

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05134100 North Branch Rapid River near Baudette, Minn.

**Peak-flow information:**

Number of systematic peak flows in record	26
Systematic period begins	1986
Systematic period ends	2011
Length of systematic record	26
Years without information	0
Number of historical peak flows in record	0

**Frequency analysis options:**

Method	Expected moments algorithm (EMA)
Skew option	Weighted
Generalized skew	-0.42
Standard error of generalized skew	0.4266
Low-outlier method	Single Grubbs-Beck test

**EMA systematic record analysis results:**

**Moments of the common logarithms of the peak flows:**

	Standard	
Mean	deviation	Skewness
2.8429	0.3602	0.101

**Low-outlier information:**

Number of low outliers	1
Low-outlier threshold	150

**Final analysis results:**

**Moments of the common logarithms of the peak flows:**

	Standard	
Mean	deviation	Skewness
2.8414	0.3643	-0.214

**Annual frequency curve at selected exceedance probabilities:**

[WIE, Weighted independent estimate; --, not computed]

Exceedance probability	Peak estimate	Lower-95 level	Upper 95 level	WIE estimate	Lower-95 WIE level	Upper 95 WIE level
0.9950	67.6	9.19	131	--	--	--
0.9900	86.5	15.40	156	--	--	--
0.9500	166.0	61.60	261	--	--	--
0.9000	233.0	113.00	347	--	--	--
0.8000	346.0	206.00	496	--	--	--
0.6667	496.0	328.00	698	--	--	--
0.5000	715.0	499.00	1,010	689	515	922
0.4292	829.0	585.00	1,170	--	--	--
0.2000	1,420.0	1,010.00	2,150	1,360	1,000	1,840
0.1000	1,990.0	1,390.00	3,380	1,890	1,350	2,660
0.0400	2,830.0	1,900.00	5,860	2,640	1,770	3,930
0.0200	3,530.0	2,280.00	8,610	3,230	2,060	5,060
0.0100	4,280.0	2,630.00	12,400	3,840	2,320	6,360
0.0050	5,090.0	2,970.00	17,500	--	--	--
0.0020	6,250.0	3,380.00	27,100	5,310	2,840	9,930

**Peak-flow data used in the analysis:**

Explanation of symbols and codes

-- none

\* Less than low-outlier threshold

Water	Peak	Peak-flow
year	flow	code
1986	1,000	--
1987	365	--
1988	150	--
1989	600	--
1990	50	*
1991	490	--
1992	920	--
1993	270	--
1994	340	--
1995	450	--
1996	1,550	--
1997	1,150	--
1998	595	--
1999	1,190	--
2000	710	--
2001	1,630	--
2002	6,380	--
2003	275	--
2004	981	--
2005	610	--
2006	912	--
2007	953	--
2008	526	--
2009	1,500	--
2010	827	--
2011	1,390	--