National Weather Service
Southeast River Forecast Center

**How Much Rain Will It Take To Fill Lake Lanier?**
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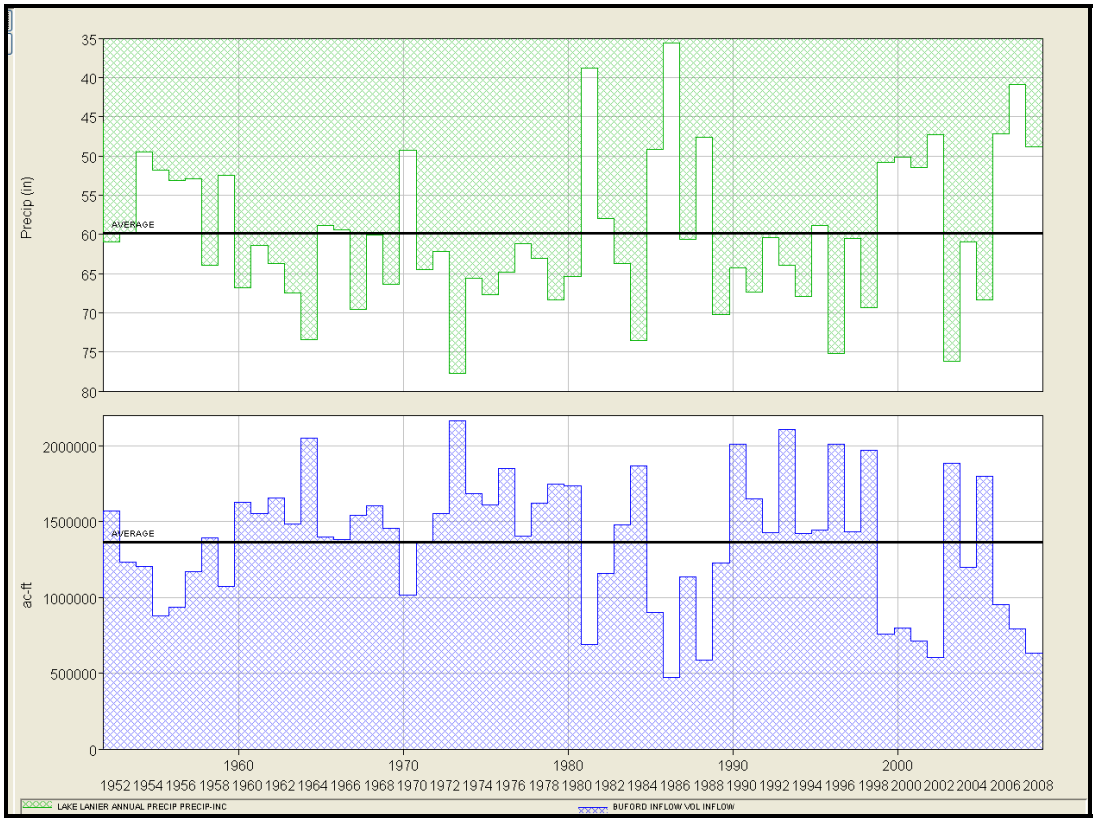
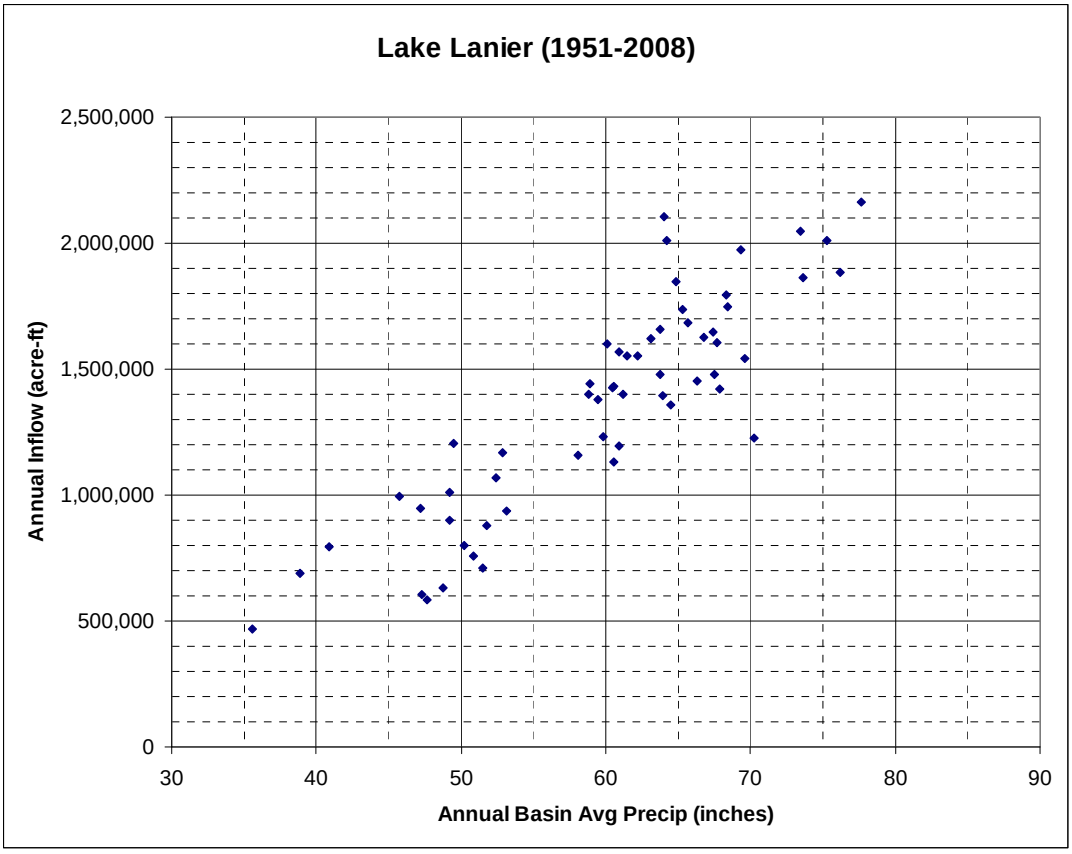
A frequently asked question is, "How much rain will it take to fill Lake Lanier?"

