

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05139500 Warroad River near Warroad, Minn.

**Peak-flow information:**

Number of systematic peak flows in record	35
Systematic period begins	1946
Systematic period ends	1980
Length of systematic record	35
Years without information	0
Number of historical peak flows in record	0

**Frequency analysis options:**

Method	Bulletin 17B
Skew option	Weighted
Generalized skew	-0.481
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
2.7468	0.3815	-0.522

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

Low	55.5	0
High	5616.6	0

**Bulletin 17B Final analysis results:**

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

	Standard	
Mean	deviation	Skewness
2.7468	0.3815	-0.501

**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	38.6	18.8	63.5	--	--	--
0.9900	52.7	27.6	82.9	--	--	--
0.9500	117.0	73.2	166.0	--	--	--
0.9000	175.0	118.0	235.0	--	--	--
0.8000	274.0	200.0	356.0	--	--	--
0.6667	408.0	311.0	521.0	--	--	--
0.5000	601.0	469.0	773.0	619	473	810
0.4292	700.0	548.0	910.0	--	--	--
0.2000	1,180.0	911.0	1,640.0	1,250	958	1,620
0.1000	1,620.0	1,220.0	2,370.0	1,730	1,300	2,300
0.0400	2,210.0	1,600.0	3,420.0	2,410	1,720	3,380
0.0200	2,660.0	1,880.0	4,270.0	2,960	2,020	4,360
0.0100	3,110.0	2,160.0	5,160.0	3,560	2,300	5,500
0.0050	3,560.0	2,430.0	6,070.0	--	--	--
0.0020	4,140.0	2,770.0	7,320.0	5,050	2,890	8,810

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

Explanation of symbols and codes

-- none

Water	Peak	Peak-flow
year	flow	code
1946	492	--
1947	1,410	--
1948	1,210	--
1949	408	--
1950	1,170	--
1951	776	--
1952	473	--
1953	138	--
1954	427	--
1955	185	--
1956	1,060	--
1957	333	--
1958	123	--
1959	331	--
1960	230	--
1961	93	--
1962	1,460	--
1963	507	--
1964	851	--
1965	1,780	--
1966	1,020	--
1967	1,550	--
1968	1,530	--
1969	1,140	--
1970	1,040	--
1971	499	--
1972	732	--
1973	156	--
1974	756	--
1975	1,030	--
1976	304	--
1977	106	--
1978	979	--
1979	2,070	--
1980	300	--