

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05129000 Vermilion River below Vermilion Lake near Tower, Minn.

**Peak-flow information:**

Number of systematic peak flows in record	59
Systematic period begins	1912
Systematic period ends	1981
Length of systematic record	70
Years without information	11
Number of historical peak flows in record	0

**Frequency analysis options:**

Method	Bulletin 17B
Skew option	Weighted
Generalized skew	0.039
Standard error of generalized skew	0.426
Low-outlier method	Bulletin 17B Grubbs-Beck test

**Bulletin 17B systematic record analysis results:**

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

	Standard	
Mean	deviation	Skewness
3.0227	0.1977	-0.389

**Outlier criteria and number of peak flows exceeding:**

Low	290.5	0
High	3822.8	0

**Bulletin 17B Final analysis results:**

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

	Standard	
Mean	deviation	Skewness
3.0227	0.1977	-0.224

**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	296	230	359	--	--	--
0.9900	339	270	404	--	--	--
0.9500	485	407	556	--	--	--
0.9000	582	501	657	--	--	--
0.8000	723	638	803	--	--	--
0.6667	879	790	969	--	--	--
0.5000	1,070	972	1,180	1,080	955	1,210
0.4292	1,160	1,050	1,290	--	--	--
0.2000	1,550	1,400	1,760	1,560	1,370	1,760
0.1000	1,870	1,660	2,160	1,870	1,630	2,160
0.0400	2,260	1,970	2,680	2,260	1,900	2,690
0.0200	2,540	2,190	3,070	2,550	2,080	3,120
0.0100	2,820	2,400	3,460	2,830	2,230	3,580
0.0050	3,090	2,610	3,860	--	--	--
0.0020	3,450	2,880	4,380	3,470	2,520	4,760

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

Explanation of symbols and codes

-- none

Water	Peak	Peak-flow	Water	Peak	Peak-flow
year	flow	code	year	flow	code
1912	595	--	1952	727	--
1913	1,810	--	1953	972	--
1914	1,110	--	1954	1,840	--
1915	930	--	1955	537	--
1916	2,050	--	1956	1,310	--
1917	397	--	1957	1,080	--
Gap in systematic record			1958	418	--
1929	763	--	1959	657	--
1930	788	--	1960	1,030	--
1931	1,100	--	1961	1,160	--
1932	734	--	1962	1,420	--
1933	658	--	1963	734	--
1934	820	--	1964	1,080	--
1935	900	--	1965	1,420	--
1936	1,160	--	1966	1,920	--
1937	1,440	--	1967	850	--
1938	2,290	--	1968	1,420	--
1939	841	--	1969	1,540	--
1940	873	--	1970	1,730	--
1941	1,170	--	1971	1,350	--
1942	1,020	--	1972	1,250	--
1943	1,460	--	1973	722	--
1944	1,980	--	1974	1,480	--
1945	1,380	--	1975	1,600	--
1946	808	--	1976	735	--
1947	1,480	--	1977	302	--
1948	2,090	--	1978	1,080	--
1949	616	--	1979	1,450	--
1950	2,710	--	1980	494	--
1951	1,100	--	1981	1,060	--