# Streamflow—Water Year 2017

## Introduction

The maps and graphs in this summary describe national streamflow conditions for water year 2017 (October 1, 2016, to September 30, 2017) in the context of streamflow ranks relative to the 88-year period of 1930–2017, unless otherwise noted. The illustrations are based on observed data from the U.S. Geological Survey (USGS) National Streamflow Network (U.S. Geological Survey, 2018a). The period of 1930–2017 was used because the number of streamgages before 1930 was too small to provide representative data for computing statistics for most regions of the country.

In the summary, reference is made to the term "runoff," which is the depth to which a river basin, State, or other geographic area would be covered with water if all the streamflow within the area during a specified period was uniformly distributed on it. The value of runoff quantifies the magnitude of water flowing through the Nation's rivers and streams in measurement units that can be compared from one area to another. In this summary, runoff for a specified period and geographic area is computed from all streamgages with complete record in the geographic area.

In all the graphics, a rank of 1 indicates the highest annual flow of all years analyzed and 88 indicates the lowest annual flow of all years. Rankings of streamflow are grouped into much below normal, below normal, normal, above normal, and much above normal based on percentiles of flow (less than 10 percent, 10–24 percent, 25–75 percent, 76–90 percent, and greater than 90 percent, respectively; U.S. Geological Survey, 2018b). States or water-resources regions are presented in the text in order of ranking; a highest or lowest rank is not shown when there are ties in the rankings. Some of the data used to produce the maps and graphs are provisional and subject to change.

## National Overview

Annual runoff in the Nation's rivers and streams during water year 2017 (10.86 inches) was higher than the long-term (1930–2017) mean annual runoff of 9.33 inches for the contiguous United States (fig. 1). Nationwide, the 2017 streamflow ranked 10th highest out of the 88 years.

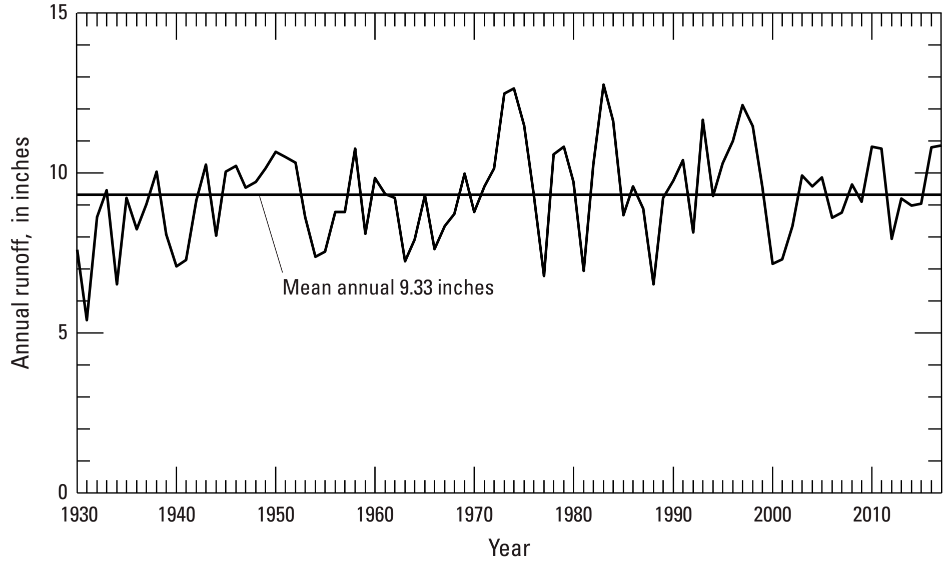



**Figure 1.** Annual runoff in the United States, 1930–2017.

Record low streamflow levels were reported in Alaska (fig. 2). Streamflow was below normal in Hawaii, Georgia, New Jersey, Connecticut, and Tennessee. Streamflow was above normal in Illinois, Vermont, Utah, Montana, Washington, New York, Iowa, Indiana, Idaho, and Puerto Rico and the Virgin Islands. Streamflow was much above normal in Minnesota, Oregon, Nevada, Michigan, California, Wisconsin, and Wyoming. Most States had streamflow in the normal range.

