

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05311300 North Branch Yellow Medicine tributary number 2 near Porter, Minn.

**Peak-flow information:**

|   |      |
|---|------|
| Number of systematic peak flows in record | 16   |
| Systematic period begins                  | 1960 |
| Systematic period ends                    | 1975 |
| Length of systematic record               | 16   |
| 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                   | -0.3                             |
| Standard error of generalized skew | 0.4266                           |
| Low-outlier method                 | Single Grubbs-Beck test          |

**EMA systematic record analysis results:**

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

|        | Standard  |          |
|--------|-----------|----------|
| Mean   | deviation | Skewness |
| 1.9688 | 0.1971    | 0.934    |

**Low-outlier information:**

|                        |    |
|------------------------|----|
| Number of low outliers | 1  |
| Low-outlier threshold  | 55 |

**Final analysis results:**

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

|        | Standard  |          |  |
|--------|-----------|----------|--|
| Mean   | deviation | Skewness |  |
| 1.9652 | 0.2034    | 0.016    |  |

**Annual frequency curve at selected exceedance probabilities:**

[WIE, Weighted independent estimate; --, not computed]

| Exceedance<br>probability | Peak<br>estimate | Lower-95<br>level | Upper 95<br>level | WIE<br>estimate | Lower-95<br>WIE level | Upper 95<br>WIE level |
|---------------------------|------------------|-------------------|-------------------|-----------------|-----------------------|-----------------------|
| 0.9950                    | 27.8             | 8.58              | 40.9              | --              | --                    | --                    |
| 0.9900                    | 31.2             | 11.00             | 44.4              | --              | --                    | --                    |
| 0.9500                    | 42.8             | 22.70             | 56.9              | --              | --                    | --                    |
| 0.9000                    | 50.7             | 31.40             | 65.9              | --              | --                    | --                    |
| 0.8000                    | 62.2             | 43.60             | 79.6              | --              | --                    | --                    |
| 0.6667                    | 75.4             | 56.50             | 96.1              | --              | --                    | --                    |
| 0.5000                    | 92.2             | 71.50             | 119.0             | 90.6            | 72.1                  | 114                   |
| 0.4292                    | 100.0            | 78.30             | 131.0             | --              | --                    | --                    |
| 0.2000                    | 137.0            | 107.00            | 196.0             | 140.0           | 108.0                 | 180                   |
| 0.1000                    | 168.0            | 129.00            | 273.0             | 179.0           | 134.0                 | 239                   |
| 0.0400                    | 210.0            | 156.00            | 418.0             | 238.0           | 168.0                 | 337                   |
| 0.0200                    | 242.0            | 175.00            | 574.0             | 288.0           | 194.0                 | 427                   |
| 0.0100                    | 276.0            | 192.00            | 786.0             | 346.0           | 223.0                 | 538                   |
| 0.0050                    | 311.0            | 209.00            | 1,030.0           | --              | --                    | --                    |
| 0.0020                    | 359.0            | 230.00            | 1,400.0           | 502.0           | 288.0                 | 873                   |

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

Explanation of symbols and codes

-- none

\* Less than low-outlier threshold

| Water | Peak | Peak-flow |
|-------|------|-----------|
| year  | flow | code      |
| 1960  | 111  | --        |
| 1961  | 93   | --        |
| 1962  | 247  | --        |
| 1963  | 124  | --        |
| 1964  | 92   | --        |
| 1965  | 153  | --        |
| 1966  | 91   | --        |
| 1967  | 20   | *         |
| 1968  | 64   | --        |
| 1969  | 212  | --        |
| 1970  | 78   | --        |
| 1971  | 76   | --        |
| 1972  | 55   | --        |
| 1973  | 66   | --        |
| 1974  | 73   | --        |
| 1975  | 74   | --        |