Annual Peak-Flow Frequency Analysis
For more information on the contents of this documentation, see Kessler and others (2013).

Streamgage number and name:
05076000 Thief River near Thief River Falls, Minn.

Peak-flow information:
Number of systematic peak flows in record	100
Systematic period begins	1909
Systematic period ends	2011
Length of systematic record	103
Years without information	3
Number of historical peak flows in record	0

Frequency analysis options:
Method	Expected moments algorithm (EMA)
Skew option	Weighted
Generalized skew	-0.49
Standard error of generalized skew	0.427
Low-outlier method	Bulletin 17B Grubbs-Beck test

Bulletin 17B systematic record analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
3.1299	0.4164	-1.607

Outlier criteria and number of peak flows exceeding:

Low	74.8	2
High	16937.5	0

Expected moments algorithm (EMA) Final analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
3.1352	0.3988	-1.007

Annual frequency curve at selected exceedance probabilities:

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	NA	NA	NA
0.9900	NA	NA	NA
0.9500	243	119	355
0.9000	399	243	538
0.8000	682	494	866
0.6667	1,060	833	1,300
0.5000	1,590	1,300	1,910
0.4292	1,850	1,530	2,210
0.2000	2,980	2,540	3,490
0.1000	3,840	3,300	4,580
0.0400	4,770	3,930	5,990
0.0200	5,350	4,190	7,060
0.0100	5,840	4,350	8,160
0.0050	6,260	4,450	9,320
0.0020	6,710	4,550	11,000

Peak-flow data used in the analysis:

Explanation of symbols and codes
   −−   none
   ∗   Less than low-outlier threshold

Water year	Peak flow	Peak-flow code		Water year	Peak flow	Peak-flow code
1909	1,970	−−		1947	1,560	−−
1910	1,440	−−		1948	1,850	−−
1911	127	−−		1949	1,620	−−
1912	164	−−		1950	5,610	−−
1913	1,250	−−		1951	1,630	−−
1914	795	−−		1952	1,500	−−
1915	1,920	−−		1953	429	−−
1916	4,080	−−		1954	624	−−
1917	2,600	−−		1955	958	−−
Gap in systematic record				1956	1,840	−−
1919	5,040	−−		1957	1,630	−−
1920	1,780	−−		1958	828	−−
1921	1,700	−−		1959	950	−−
1922	2,680	−−		1960	1,100	−−
1923	1,160	−−		1961	441	−−
1924	145	−−		1962	2,800	−−
1925	1,420	−−		1963	2,180	−−
1926	1,660	−−		1964	2,480	−−
Gap in systematic record				1965	4,110	−−
1929	1,870	−−		1966	3,320	−−
1930	776	−−		1967	3,100	−−
1931	39	∗		1968	1,950	−−
1932	1,340	−−		1969	3,190	−−
1933	470	−−		1970	2,820	−−
1934	150	−−		1971	1,780	−−
1935	318	−−		1972	2,340	−−
1936	890	−−		1973	871	−−
1937	1,060	−−		1974	3,160	−−
1938	1,130	−−		1975	3,260	−−
1939	35	∗		1976	1,350	−−
1940	728	−−		1977	403	−−
1941	822	−−		1978	2,740	−−
1942	1,480	−−		1979	3,590	−−
1943	1,060	−−		1980	1,710	−−
1944	666	−−		1981	620	−−
1945	1,650	−−		1982	2,130	−−
1946	1,170	−−		1983	1,500	−−

Water year	Peak flow	Peak-flow code
1984	1,520	––
1985	2,130	––
1986	2,420	––
1987	1,570	––
1988	1,170	––
1989	2,300	––
1990	150	––
1991	314	––
1992	1,220	––
1993	2,180	––
1994	1,960	––
1995	2,080	––
1996	3,350	––
1997	4,120	––
1998	1,770	––
1999	3,900	––
2000	1,670	––
2001	3,400	––
2002	3,410	––
2003	908	––
2004	2,930	––
2005	2,610	––
2006	3,170	––
2007	1,210	––
2008	1,230	––
2009	3,000	––
2010	3,250	––
2011	4,640	––