Annual Peak-Flow Frequency Analysis
For more information on the contents of this documentation, see Kessler and others (2013).

Streamgage number and name:
05317000 Cottonwood River near New Ulm, Minn.

Peak-flow information:

Number of systematic peak flows in record	84
Systematic period begins	1910
Systematic period ends	2011
Length of systematic record	102
Years without information	18
Peak flows not used in analysis	1
Number of historical peak flows in record	0

Frequency analysis options:

Method	Expected moments algorithm (EMA)
Skew option	Weighted
Generalized skew	-0.123
Standard error of generalized skew	0.426
Low-outlier method	Bulletin 17B Grubbs-Beck test

Bulletin 17B systematic record analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
3.5367	0.4413	-0.524

Outlier criteria and number of peak flows exceeding:

Low	170.6	2
High	52199.5	0

Expected moments algorithm (EMA) Final analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
3.5428	0.4238	-0.219

Annual frequency curve at selected exceedance probabilities:

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	NA	NA	NA
0.9900	NA	NA	NA
0.9500	661	394	913
0.9000	979	664	1,290
0.8000	1,550	1,160	1,980
0.6667	2,360	1,850	2,960
0.5000	3,620	2,880	4,520
0.4292	4,300	3,440	5,370
0.2000	8,000	6,400	10,200
0.1000	11,900	9,350	16,000
0.0400	17,900	13,500	26,800
0.0200	23,000	16,700	38,000
0.0100	28,800	19,900	52,300
0.0050	35,200	23,000	70,600
0.0020	44,700	27,000	102,000

Peak-flow data used in the analysis:

Explanation of symbols and codes

−−	none
D	Peak result of dam break
∗	Less than low-outlier threshold

Water year	Peak flow	Peak-flow code	Water year	Peak flow	Peak-flow code
1910	3,250	−−	1962	14,200	−−
1911	391	−−	1963	3,220	−−
1912	692	−−	1964	969	−−
1913	1,010	−−	1965	26,000	−−
Gap in systematic record			1966	2,190	−−
1931	141	∗	1967	2,890	−−
1932	4,580	−−	1968	4,550	−−
1933	2,010	−−	1969	28,700	−−
1934	146	∗	1970	2,110	−−
1935	680	−−	1971	7,460	−−
1936	4,160	−−	1972	3,160	−−
1937	3,540	−−	1973	2,680	−−
1938	4,380	−−	1974	738	−−
1939	1,440	−−	1975	3,260	−−
1940	1,900	−−	1976	1,430	−−
1941	3,400	−−	1977	2,900	−−
1942	3,050	−−	1978	2,770	−−
1943	4,670	−−	1979	5,970	−−
1944	7,310	−−	1980	4,000	−−
1945	3,020	−−	1981	796	−−
1946	2,060	−−	1982	1,990	−−
1947	13,800	D	1983	12,500	−−
1948	6,140	−−	1984	11,000	−−
1949	7,000	−−	1985	6,650	−−
1950	3,320	−−	1986	10,100	−−
1951	11,500	−−	1987	2,920	−−
1952	10,500	−−	1988	1,020	−−
1953	3,750	−−	1989	4,190	−−
1954	2,950	−−	1990	2,630	−−
1955	1,330	−−	1991	5,440	−−
1956	2,210	−−	1992	3,820	−−
1957	5,380	−−	1993	24,300	−−
1958	2,760	−−	1994	4,750	−−
1959	1,480	−−	1995	4,770	−−
1960	5,920	−−	1996	6,580	−−
1961	1,300	−−	1997	13,800	−−

Water year	Peak flow	Peak-flow code
1998	6,000	––
1999	2,900	––
2000	2,280	––
2001	20,200	––
2002	5,390	––
2003	1,420	––
2004	6,410	––
2005	2,840	––
2006	6,050	––
2007	8,850	––
2008	2,940	––
2009	1,330	––
2010	19,600	––
2011	15,100	––