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

Streamgage number and name:

05129115 Vermilion River near Crane Lake, Minn.

Peak-flow information:

Number of systematic peak flows in record	33
Systematic period begins	1979
Systematic period ends	2011
Length of systematic record	33
Years without information	0
Number of historical peak flows in record	0

Frequency analysis options:

Method	Bulletin 17B
Skew option	Weighted
Generalized skew	-0.038
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
3.3489	0.1907	-0.667

Outlier criteria and number of peak flows exceeding:

Low	711.7	0
High	7005.8	0

Bulletin 17B Final analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
3.3489	0.1907	-0.328

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	630	441	804	––	––	––
0.9900	724	524	906	––	––	––
0.9500	1,040	820	1,240	––	––	––
0.9000	1,260	1,020	1,460	––	––	––
0.8000	1,560	1,320	1,780	––	––	––
0.6667	1,890	1,640	2,140	––	––	––
0.5000	2,290	2,010	2,600	2,300	1,980	2,680
0.4292	2,470	2,180	2,830	––	––	––
0.2000	3,250	2,840	3,840	3,260	2,790	3,810
0.1000	3,850	3,320	4,690	3,880	3,260	4,620
0.0400	4,570	3,860	5,770	4,620	3,750	5,690
0.0200	5,080	4,240	6,560	5,140	4,040	6,550
0.0100	5,570	4,590	7,340	5,660	4,290	7,460
0.0050	6,040	4,920	8,100	––	––	––
0.0020	6,640	5,340	9,110	6,790	4,710	9,790

Peak-flow data used in the analysis:

Explanation of symbols and codes

−− none

Water year	Peak flow	Peak-flow code
1979	4,600	−−
1980	1,650	−−
1981	2,390	−−
1982	3,100	−−
1983	1,730	−−
1984	2,090	−−
1985	4,360	−−
1986	2,740	−−
1987	1,600	−−
1988	3,040	−−
1989	2,780	−−
1990	2,530	−−
1991	1,780	−−
1992	1,870	−−
1993	1,960	−−
1994	2,320	−−
1995	968	−−
1996	3,100	−−
1997	2,640	−−
1998	1,000	−−
1999	2,710	−−
2000	1,190	−−
2001	3,700	−−
2002	1,320	−−
2003	726	−−
2004	2,390	−−
2005	2,710	−−
2006	2,230	−−
2007	1,790	−−
2008	3,620	−−
2009	2,930	−−
2010	2,490	−−
2011	4,190	−−