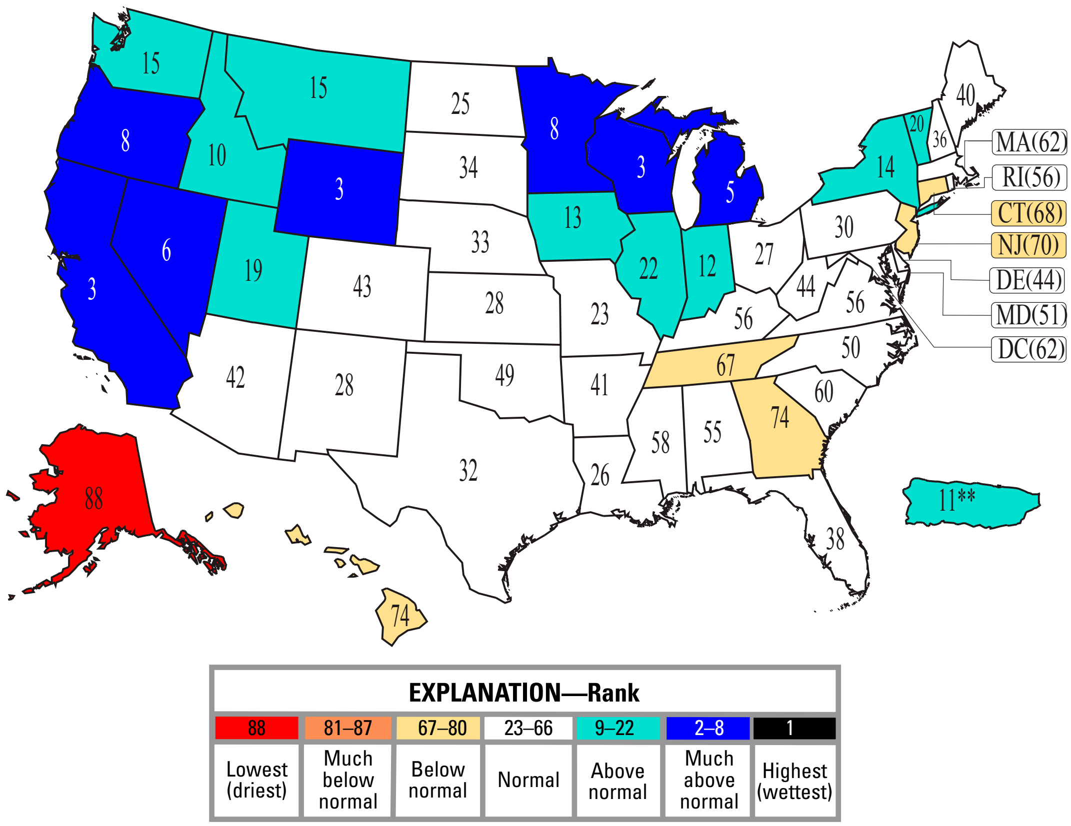



**Figure 2.** Statewide streamflow ranks of the United States for water year 2017 relative to 1930–2017 mean annual streamflow. [**For Puerto Rico and the Virgin Islands, 74 years of available data were used and the rank was adjusted accordingly.]

## Regional Patterns

The United States (including Puerto Rico and the Virgin Islands and the District of Columbia) is divided into 21 large drainages, or water-resources regions (fig. 3). These water-resources regions are based on surface topography and contain the drainage area of a major river; the combined drainage areas of a series of rivers, such as the Texas-Gulf region, which includes several rivers draining into the Gulf of Mexico; or the area of an island or island group. Water-resources regions provide a coherent, watershed-based framework for depicting streamflow variations.

