

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05064500 Red River of the North at Halstad, Minn.

**Peak-flow information:**

Number of systematic peak flows in record	72
Systematic period begins	1936
Systematic period ends	2011
Length of systematic record	76
Years without information	4
Number of historical peak flows in record	0

**Frequency analysis options:**

Method	Bulletin 17B
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	
4.1038	0.3700	-0.242	

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

Low	1071.0	0
High	150604.3	0

**Bulletin 17B Final analysis results:**

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

	Standard	
Mean	deviation	Skewness
4.1038	0.3700	-0.242

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

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	1,170	765	1,620
0.9900	1,510	1,020	2,040
0.9500	2,960	2,210	3,740
0.9000	4,180	3,250	5,140
0.8000	6,280	5,100	7,520
0.6667	9,060	7,570	10,700
0.5000	13,100	11,100	15,500
0.4292	15,300	13,000	18,200
0.2000	26,200	21,900	32,300
0.1000	36,900	30,100	47,200
0.0400	52,400	41,600	69,900
0.0200	65,300	50,700	89,600
0.0100	79,100	60,300	111,000
0.0050	93,900	70,400	135,000
0.0020	115,000	84,400	171,000

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

Explanation of symbols and codes

-- none

K Peak affected by regulation

Water	Peak	Peak-flow	Water	Peak	Peak-flow
year	flow	code	year	flow	code
1936	7,670	--	1976	9,950	K
1937	2,660	--	1977	2,050	K
Gap in systematic record			1978	28,800	K
1942	5,060	K	1979	42,000	K
1943	21,800	K	1980	12,900	K
1944	7,200	K	1981	3,920	K
1945	13,300	K	1982	13,200	K
1946	10,000	K	1983	7,800	K
1947	24,500	K	1984	21,900	K
1948	16,000	K	1985	10,400	K
1949	7,710	K	1986	17,400	K
1950	18,700	K	1987	9,860	K
1951	12,900	K	1988	5,010	K
1952	20,700	K	1989	26,000	K
1953	13,600	K	1990	2,880	K
1954	4,660	K	1991	3,700	K
1955	7,200	K	1992	5,200	K
1956	12,900	K	1993	22,500	K
1957	4,980	K	1994	16,600	K
1958	4,420	K	1995	23,300	K
1959	3,780	K	1996	25,200	K
1960	8,600	K	1997	71,500	K
1961	1,900	K	1998	19,200	K
1962	15,900	K	1999	18,100	K
1963	5,850	K	2000	29,100	K
1964	7,820	K	2001	37,900	K
1965	25,600	K	2002	15,000	K
1966	26,800	K	2003	11,900	K
1967	13,800	K	2004	18,200	K
1968	2,350	K	2005	21,300	K
1969	35,700	K	2006	43,100	K
1970	11,600	K	2007	24,700	K
1971	5,480	K	2008	15,300	K
1972	16,200	K	2009	67,400	K
1973	6,200	K	2010	43,600	K
1974	17,800	K	2011	60,700	K
1975	39,900	K			