

## Annual Peak-Flow Frequency Analysis

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

### Streamgauge number and name:

04021690 Cloquet River near Toimi, Minn.

### Peak-flow information:

Number of systematic peak flows in record	26
Systematic period begins	1986
Systematic period ends	2011
Length of systematic record	26
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	0.21
Standard error of generalized skew	0.4266
Low-outlier method	Multiple Grubbs-Beck test

### EMA systematic record analysis results:

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

	Standard	
Mean	deviation	Skewness
2.6376	0.2239	0.035

### Low-outlier information:

Number of low outliers	0
Low-outlier threshold	Not determined

**Final analysis results:**

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

	Standard	
Mean	deviation	Skewness
2.6383	0.2222	0.149

**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	125	56.3	176	--	--	--
0.9900	140	70.5	190	--	--	--
0.9500	192	124.0	244	--	--	--
0.9000	228	163.0	284	--	--	--
0.8000	282	217.0	348	--	--	--
0.6667	345	275.0	425	--	--	--
0.5000	429	348.0	534	424	349	515
0.4292	471	382.0	590	--	--	--
0.2000	666	535.0	901	658	524	824
0.1000	844	663.0	1,270	832	638	1,090
0.0400	1,090	825.0	1,970	1,070	772	1,480
0.0200	1,290	944.0	2,740	1,260	864	1,830
0.0100	1,510	1,060.0	3,770	1,460	952	2,240
0.0050	1,740	1,180.0	5,160	--	--	--
0.0020	2,080	1,330.0	7,750	1,960	1,140	3,370

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

Explanation of symbols and codes

< Less than

-- none

Water	Peak	Peak-flow
year	flow	code
1986	362	--
1987	475	--
1988	500	--
1989	505	--
1990	570	--
1991	336	--
1992	550	--
1993	1,540	--
1994	550	--
1995	555	--
1996	650	--
1997	530	--
1998	260	--
1999	831	--
2000	293	--
2001	915	--
2002	360	--
2003	<190	--
2004	452	--
2005	297	--
2006	447	--
2007	321	--
2008	670	--
2009	301	--
2010	<176	--
2011	285	--