

Annual Peak-Flow Frequency Analysis

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

Streamgage number and name:

05051500 Red River of the North at Wahpeton, N. Dak.

Peak-flow information:

Number of systematic peak flows in record	70
Systematic period begins	1897
Systematic period ends	2011
Length of systematic record	115
Years without information	45
Number of historical peak flows in record	1 1897

Frequency analysis options:

Method	Expected moments algorithm (EMA)
Skew option	Streamgage
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	
3.4838	0.3334	-0.630	

Low-outlier information:

Number of low outliers	0
Low-outlier threshold	512

Final analysis results:

Moments of the common logarithms of the peak flows:

	Standard	
Mean	deviation	Skewness
3.4838	0.3334	-0.630

Annual frequency curve at selected exceedance probabilities:

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	269	46.6	476
0.9900	362	82.2	590
0.9500	763	368.0	1,050
0.9000	1,100	686.0	1,430
0.8000	1,650	1,230.0	2,070
0.6667	2,350	1,870.0	2,900
0.5000	3,300	2,700.0	4,070
0.4292	3,770	3,110.0	4,620
0.2000	5,880	4,930.0	6,930
0.1000	7,630	6,430.0	8,940
0.0400	9,760	8,260.0	12,100
0.0200	11,300	9,230.0	14,700
0.0100	12,700	9,820.0	17,500
0.0050	14,000	10,200.0	20,400
0.0020	15,700	10,400.0	24,900

Peak-flow data used in the analysis:

Explanation of symbols and codes

H Historic, outside of systematic record

K Peak affected by regulation

Water	Peak	Peak-flow	Water	Peak	Peak-flow
year	flow	code	year	flow	code
1897	10,500	H	1976	2,700	K
Gap in systematic record			1977	526	K
1942	3,280	K	1978	6,250	K
1943	5,000	K	1979	7,050	K
1944	4,360	K	1980	3,100	K
1945	3,910	K	1981	512	K
1946	3,110	K	1982	3,120	K
1947	4,610	K	1983	880	K
1948	2,300	K	1984	4,710	K
1949	2,290	K	1985	3,690	K
1950	4,190	K	1986	6,140	K
1951	6,090	K	1987	1,770	K
1952	7,130	K	1988	911	K
1953	3,150	K	1989	8,370	K
1954	1,860	K	1990	900	K
1955	1,150	K	1991	2,980	K
1956	1,980	K	1992	2,000	K
1957	2,290	K	1993	6,080	K
1958	866	K	1994	5,000	K
1959	1,050	K	1995	6,370	K
1960	2,370	K	1996	5,400	K
1961	548	K	1997	12,800	K
1962	5,650	K	1998	4,250	K
1963	3,830	K	1999	4,220	K
1964	1,700	K	2000	2,630	K
1965	5,690	K	2001	9,340	K
1966	4,760	K	2002	3,350	K
1967	2,500	K	2003	3,800	K
1968	708	K	2004	3,160	K
1969	9,200	K	2005	5,410	K
1970	1,450	K	2006	7,180	K
1971	927	K	2007	7,080	K
1972	3,380	K	2008	3,190	K
1973	1,220	K	2009	10,400	K
1974	1,250	K	2010	6,400	K
1975	3,850	K	2011	7,490	K