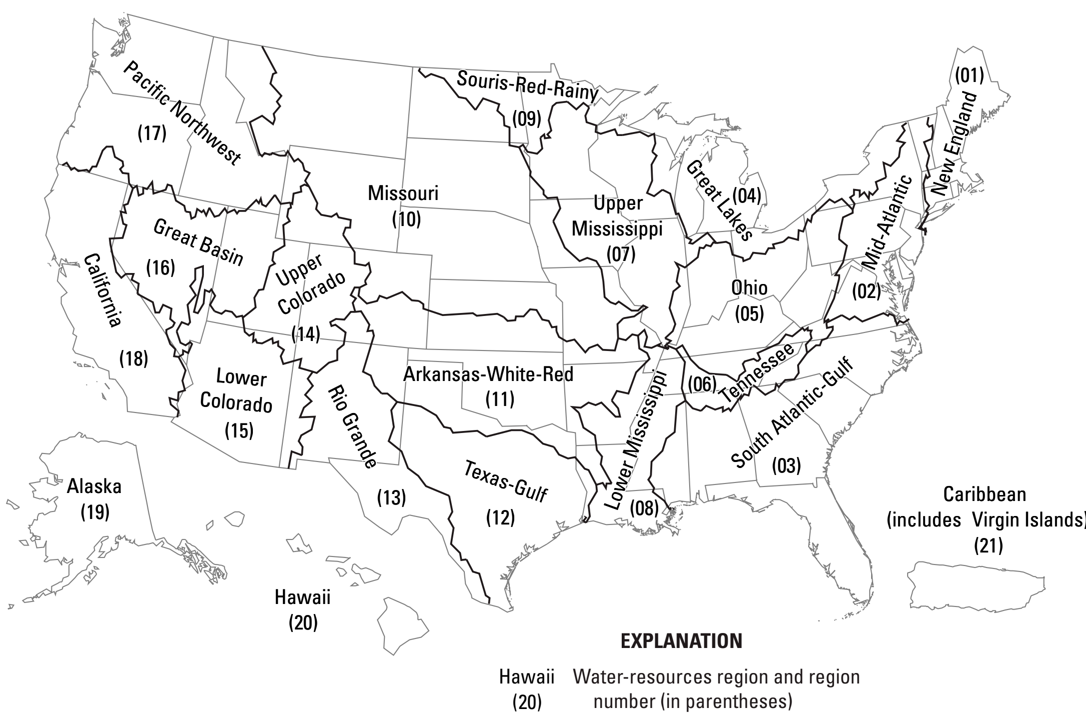



**Figure 3.** Water-resources regions of the United States.

Streamflow was reported at record low levels in the Alaska region (fig. 4). Below normal streamflow was reported in the Hawaii and Tennessee regions. Streamflow was above normal in the Souris-Red-Rainy, Caribbean, and Upper Mississippi regions. Much above normal streamflow was reported in the Great Basin, Pacific Northwest, California, and Great Lakes regions.

