

Annual Peak-Flow Frequency Analysis

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

Streamgauge number and name:

05272950 Clearwater River near South Haven, Minn.

Peak-flow information:

| | |
|---|------|
| Number of systematic peak flows in record | 27 |
| Systematic period begins | 1985 |
| Systematic period ends | 2011 |
| Length of systematic record | 27 |
| 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 | -0.17 |
| 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 |
| 2.5048 | 0.3285 | -0.358 |

Low-outlier information:

| | |
|------------------------|-----|
| Number of low outliers | 3 |
| Low-outlier threshold | 131 |

Final analysis results:

Moments of the common logarithms of the peak flows:

| | Standard | |
|--------|-----------|----------|
| Mean | deviation | Skewness |
| 2.5064 | 0.3248 | -0.228 |

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 | 39.8 | 4.49 | 74.2 | -- | -- | -- |
| 0.9900 | 49.7 | 7.41 | 85.7 | -- | -- | -- |
| 0.9500 | 89.5 | 24.40 | 131.0 | -- | -- | -- |
| 0.9000 | 121.0 | 41.50 | 168.0 | -- | -- | -- |
| 0.8000 | 173.0 | 80.40 | 232.0 | -- | -- | -- |
| 0.6667 | 238.0 | 152.00 | 319.0 | -- | -- | -- |
| 0.5000 | 330.0 | 238.00 | 446.0 | 314 | 241 | 409 |
| 0.4292 | 377.0 | 276.00 | 513.0 | -- | -- | -- |
| 0.2000 | 606.0 | 449.00 | 885.0 | 572 | 431 | 759 |
| 0.1000 | 820.0 | 597.00 | 1,310.0 | 768 | 561 | 1,050 |
| 0.0400 | 1,120.0 | 787.00 | 2,090.0 | 1,030 | 710 | 1,500 |
| 0.0200 | 1,360.0 | 924.00 | 2,920.0 | 1,230 | 806 | 1,870 |
| 0.0100 | 1,610.0 | 1,050.00 | 4,030.0 | 1,440 | 897 | 2,310 |
| 0.0050 | 1,880.0 | 1,180.00 | 5,520.0 | -- | -- | -- |
| 0.0020 | 2,250.0 | 1,330.00 | 8,310.0 | 1,950 | 1,080 | 3,510 |

Peak-flow data used in the analysis:

Explanation of symbols and codes

- < Less than
- none
- * Less than low-outlier threshold

| Water year | Peak flow | Peak-flow code |
|---------------|--------------|-------------------|
| 1985 | 1,040 | -- |
| 1986 | 490 | -- |
| 1987 | 78 | * |
| 1988 | 35 | * |
| 1989 | 131 | -- |
| 1990 | 890 | -- |
| 1991 | 236 | -- |
| 1992 | 315 | -- |
| 1993 | 474 | -- |
| 1994 | 440 | -- |
| 1995 | 322 | -- |
| 1996 | 395 | -- |
| 1997 | 739 | -- |
| 1998 | 190 | -- |
| 1999 | 222 | -- |
| 2000 | <54 | * |
| 2001 | 738 | -- |
| 2002 | 542 | -- |
| 2003 | 241 | -- |
| 2004 | 166 | -- |
| 2005 | 231 | -- |
| 2006 | 309 | -- |
| 2007 | 241 | -- |
| 2008 | 167 | -- |
| 2009 | 788 | -- |
| 2010 | 655 | -- |
| 2011 | 830 | -- |