

Annual Peak-Flow Frequency Analysis

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

**Streamgauge number and name:**

05476000 Des Moines River at Jackson, Minn.

**Peak-flow information:**

|   |      |
|---|------|
| Number of systematic peak flows in record | 86   |
| Systematic period begins                  | 1909 |
| Systematic period ends                    | 2011 |
| Length of systematic record               | 103  |
| Years without information                 | 17   |
| Number of historical peak flows in record | 0    |

**Frequency analysis options:**

|                                    |                                  |
|------------------------------------|----------------------------------|
| Method                             | Expected moments algorithm (EMA) |
| Skew option                        | Weighted                         |
| Generalized skew                   | -0.16                            |
| 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 |
| 3.2624 | 0.4093    | -0.422   |

**Low-outlier information:**

|                        |     |
|------------------------|-----|
| Number of low outliers | 1   |
| Low-outlier threshold  | 169 |

**Final analysis results:**

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

|        | Standard  |          |
|--------|-----------|----------|
| Mean   | deviation | Skewness |
| 3.2625 | 0.4088    | -0.331   |

**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                 | 121           | 39.8           | 206            | --           | --                 | --                 |
| 0.9900                 | 163           | 64.6           | 260            | --           | --                 | --                 |
| 0.9500                 | 358           | 210.0          | 494            | --           | --                 | --                 |
| 0.9000                 | 533           | 359.0          | 700            | --           | --                 | --                 |
| 0.8000                 | 845           | 633.0          | 1,070          | --           | --                 | --                 |
| 0.6667                 | 1,280         | 1,000.0        | 1,590          | --           | --                 | --                 |
| 0.5000                 | 1,930         | 1,550.0        | 2,380          | 1,930        | 1,570              | 2,370              |
| 0.4292                 | 2,270         | 1,840.0        | 2,810          | --           | --                 | --                 |
| 0.2000                 | 4,090         | 3,320.0        | 5,120          | 4,090        | 3,330              | 5,010              |
| 0.1000                 | 5,880         | 4,730.0        | 7,700          | 5,890        | 4,700              | 7,380              |
| 0.0400                 | 8,500         | 6,610.0        | 12,200         | 8,550        | 6,500              | 11,200             |
| 0.0200                 | 10,700        | 7,960.0        | 16,500         | 10,800       | 7,810              | 14,900             |
| 0.0100                 | 13,000        | 9,230.0        | 21,800         | 13,200       | 9,110              | 19,200             |
| 0.0050                 | 15,400        | 10,400.0       | 28,200         | --           | --                 | --                 |
| 0.0020                 | 18,900        | 11,800.0       | 38,800         | 19,600       | 11,900             | 32,300             |

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

Explanation of symbols and codes

-- none

\* Less than low-outlier threshold

| Water                    | Peak  | Peak-flow | Water | Peak   | Peak-flow |
|--------------------------|-------|-----------|-------|--------|-----------|
| year                     | flow  | code      | year  | flow   | code      |
| 1909                     | 1,700 | --        | 1962  | 5,350  | --        |
| 1910                     | 1,100 | --        | 1963  | 1,640  | --        |
| 1911                     | 169   | --        | 1964  | 1,130  | --        |
| 1912                     | 503   | --        | 1965  | 9,530  | --        |
| 1913                     | 358   | --        | 1966  | 1,130  | --        |
| Gap in systematic record |       |           | 1967  | 1,250  | --        |
| 1931                     | 61    | *         | 1968  | 854    | --        |
| 1932                     | 906   | --        | 1969  | 15,700 | --        |
| 1933                     | 1,600 | --        | 1970  | 1,680  | --        |
| 1934                     | 224   | --        | 1971  | 4,640  | --        |
| 1935                     | 500   | --        | 1972  | 1,620  | --        |
| 1936                     | 2,320 | --        | 1973  | 2,000  | --        |
| 1937                     | 1,150 | --        | 1974  | 924    | --        |
| 1938                     | 2,200 | --        | 1975  | 1,180  | --        |
| 1939                     | 499   | --        | 1976  | 1,020  | --        |
| 1940                     | 574   | --        | 1977  | 430    | --        |
| 1941                     | 1,940 | --        | 1978  | 2,150  | --        |
| 1942                     | 3,410 | --        | 1979  | 4,070  | --        |
| 1943                     | 2,490 | --        | 1980  | 2,830  | --        |
| 1944                     | 3,070 | --        | 1981  | 992    | --        |
| 1945                     | 2,300 | --        | 1982  | 1,130  | --        |
| 1946                     | 1,530 | --        | 1983  | 5,210  | --        |
| 1947                     | 2,100 | --        | 1984  | 7,770  | --        |
| 1948                     | 2,300 | --        | 1985  | 2,460  | --        |
| 1949                     | 3,350 | --        | 1986  | 4,980  | --        |
| 1950                     | 1,120 | --        | 1987  | 2,050  | --        |
| 1951                     | 4,380 | --        | 1988  | 874    | --        |
| 1952                     | 4,290 | --        | 1989  | 960    | --        |
| 1953                     | 8,360 | --        | 1990  | 999    | --        |
| 1954                     | 1,160 | --        | 1991  | 3,470  | --        |
| 1955                     | 630   | --        | 1992  | 2,710  | --        |
| 1956                     | 483   | --        | 1993  | 8,250  | --        |
| 1957                     | 1,230 | --        | 1994  | 3,090  | --        |
| 1958                     | 396   | --        | 1995  | 3,610  | --        |
| 1959                     | 3,370 | --        | 1996  | 4,070  | --        |
| 1960                     | 3,800 | --        | 1997  | 5,610  | --        |
| 1961                     | 2,140 | --        | 1998  | 1,910  | --        |

| Water<br>year | Peak<br>flow | Peak-flow<br>code |
|---------------|--------------|-------------------|
| 1999          | 2,360        | --                |
| 2000          | 1,200        | --                |
| 2001          | 6,550        | --                |
| 2002          | 706          | --                |
| 2003          | 1,380        | --                |
| 2004          | 2,530        | --                |
| 2005          | 3,250        | --                |
| 2006          | 4,910        | --                |
| 2007          | 3,490        | --                |
| 2008          | 2,580        | --                |
| 2009          | 1,230        | --                |
| 2010          | 8,570        | --                |
| 2011          | 6,860        | --                |