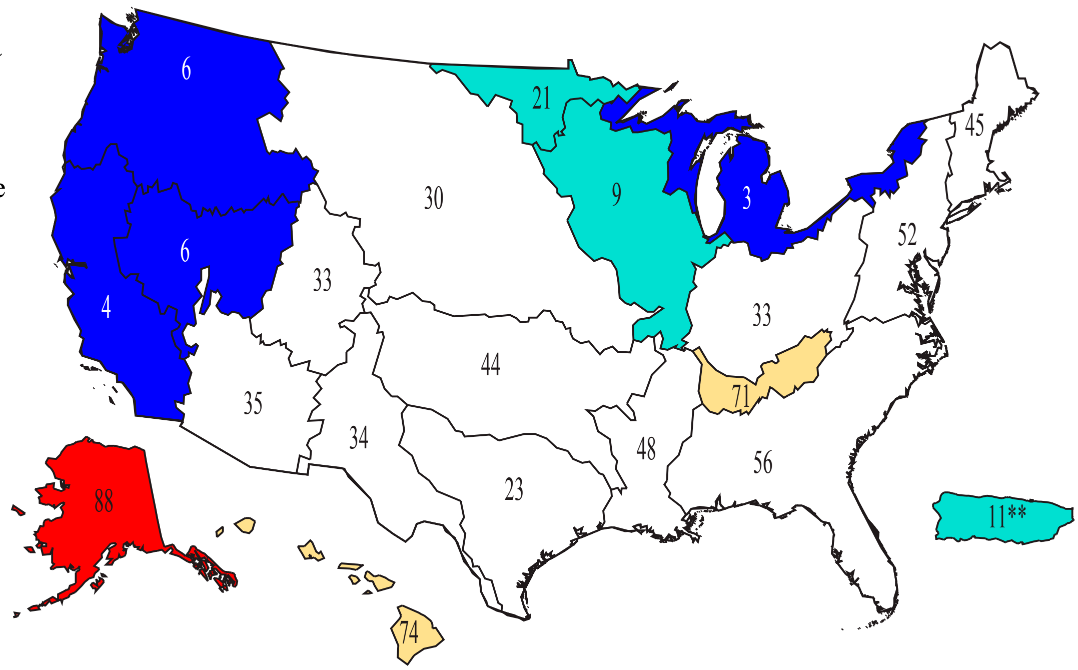
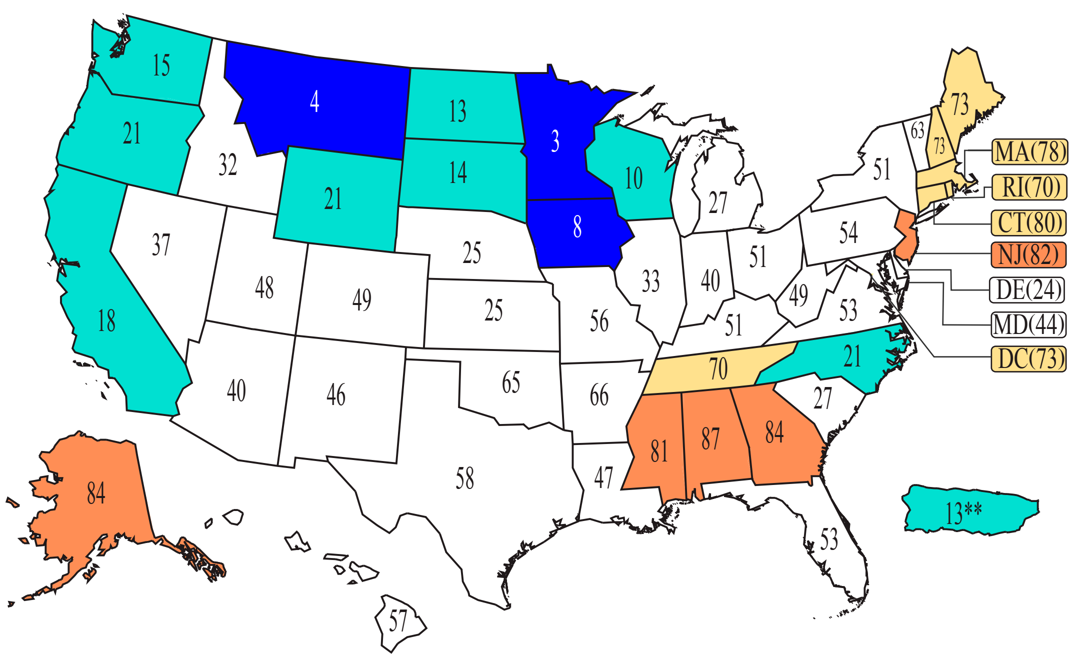



**Figure 4.** Regional streamflow ranks in the United States for water year 2017 relative to 1930–2017 mean annual streamflow. [**For Puerto Rico and the Virgin Islands, 74 years of available data were used and the rank was adjusted accordingly.]

| EXPLANATION—Rank | | | | | | |
|---|---|---|---|---|---|---|
| 88 | 81–87 | 67–80 | 23–66 | 9–22 | 2–8 | 1 |
| Lowest (driest) | Much below normal | Below normal | Normal | Above normal | Much above normal | Highest (wettest) |

## Seasonal Characteristics

Autumn (October–December 2016) streamflow was much below normal in Alabama, Alaska, Georgia, New Jersey, and Mississippi (fig. 5). Streamflow was below normal in Connecticut, Massachusetts, the District of Columbia, Maine, New Hampshire, Rhode Island, and Tennessee. Above normal streamflow was reported in North Carolina, Oregon, Wyoming, California, Washington, South Dakota, North Dakota, Puerto Rico and the Virgin Islands, and Wisconsin. Much above normal streamflow was reported in Iowa, Montana, and Minnesota. Nationwide, autumn-season streamflow ranked 52d highest out of 88 years.




| EXPLANATION—Rank | | | | | | |
|---|---|---|---|---|---|---|
| 88 | 81–87 | 67–80 | 23–66 | 9–22 | 2–8 | 1 |
| Lowest (driest) | Much below normal | Below normal | Normal | Above normal | Much above normal | Highest (wettest) |

**Figure 5.** Autumn (October–December 2016) statewide ranks in the United States relative to 1930–2017 mean annual streamflow. [**For Puerto Rico and the Virgin Islands, 74 years of available data were used and the rank was adjusted accordingly.]

