

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05063200 Spring Creek tributary near Ogema, Minn.

**Peak-flow information:**

|   |      |
|---|------|
| Number of systematic peak flows in record | 27   |
| Systematic period begins                  | 1963 |
| Systematic period ends                    | 1989 |
| 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                   | -0.33                            |
| 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 |
| 1.7048 | 0.2537    | -1.171   |

**Low-outlier information:**

|                        |    |
|------------------------|----|
| Number of low outliers | 1  |
| Low-outlier threshold  | 15 |

**Final analysis results:**

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

|        | Standard  |          |  |
|--------|-----------|----------|--|
| Mean   | deviation | Skewness |  |
| 1.7067 | 0.2473    | -0.609   |  |

**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                    | 8.51             | 1.51              | 14.5              | --              | --                    | --                    |
| 0.9900                    | 10.60            | 2.34              | 17.0              | --              | --                    | --                    |
| 0.9500                    | 18.30            | 6.94              | 25.7              | --              | --                    | --                    |
| 0.9000                    | 23.90            | 12.30             | 32.0              | --              | --                    | --                    |
| 0.8000                    | 32.30            | 21.10             | 41.5              | --              | --                    | --                    |
| 0.6667                    | 41.90            | 30.80             | 52.6              | --              | --                    | --                    |
| 0.5000                    | 53.90            | 42.00             | 66.9              | 55.5            | 45.2                  | 68.3                  |
| 0.4292                    | 59.40            | 46.90             | 73.7              | --              | --                    | --                    |
| 0.2000                    | 82.90            | 67.10             | 105.0             | 89.8            | 73.7                  | 109.0                 |
| 0.1000                    | 101.00           | 81.70             | 134.0             | 113.0           | 91.0                  | 139.0                 |
| 0.0400                    | 121.00           | 96.90             | 176.0             | 142.0           | 111.0                 | 183.0                 |
| 0.0200                    | 135.00           | 106.00            | 211.0             | 166.0           | 124.0                 | 221.0                 |
| 0.0100                    | 148.00           | 113.00            | 249.0             | 191.0           | 138.0                 | 265.0                 |
| 0.0050                    | 160.00           | 118.00            | 290.0             | --              | --                    | --                    |
| 0.0020                    | 174.00           | 123.00            | 352.0             | 257.0           | 169.0                 | 392.0                 |

**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      |
| 1963  | 70   | --        |
| 1964  | 83   | --        |
| 1965  | 83   | --        |
| 1966  | 57   | --        |
| 1967  | 72   | --        |
| 1968  | 34   | --        |
| 1969  | 115  | --        |
| 1970  | 76   | --        |
| 1971  | 37   | --        |
| 1972  | 33   | --        |
| 1973  | 36   | --        |
| 1974  | 59   | --        |
| 1975  | 101  | --        |
| 1976  | 37   | --        |
| 1977  | 8    | *         |
| 1978  | 97   | --        |
| 1979  | 85   | --        |
| 1980  | 24   | --        |
| 1981  | 15   | --        |
| 1982  | 51   | --        |
| 1983  | 44   | --        |
| 1984  | 78   | --        |
| 1985  | 47   | --        |
| 1986  | 64   | --        |
| 1987  | 42   | --        |
| 1988  | 37   | --        |
| 1989  | 80   | --        |