Annual Peak-Flow Frequency Analysis

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

Streamgage number and name:

05051522 Red River of the North at Hickson, N. Dak.

Peak-flow information:

Number of systematic peak flows in record	36
Systematic period begins	1976
Systematic period ends	2011
Length of systematic record	36
Years without information	0
Number of historical peak flows in record	0

Frequency analysis options:

Method	Expected moments algorithm (EMA)
Skew option	STATION SKEW
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
3.6374	0.4240	-0.715

Outlier criteria and number of peak flows exceeding:

Low	330.0	0
High	57050.1	0

Expected moments algorithm (EMA) Final analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
3.6374	0.4240	-0.715

Annual frequency curve at selected exceedance probabilities:

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	184	5.8	469
0.9900	273	14.7	611
0.9500	733	126.0	1,260
0.9000	1,180	350.0	1,860
0.8000	2,010	1,070.0	2,990
0.6667	3,160	2,030.0	4,640
0.5000	4,870	3,360.0	7,090
0.4292	5,750	4,030.0	8,260
0.2000	10,000	7,140.0	13,700
0.1000	13,700	10,100.0	20,700
0.0400	18,400	13,200.0	31,300
0.0200	21,800	13,900.0	40,000
0.0100	25,000	13,900.0	50,700
0.0050	28,000	13,900.0	64,100
0.0020	31,800	13,900.0	87,700

Peak-flow data used in the analysis:

Explanation of symbols and codes

K   Peak affected by regulation

Water year	Peak flow	Peak-flow code
1976	2,500	K
1977	408	K
1978	9,200	K
1979	9,600	K
1980	3,250	K
1981	544	K
1982	4,200	K
1983	824	K
1984	5,100	K
1985	3,680	K
1986	6,720	K
1987	2,460	K
1988	826	K
1989	12,900	K
1990	857	K
1991	2,820	K
1992	1,750	K
1993	6,400	K
1994	6,320	K
1995	8,000	K
1996	6,290	K
1997	13,300	K
1998	4,590	K
1999	3,700	K
2000	2,750	K
2001	11,500	K
2002	3,780	K
2003	4,390	K
2004	3,140	K
2005	7,090	K
2006	14,400	K
2007	9,410	K
2008	3,910	K
2009	23,700	K
2010	12,200	K
2011	13,900	K