Winter (January–March 2017) streamflow was much below normal in North Carolina, the District of Columbia, Alaska, and Mississippi (fig. 6). Streamflow was below normal in Connecticut, New Jersey, Tennessee, Virginia, Maryland, South Carolina, Missouri, Alabama, Oklahoma, Arkansas, Delaware, Florida, Georgia, Kentucky, Rhode Island, Hawaii, and Louisiana. Above normal streamflow was reported in Vermont, Puerto Rico and the Virgin Islands, New York, Arizona, Washington, New Mexico, North Dakota, Iowa, Michigan, and Utah. Streamflow was much above normal in Colorado, Montana, Oregon, Idaho, Wisconsin, California, Minnesota, Nevada, and Wyoming. Nationwide, winter-season streamflow ranked 32d highest out of 88 years.

Spring (April–June 2017) streamflow was much below normal only in Alaska (fig. 7). Below normal streamflow was reported in Arizona and Georgia. Above normal streamflow was reported in Oklahoma, Iowa, Pennsylvania, Mississippi, Ohio, Alabama, Vermont, Kansas, Massachusetts, Montana, Arkansas, Nevada, New Mexico, Rhode Island, Oregon, Louisiana, Washington, New York, North Carolina, Maine, Virginia, California, and New Hampshire. Streamflow much above normal was reported in Illinois, Idaho, Indiana, Michigan, Wisconsin, Missouri, and Wyoming. Nationwide, spring-season streamflow ranked fourth highest out of 88 years.

