 near Hatfield, Minn.	06/26/2001	03/23/2011	Low outlier(s) flagged by Bulletin 17B method. Peak flow(s) missing due to insufficient rating. Accepted default results from EMA	Yes.
513	06482933	Chanarambie Creek near Edgerton, Minn.	04/17/1979	04/17/1979	Peak flow(s) at or below the minimum recordable discharge. Accepted default results from EMA	Yes.
514	06482950	Mound Creek near Hardwick, Minn.	05/28/1959	05/16/1985	Accepted default results from Bulletin 17B	Yes.
515	06482960	Mound Creek tributary at Hardwick, Minn.	05/28/1959	06/18/1996	Accepted default results from Bulletin 17B	Yes.
516	06482970	Champepadan Creek at County Road 18 near Leota, Minn.	06/18/1996	06/15/2011	Insufficient peak flows	No, insufficient peak flows.
517	06483000	Rock River at Luverne, Minn.	10/07/1911	07/15/2011	Historical peak flow(s) detected. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
518	06483020	Elk Creek near Lismore, Minn.	06/23/1996	04/07/2006	Insufficient peak flows	No, insufficient peak flows.
519	06483050	Rock River tributary near Luverne, Minn.	05/30/1959	03/11/1972	Accepted default results from Bulletin 17B	Yes.
520	06483200	Kanaranzi Creek tributary near Lismore, Minn.	05/30/1959	07/10/1993	Historical peak flow(s) detected. Extended historical period forward to 2006 based on streamgage 06603530. Accepted default results from EMA	Yes.
521	06483210	Kanaranzi Creek tributary number 2 near Wilmont, Minn.	08/14/1966	07/10/1993	Historical peak flow(s) detected. Extended historical period forward to 2006 based on streamgage 06603530. Low outlier(s) flagged by Bulletin 17B method. Accepted default results from EMA	Yes.
522	06483220	East Branch Kanaranzi Creek tributary near Adrian, Minn.	05/30/1959	04/27/1964	Insufficient peak flows	No, insufficient peak flows.
523	06483240	Kanaranzi Creek near Kanaranzi, Minn.	03/01/2007	11/20/2012	Insufficient peak flows	No, insufficient peak flows.

Table 1–1. Streamgages in and bordering Minnesota with peak-flow data through water year 2011.—Continued

[Bulletin 17B method (Interagency Advisory Committee on Water Data, 1982). EMA, expected moments algorithm (Cohn and others, 1997); **/**, month and day of occurrence unknown]

Map number (fig. 1)	Streamgage number	Streamgage name	Start of systematic record	End of systematic record	Peak-flow analysis comments	Weighting of independent estimates (WIE) calculated?
524	06483350	Little Rock River near Rushmore, Minn.	06/06/1991	07/14/2011	Peak flow(s) exceeded maximum recordable discharge. Modified perception thresholds on peak flow(s). Accepted modified results from EMA	Yes.
525	06483353	Little Rock Creek near Rushmore, Minn.	06/22/1996	07/14/2011	Accepted default results from Bulletin 17B	Yes.
526	06603000	Little Sioux River near Lakefield, Minn.	04/04/1949	04/04/1963	Peak flow(s) exceeded high-outlier criterion. Insufficient evidence to extend historical period. Accepted default results from Bulletin 17B	Yes.
527	06603500	Jackson County Ditch Number 11 near Lakefield, Minn.	03/24/1949	03/29/1960	Accepted default results from Bulletin 17B	Yes.
528	06603520	Judicial Ditch Number 28 tributary near Spafford, Minn.	05/30/1959	03/11/1972	Accepted default results from Bulletin 17B	Yes.
529	06603530	Little Sioux River near Spafford, Minn.	04/06/1962	07/14/2011	Accepted default results from Bulletin 17B	Yes.
530	465839096412800	Buffalo River East of Kragnes, Minn.	04/06/2011	04/06/2011	Insufficient peak flows	No, insufficient peak flows.

¹U.S. Geological Survey (2013b).²Grover and others (1929).

Appendix 2. Streamgage Report Files

For each of the 409 streamgages for which peak-flow frequency analyses were completed, a streamgage report file is provided in portable document format (PDF) in the [downloads directory for appendix 2](#) of this report. The streamgage report files present the specifications of the analyses, the results of the peak-flow analyses, and the peak-flow data. These report files summarize information from all analytical methods. The streamgage report files are described and examples provided in the “Explanation and Example of a Streamgage Report File” section of the report.

Appendix 3. Streamgage Graph Files

For each of the 409 streamgages for which peak-flow frequency analyses were completed, a streamgage graph file is provided in portable document format (PDF) in the [downloads directory for appendix 3](#) of this report. Each streamgage graph file is composed of one page containing two graphs: one normal and one Pearson type III. Each graph has either the expected moments algorithm (EMA) or Bulletin 17B frequency estimate (with respective confidence limits) and the annual peak flows. If applicable, the graphs also indicate historical peak flows (blue dots), historical thresholds, low-outlier thresholds, and peak flows with “<” and “>” symbols (censored values). The streamgage graph files are described and examples provided in the “Explanation and Examples of Streamgage Graph Files” section of the report.

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