Annual Peak-Flow Frequency Analysis

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

Streamgage number and name:

05305000 Chippewa River (TW) near Watson, Minn.

Peak-flow information:

Number of systematic peak flows in record	24
Systematic period begins	1911
Systematic period ends	2011
Length of systematic record	101
Years without information	77
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
2.9049	0.6339	-0.581

Outlier criteria and number of peak flows exceeding:

Low	21.9	1
High	20468.1	0

Expected moments algorithm (EMA) Final analysis results:

Moments of the common logarithms of the peak flows:

Mean	Standard deviation	Skewness
2.9182	0.6015	-0.325

Annual frequency curve at selected exceedance probabilities:

Exceedance probability	Peak estimate	Lower-95 level	Upper-95 level
0.9950	NA	NA	NA
0.9900	NA	NA	NA
0.9500	75.2	5.4	165
0.9000	135.0	19.8	273
0.8000	265.0	97.9	509
0.6667	486.0	233.0	916
0.5000	893.0	469.0	1,690
0.4292	1,140.0	610.0	2,160
0.2000	2,700.0	1,460.0	5,360
0.1000	4,620.0	2,480.0	12,600
0.0400	7,960.0	4,170.0	42,000
0.0200	11,100.0	5,330.0	83,200
0.0100	14,900.0	6,210.0	148,000
0.0050	19,200.0	6,810.0	256,000
0.0020	26,000.0	7,230.0	533,000

Peak-flow data used in the analysis:

Explanation of symbols and codes

−−	none
K	Peak affected by regulation
∗	Less than low-outlier threshold

Water year	Peak flow	Peak-flow code
1911	228	−−
1912	1,420	−−
1913	304	−−
1914	2,660	−−
1915	2,260	−−
1916	4,750	−−
1917	9,700	−−
Gap in systematic record		
1931	179	−−
1932	223	−−
1933	86	−−
1934	20	∗
1935	174	−−
1936	318	−−
Gap in systematic record		
2001	4,600	K
2002	627	K
2003	793	K
2004	793	K
2005	1,260	K
2006	1,040	K
2007	988	K
2008	820	K
2009	3,090	K
2010	2,850	K
2011	2,970	K