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

Streamgage number and name:

05316950 Cottonwood River near Springfield, Minn.

Peak-flow information:

Number of systematic peak flows in record	39	
Systematic period begins	1973	
Systematic period ends	2011	
Length of systematic record	39	
Years without information	0	
Number of historical peak flows in record	1	1969
Length of historical period	43	
Historical period begins	1969	
Historical period ends	2011	
Historical period based on		Date of historical peak

Frequency analysis options:

Method	Expected moments algorithm (EMA)
Skew option	Weighted
Generalized skew	-0.161
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
3.4709	0.3621	-0.067

Outlier criteria and number of peak flows exceeding:

Low	318.9	0
High	18300.0	0

Expected moments algorithm (EMA) Final analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
3.4894	0.3771	-0.061

Annual frequency curve at selected exceedance probabilities:

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	314	86.2	547
0.9900	394	132.0	646
0.9500	729	377.0	1,060
0.9000	1,010	611.0	1,410
0.8000	1,490	1,020.0	2,020
0.6667	2,140	1,840.0	2,150
0.5000	3,110	2,320.0	4,160
0.4292	3,630	2,720.0	4,880
0.2000	6,420	4,780.0	9,100
0.1000	9,340	6,770.0	14,500
0.0400	13,800	9,600.0	25,500
0.0200	17,800	11,800.0	38,100
0.0100	22,400	14,100.0	55,900
0.0050	27,500	16,400.0	80,700
0.0020	35,200	19,400.0	128,000

Peak-flow data used in the analysis:

Explanation of symbols and codes

−− none

H Historic, outside of systematic record

Water year	Peak flow	Peak-flow code	Water year	Peak flow	Peak-flow code
1969	18,300	H	1992	2,450	−−
			1993	14,500	−−
1973	1,940	−−	1994	3,400	−−
1974	520	−−	1995	3,400	−−
1975	3,050	−−	1996	4,600	−−
1976	1,320	−−	1997	7,860	−−
1977	2,260	−−	1998	3,560	−−
1978	1,920	−−	1999	2,080	−−
1979	6,420	−−	2000	1,340	−−
1980	3,160	−−	2001	8,650	−−
1981	560	−−	2002	1,400	−−
1982	1,400	−−	2003	1,100	−−
1983	7,900	−−	2004	4,060	−−
1984	8,500	−−	2005	1,500	−−
1985	5,500	−−	2006	4,140	−−
1986	8,200	−−	2007	5,530	−−
1987	2,250	−−	2008	1,630	−−
1988	1,800	−−	2009	900	−−
1989	4,020	−−	2010	12,100	−−
1990	1,070	−−	2011	9,480	−−
1991	3,400	−−			