

Annual Peak-Flow Frequency Analysis

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

**Streamgage number and name:**

05325000 Minnesota River at Mankato, Minn.

**Peak-flow information:**

Number of systematic peak flows in record	109
Systematic period begins	1903
Systematic period ends	2011
Length of systematic record	109
Years without information	0
Number of historical peak flows in record	0

**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	
4.2169	0.3749	-0.669	

**Low-outlier information:**

Number of low outliers	1
Low-outlier threshold	1,350

**Final analysis results:**

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

	Standard	
Mean	deviation	Skewness
4.2169	0.3749	-0.669

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

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	1,050	229	1,830
0.9900	1,470	435	2,370
0.9500	3,450	1,910	4,690
0.9000	5,220	3,530	6,690
0.8000	8,310	6,430	10,200
0.6667	12,400	10,100	15,000
0.5000	18,100	15,100	21,800
0.4292	21,000	17,600	25,100
0.2000	34,500	29,400	40,400
0.1000	46,000	39,400	55,100
0.0400	60,200	49,900	76,600
0.0200	70,300	54,900	94,100
0.0100	79,900	58,000	113,000
0.0050	89,000	60,100	134,000
0.0020	100,000	61,800	165,000

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

Explanation of symbols and codes

-- none

\* Less than low-outlier threshold

Water	Peak	Peak-flow	Water	Peak	Peak-flow
year	flow	code	year	flow	code
1903	43,500	--	1940	3,930	--
1904	20,500	--	1941	11,400	--
1905	18,600	--	1942	7,280	--
1906	9,940	--	1943	19,800	--
1907	22,100	--	1944	25,100	--
1908	54,500	--	1945	18,000	--
1909	31,700	--	1946	13,300	--
1910	20,700	--	1947	20,400	--
1911	905	*	1948	17,900	--
1912	8,530	--	1949	26,600	--
1913	5,460	--	1950	12,200	--
1914	11,000	--	1951	66,600	--
1915	23,100	--	1952	53,500	--
1916	30,500	--	1953	25,100	--
1917	26,900	--	1954	10,000	--
1918	15,000	--	1955	8,200	--
1919	38,800	--	1956	11,600	--
1920	19,600	--	1957	41,700	--
1921	4,910	--	1958	7,570	--
1922	9,040	--	1959	4,850	--
1923	1,630	--	1960	34,300	--
1924	3,540	--	1961	17,600	--
1925	8,640	--	1962	39,800	--
1926	4,990	--	1963	15,600	--
1927	12,100	--	1964	12,400	--
1928	11,400	--	1965	94,100	--
1929	23,200	--	1966	15,400	--
1930	9,260	--	1967	18,700	--
1931	1,350	--	1968	15,800	--
1932	7,400	--	1969	76,700	--
1933	13,400	--	1970	8,680	--
1934	2,170	--	1971	21,400	--
1935	5,100	--	1972	20,200	--
1936	25,100	--	1973	19,700	--
1937	8,400	--	1974	12,500	--
1938	11,200	--	1975	24,100	--
1939	9,350	--	1976	5,130	--

Water year	Peak flow	Peak-flow code
1977	7,850	--
1978	13,300	--
1979	30,000	--
1980	15,700	--
1981	14,200	--
1982	15,500	--
1983	33,300	--
1984	41,000	--
1985	29,700	--
1986	36,300	--
1987	8,170	--
1988	5,520	--
1989	15,800	--
1990	17,100	--
1991	33,100	--
1992	23,900	--
1993	75,600	--
1994	21,800	--
1995	27,600	--
1996	28,000	--
1997	79,800	--
1998	28,400	--
1999	24,200	--
2000	16,900	--
2001	73,700	--
2002	13,000	--
2003	15,000	--
2004	23,700	--
2005	23,900	--
2006	33,900	--
2007	28,700	--
2008	21,700	--
2009	19,000	--
2010	84,600	--
2011	64,900	--