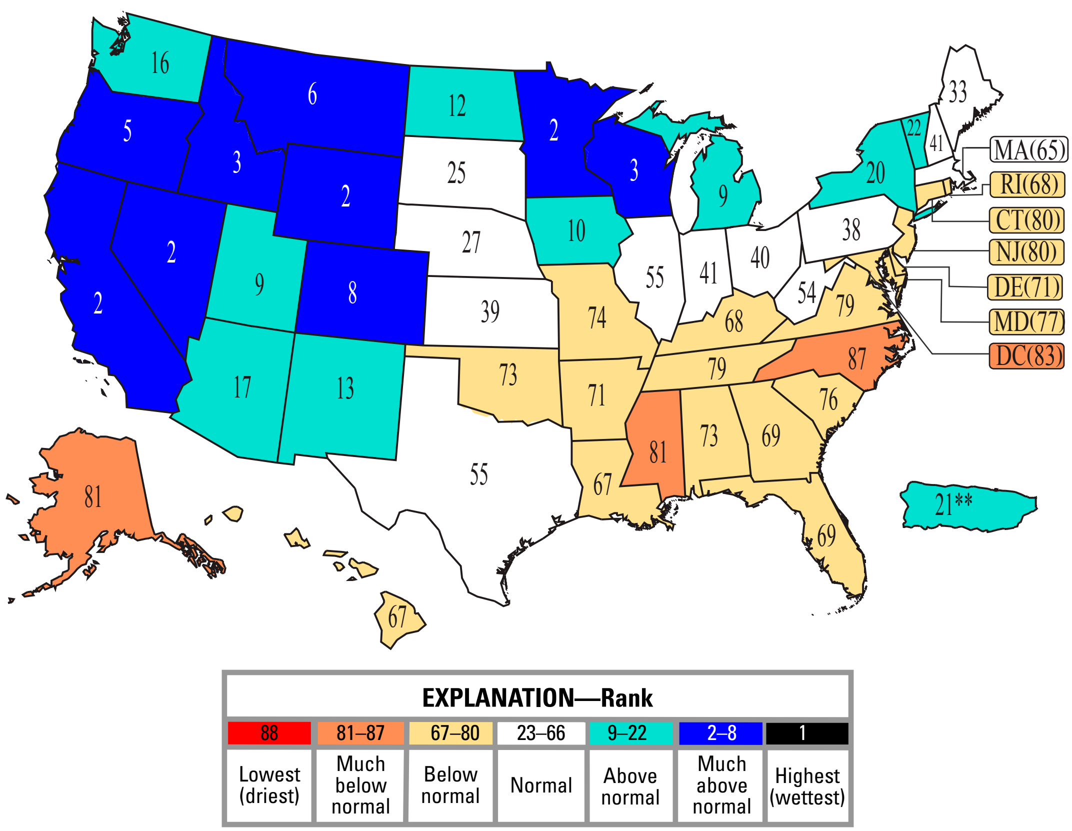



**Figure 6.** Winter (January–March 2017) statewide ranks in the United States relative to 1930–2017 mean annual streamflow. [**For Puerto Rico and the Virgin Islands, 74 years of available data were used and the rank was adjusted accordingly.]

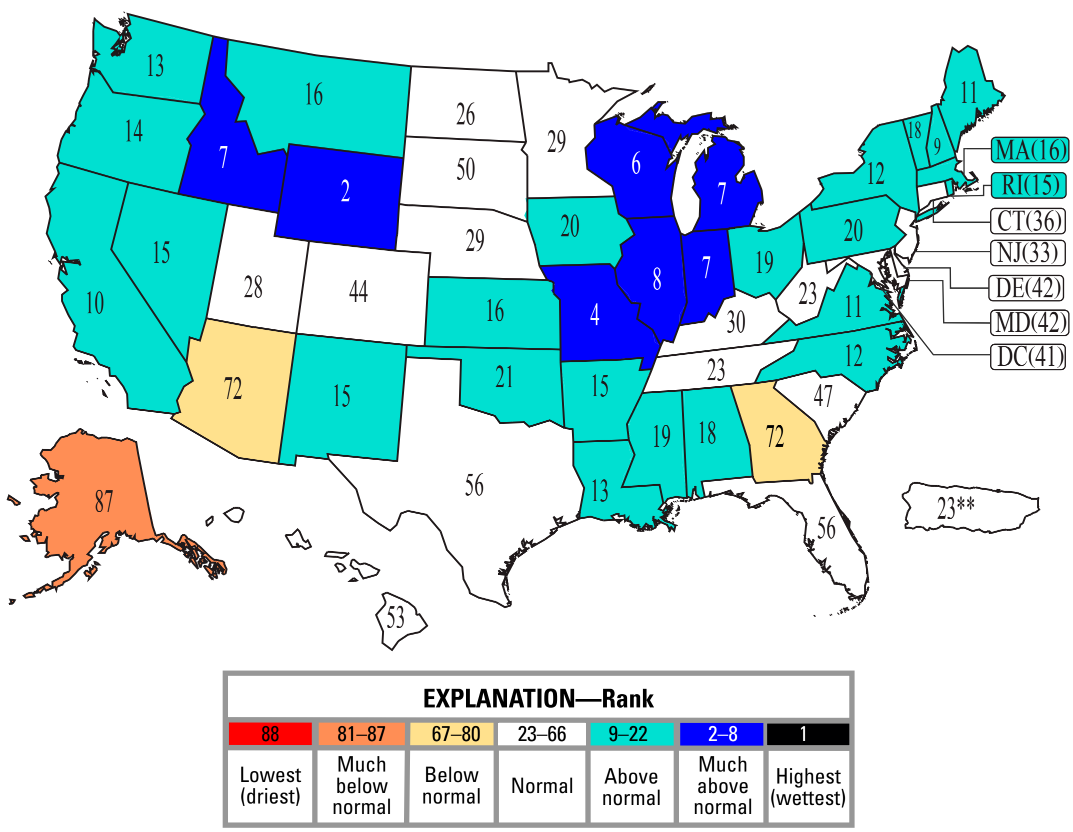



**Figure 7.** Spring (April–June 2017) statewide ranks in the United States relative to 1930–2017 mean annual streamflow. [**For Puerto Rico and the Virgin Islands, 74 years of available data were used and the rank was adjusted accordingly.]

Summer (July–September 2017) streamflow was much below normal only in Alaska (fig. 8). Below normal streamflow was reported in Hawaii, Arizona, Maine, and Washington. Above normal streamflow was observed in Missouri, Kentucky, Oklahoma, Wyoming, Nevada, Tennessee, Maryland, Vermont, New York, Ohio, Alabama, Arkansas, Wisconsin, the District of Columbia, and Indiana. Much above normal streamflow was reported in Florida, Michigan, Mississippi, California, Puerto Rico and the Virgin Islands, Louisiana, New Mexico, and Texas. Nationwide, summer-season streamflow ranked seventh highest out of 88 years.

