

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05092000 Red River of the North at Drayton, N. Dak.

**Peak-flow information:**

Number of systematic peak flows in record	73
Systematic period begins	1936
Systematic period ends	2011
Length of systematic record	76
Years without information	3
Peak flows not used in analysis	1
Number of historical peak flows in record	1 1897

**Frequency analysis options:**

Method	Expected moments algorithm (EMA)
Skew option	STATION SKEW
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	
4.3992	0.3376	-0.505	

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

Low	2615.2	0
High	240414.7	0

**Expected moments algorithm (EMA) Final analysis results:**

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

	Standard	
Mean	deviation	Skewness
4.3356	0.3315	-0.508

**Annual frequency curve at selected exceedance probabilities:**

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	2,120	428	3,580
0.9900	2,780	722	4,370
0.9500	5,580	2,790	7,520
0.9000	7,890	4,990	10,000
0.8000	11,700	8,800	14,200
0.6667	16,500	13,400	19,600
0.5000	23,100	19,300	27,200
0.4292	26,400	22,200	30,900
0.2000	41,600	35,600	48,300
0.1000	54,800	47,100	64,900
0.0400	71,500	60,600	90,800
0.0200	83,800	68,600	112,000
0.0100	95,900	74,600	136,000
0.0050	108,000	79,200	163,000
0.0020	123,000	83,700	204,000

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

Explanation of symbols and codes

- none
- NA Missing peak value
- H Historic, outside of systematic record
- K Peak affected by regulation

Water year	Peak flow	Peak-flow code	Water year	Peak flow	Peak-flow code
1897	NA	H	1971	23,400	K
			1972	31,100	K
1936	16,600	--	1973	13,400	K
1937	4,530	--	1974	43,900	K
Gap in systematic record			1975	44,000	K
1941	22,800	--	1976	27,600	K
1942	21,900	K	1977	3,400	K
1943	28,700	K	1978	56,200	K
1944	12,300	K	1979	92,900	K
1945	24,600	K	1980	22,400	K
1946	23,000	K	1981	7,520	K
1947	29,300	K	1982	35,500	K
1948	57,000	K	1983	21,300	K
1949	27,900	K	1984	32,400	K
1950	86,500	K	1985	17,700	K
1951	24,600	K	1986	29,700	K
1952	23,900	K	1987	27,600	K
1953	14,700	K	1988	13,900	K
1954	11,100	K	1989	41,800	K
1955	18,000	K	1990	5,080	K
1956	28,000	K	1991	4,940	K
1957	14,100	K	1992	8,800	K
1958	7,850	K	1993	27,600	K
1959	11,200	K	1994	27,900	K
1960	24,700	K	1995	37,800	K
1961	3,600	K	1996	61,300	K
1962	32,300	K	1997	124,000	K
1963	12,900	K	1998	28,400	K
1964	15,600	K	1999	59,500	K
1965	47,200	K	2000	29,300	K
1966	67,500	K	2001	55,300	K
1967	32,200	K	2002	34,800	K
1968	12,500	K	2003	15,300	K
1969	59,000	K	2004	37,400	K
1970	31,700	K	2005	31,200	K

Water year	Peak flow	Peak-flow code
2006	78,800	K
2007	30,400	K
2008	18,600	K
2009	85,500	K
2010	65,700	K
2011	83,000	K