

Annual Peak-Flow Frequency Analysis

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

Streamgauge number and name:

05318300 Watonwan River near Delft, Minn.

Peak-flow information:

Number of systematic peak flows in record	44
Systematic period begins	1960
Systematic period ends	2003
Length of systematic record	44
Years without information	0
Number of historical peak flows in record	0

Frequency analysis options:

Method	Bulletin 17B
Skew option	Weighted
Generalized skew	-0.165
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
	2.0327	0.5704	0.264

Outlier criteria and number of peak flows exceeding:

Low	3.0	0
High	3834.4	0

Bulletin 17B Final analysis results:

Moments of the common logarithms of the peak flows:

	Standard		
Mean	deviation	Skewness	
2.0327	0.5704	0.081	

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	4.0	1.8	7.2	--	--	--
0.9900	5.5	2.6	9.4	--	--	--
0.9500	12.8	7.2	19.9	--	--	--
0.9000	20.3	12.2	30.1	--	--	--
0.8000	35.5	23.2	50.5	--	--	--
0.6667	60.4	41.8	83.9	--	--	--
0.5000	106.0	76.0	147.0	113	77.9	164
0.4292	134.0	96.7	188.0	--	--	--
0.2000	324.0	228.0	495.0	327	219.0	489
0.1000	587.0	394.0	976.0	556	354.0	872
0.0400	1,110.0	700.0	2,060.0	936	553.0	1,580
0.0200	1,690.0	1,010.0	3,390.0	1,280	709.0	2,330
0.0100	2,470.0	1,410.0	5,310.0	1,680	871.0	3,220
0.0050	3,510.0	1,920.0	8,060.0	--	--	--
0.0020	5,380.0	2,770.0	13,400.0	2,780	1,240.0	6,220

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
1960	549.0	--	1982	20.0	--
1961	32.0	--	1983	370.0	--
1962	108.0	--	1984	108.0	--
1963	345.0	--	1985	42.0	--
1964	27.0	--	1986	340.0	--
1965	810.0	--	1987	53.0	--
1966	61.0	--	1988	21.0	--
1967	55.0	--	1989	34.0	--
1968	565.0	--	1990	19.0	--
1969	865.0	--	1991	665.0	--
1970	92.0	--	1992	660.0	--
1971	177.0	--	1993	1,000.0	--
1972	34.0	--	1994	72.0	--
1973	18.0	--	1995	175.0	--
1974	39.0	--	1996	320.0	--
1975	54.0	--	1997	840.0	--
1976	45.0	--	1998	100.0	--
1977	41.0	--	1999	44.0	--
1978	91.0	--	2000	63.0	--
1979	215.0	--	2001	322.0	--
1980	900.0	--	2002	37.0	--
1981	8.7	--	2003	49.0	--