

## Annual Peak-Flow Frequency Analysis

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

### Streamgauge number and name:

05315000 Redwood River near Marshall, Minn.

### Peak-flow information:

Number of systematic peak flows in record	72
Systematic period begins	1940
Systematic period ends	2011
Length of systematic record	72
Years without information	0
Number of historical peak flows in record	0

### Frequency analysis options:

Method	Expected moments algorithm (EMA)
Skew option	Weighted
Generalized skew	-0.24
Standard error of generalized skew	0.4266
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
2.8560	0.4841	-0.436

#### Low-outlier information:

Number of low outliers	1
Low-outlier threshold	47

**Final analysis results:**

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

	Standard	
Mean	deviation	Skewness
2.8562	0.4835	-0.361

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

[WIE, Weighted independent estimate; --, not computed]

Exceedance probability	Peak estimate	Lower-95 level	Upper 95 level	WIE estimate	Lower-95 WIE level	Upper 95 WIE level
0.9950	28.0	6.1	55.3	--	--	--
0.9900	40.3	11.3	72.9	--	--	--
0.9500	103.0	50.0	157.0	--	--	--
0.9000	166.0	97.7	237.0	--	--	--
0.8000	288.0	196.0	391.0	--	--	--
0.6667	471.0	344.0	624.0	--	--	--
0.5000	768.0	579.0	1,010.0	766	590	994
0.4292	933.0	709.0	1,220.0	--	--	--
0.2000	1,860.0	1,420.0	2,480.0	1,840	1,420	2,370
0.1000	2,850.0	2,150.0	4,030.0	2,800	2,110	3,700
0.0400	4,360.0	3,170.0	6,940.0	4,250	3,040	5,950
0.0200	5,670.0	3,930.0	9,960.0	5,500	3,720	8,130
0.0100	7,100.0	4,650.0	13,900.0	6,870	4,390	10,700
0.0050	8,670.0	5,310.0	18,800.0	--	--	--
0.0020	10,900.0	6,110.0	27,500.0	10,500	5,850	18,900

### 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
1940	1,040	--	1976	400	--
1941	382	--	1977	1,360	--
1942	437	--	1978	1,060	--
1943	891	--	1979	1,800	--
1944	1,640	--	1980	382	--
1945	320	--	1981	53	--
1946	623	--	1982	301	--
1947	1,800	--	1983	3,270	--
1948	1,250	--	1984	1,850	--
1949	1,080	--	1985	1,540	--
1950	578	--	1986	2,350	--
1951	2,740	--	1987	954	--
1952	1,800	--	1988	219	--
1953	628	--	1989	608	--
1954	890	--	1990	731	--
1955	162	--	1991	468	--
1956	47	--	1992	400	--
1957	5,370	--	1993	6,380	--
1958	388	--	1994	1,490	--
1959	24	*	1995	1,390	--
1960	1,410	--	1996	542	--
1961	190	--	1997	3,310	--
1962	1,270	--	1998	590	--
1963	677	--	1999	855	--
1964	138	--	2000	440	--
1965	2,220	--	2001	3,930	--
1966	445	--	2002	392	--
1967	373	--	2003	532	--
1968	162	--	2004	1,660	--
1969	5,590	--	2005	177	--
1970	485	--	2006	933	--
1971	523	--	2007	1,940	--
1972	668	--	2008	551	--
1973	1,040	--	2009	243	--
1974	144	--	2010	4,580	--
1975	204	--	2011	2,720	--