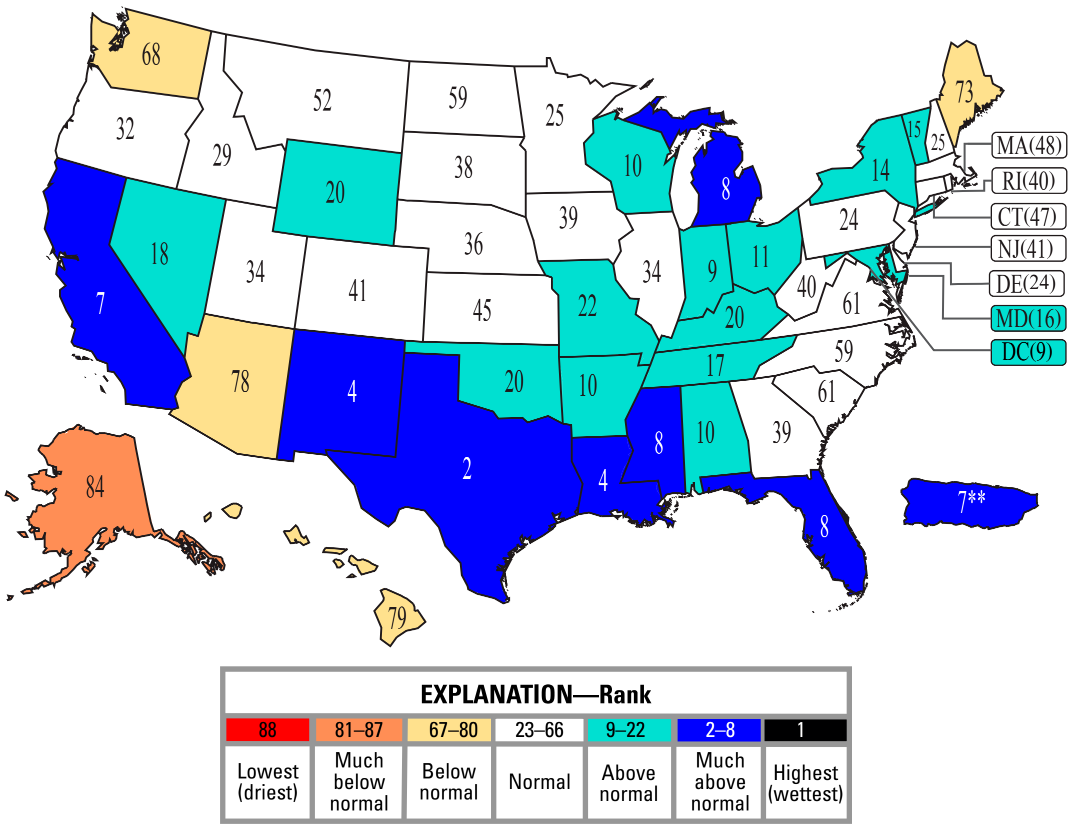



**Figure 8.** Summer (July–September 2017) statewide ranks in the United States relative to 1930–2017 mean annual streamflow. [**For Puerto Rico and the Virgin Islands, 74 years of available data were used and the rank was adjusted accordingly.]

## High and Low Flows

Assuming that individual streamgages act independently of each other, it is expected that the average streamflow at 5 percent of the streamgages will be high (greater than the 95th percentile) and 5 percent will be low (less than the 5th percentile) in any given month. The percentages of streamgages reporting high streamflow in 8 months of water year 2017 (October 2016 and January, February, March, April, May, July, and August 2017) were higher than expected (8, 10, 13, 12, 9, 11, 7, and 6 percent, respectively; fig. 9). In contrast, there were 3 months (November, February, and March) with a greater-than-expected percentage of streamgages with low flows (7, 8, and 7 percent, respectively).