To answer this question, the Southeast River Forecast Center calculated annual basin-average precipitation for the Lake Lanier watershed from 1951 through 2008, along with annual inflow into the lake. In the figure below, the precipitation is plotted in green, and the inflow volume (in acre feet) is plotted in blue.




In general, the precipitation and inflow volume appear to be very well correlated. Notice that the average annual precipitation is about 60 inches, and the average annual inflow is about 1.36 million acre-feet.

We then plotted the basin-average precipitation against annual inflow volume (the data is based on water year, not calendar year) to get a better understanding of the correlation and its variability.




As expected, there is an upward trend; i.e., years with higher rainfall resulted in higher inflows into the lake. However, there is some variability around this trend. For example, given an average rainfall of 60 inches, there have been annual inflows varying from about 1.1 to 1.6 million acre-feet. Since the Lake Lanier basin has experienced recent drought conditions, one might expect that this year would be on the lower side of this range if we were to get normal rainfall.

Lake Lanier's pool was at 1054 feet msl at the beginning of this water year (1.37 million acre-ft). To get to full pool at elevation 1071 feet msl, an additional 585,000 acre-ft of inflow is needed. However, this assumes no outflow. If we apply the annual average outflow of last year for this year (1070 cfs), 775,000 acre-ft are released downstream. So the total inflow volume needed to fill the reservoir and sustain a release similar to last year is 1.36 million acre-ft.

Based on the plot above, this would put the total annual precipitation at around 65 inches (following the lower end of the trend). This is only about 10% above normal. Given the record-low lake levels, one would expect more rain would be needed to fill the lake. However, it is important to remember that outflows from the dam have been reduced during the current drought, which increases the filling efficiency of the lake. The Lanier watershed has received about six inches of rain so far this water year. So we would need an additional 60 inches or so to fill Lake Lanier to full pool, assuming release rates are similar to last year.

Thus, if reduced outflows are maintained through 2009, and rainfall was to return to normal, significant improvement in lake elevation levels would result.

Note: There are a number of assumptions in this calculation, including antecedent conditions, seasonal variability of rainfall, intensity of rainfall, and, of course, reservoir release rates. However, it can give a general indication of what type of inflow volume can be expected given an amount of rainfall.