

Annual Peak-Flow Frequency Analysis

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

Streamgage number and name:

05054000 Red River of the North at Fargo, N. Dak.

Peak-flow information:

Number of systematic peak flows in record	110
Systematic period begins	1902
Systematic period ends	2011
Length of systematic record	110
Years without information	0
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	
3.5795	0.4536	-0.085	

Low-outlier information:

Number of low outliers	0
Low-outlier threshold	323

Final analysis results:

Moments of the common logarithms of the peak flows:

	Standard	
Mean	deviation	Skewness
3.5795	0.4536	-0.085

Annual frequency curve at selected exceedance probabilities:

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	237	89	387
0.9900	313	139	478
0.9500	665	419	890
0.9000	987	704	1,270
0.8000	1,580	1,230	1,980
0.6667	2,450	1,960	3,030
0.5000	3,850	3,110	4,770
0.4292	4,640	3,760	5,750
0.2000	9,180	7,400	11,600
0.1000	14,300	11,300	19,300
0.0400	22,900	17,300	35,000
0.0200	30,900	22,200	53,000
0.0100	40,400	27,400	77,900
0.0050	51,500	32,800	112,000
0.0020	68,900	40,100	177,000

Peak-flow data used in the analysis:

Explanation of symbols and codes

-- none

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	25,000	H	1936	1,050	--
			1937	1,390	--
1902	1,180	--	1938	1,350	--
1903	2,450	--	1939	3,870	--
1904	5,220	--	1940	1,030	--
1905	4,250	--	1941	1,390	--
1906	3,050	--	1942	3,380	K
1907	7,000	--	1943	16,000	K
1908	2,600	--	1944	4,150	K
1909	1,780	--	1945	7,700	K
1910	5,000	--	1946	5,970	K
1911	608	--	1947	9,300	K
1912	1,100	--	1948	3,390	K
1913	1,560	--	1949	2,660	K
1914	3,140	--	1950	7,800	K
1915	3,130	--	1951	8,010	K
1916	7,740	--	1952	16,300	K
1917	5,240	--	1953	6,720	K
1918	874	--	1954	1,920	K
1919	680	--	1955	2,760	K
1920	6,200	--	1956	3,870	K
1921	1,970	--	1957	2,540	K
1922	5,200	--	1958	2,280	K
1923	3,960	--	1959	1,250	K
1924	530	--	1960	3,900	K
1925	940	--	1961	1,020	K
1926	1,600	--	1962	9,580	K
1927	2,650	--	1963	4,930	K
1928	3,840	--	1964	2,400	K
1929	4,440	--	1965	11,400	K
1930	1,340	--	1966	10,700	K
1931	365	--	1967	5,900	K
1932	875	--	1968	788	K
1933	605	--	1969	25,300	K
1934	323	--	1970	2,480	K
1935	942	--	1971	1,910	K

Water year	Peak flow	Peak-flow code
1972	7,250	K
1973	1,950	K
1974	4,150	K
1975	13,200	K
1976	3,200	K
1977	878	K
1978	17,500	K
1979	17,300	K
1980	5,470	K
1981	1,710	K
1982	5,920	K
1983	1,750	K
1984	9,550	K
1985	4,690	K
1986	8,640	K
1987	3,300	K
1988	981	K
1989	18,900	K
1990	1,220	K
1991	2,630	K
1992	2,590	K
1993	10,100	K
1994	11,200	K
1995	11,000	K
1996	9,940	K
1997	28,000	K
1998	8,610	K
1999	4,900	K
2000	5,630	K
2001	20,300	K
2002	4,250	K
2003	6,710	K
2004	5,430	K
2005	9,810	K
2006	19,900	K
2007	13,500	K

Water year	Peak flow	Peak-flow code
2008	4,840	K
2009	29,500	K
2010	21,200	K
2011	27,200	K