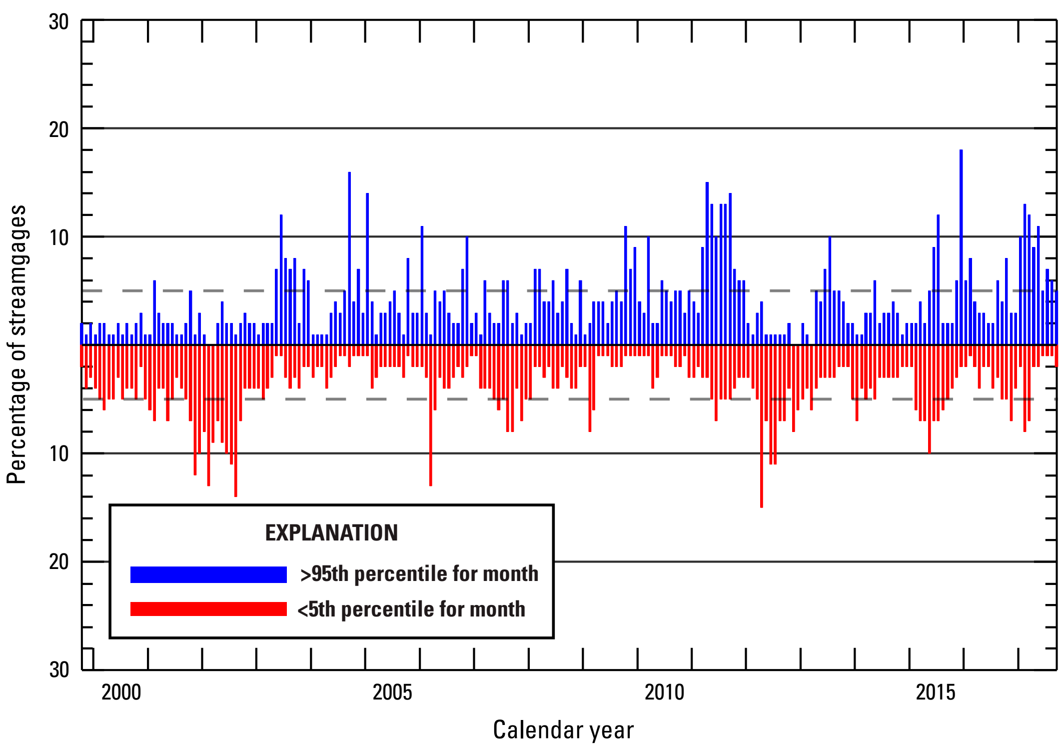



**Figure 9.** Percentage of streamgages with high and low monthly streamflow, October 1999–September 2017.

## Additional Information

The USGS operated a nationwide network of more than 8,200 streamgages in 2017, and almost all USGS streamgages are operated in real time. Current (2018) information derived from these stations is available at https://waterwatch.usgs.gov. Tables of data that summarize historical streamflow conditions by State, expressed as runoff, beginning in water year 1901, can be accessed at https://waterwatch.usgs.gov/?id=statesum. These tables are updated every few months to reflect the most current streamflow data.

The streamflow information used to prepare this summary also is used for water management, flood and drought monitoring, bridge design, and several recreational activities. To obtain real-time and archived streamflow data and information, visit https://doi.org/10.5066/F7P55KJN. The National Streamflow Network, which is part of the Groundwater and Streamflow Information Program, is operated primarily by the USGS; however, funding for operating the network is provided by the USGS and about 850 Federal, State, tribal, regional, and local partners. Access additional streamflow information online at https://www.usgs.gov/gwsip.

## References

U.S. Geological Survey, 2018a, Groundwater and Streamflow Information Program: U.S. Geological Survey web page, accessed June 2018 at https://www.usgs.gov/water-resources/groundwater-and-streamflow-information.

U.S. Geological Survey, 2018b, Map of real-time streamflow compared to historical streamflow for the day of the year (United States): U.S. Geological Survey web page, accessed June 2018 at https://waterwatch.usgs.gov/?id=ww_current.

*By Xiaodong Jian, David M. Wolock, Steven J. Brady, and Harry F. Lins*

**For additional information, contact:**

U.S. Geological Survey
415 National Center
Reston, VA 20192
https://water.usgs.gov/

Publishing support provided by the Rolla Publishing Service Center

ISSN 2327-6932 (online)
https://doi.org/10.3133/fs20183056