National Weather Service
Southeast River Forecast Center

Location: **Inflows into Lake Lanier – Georgia**

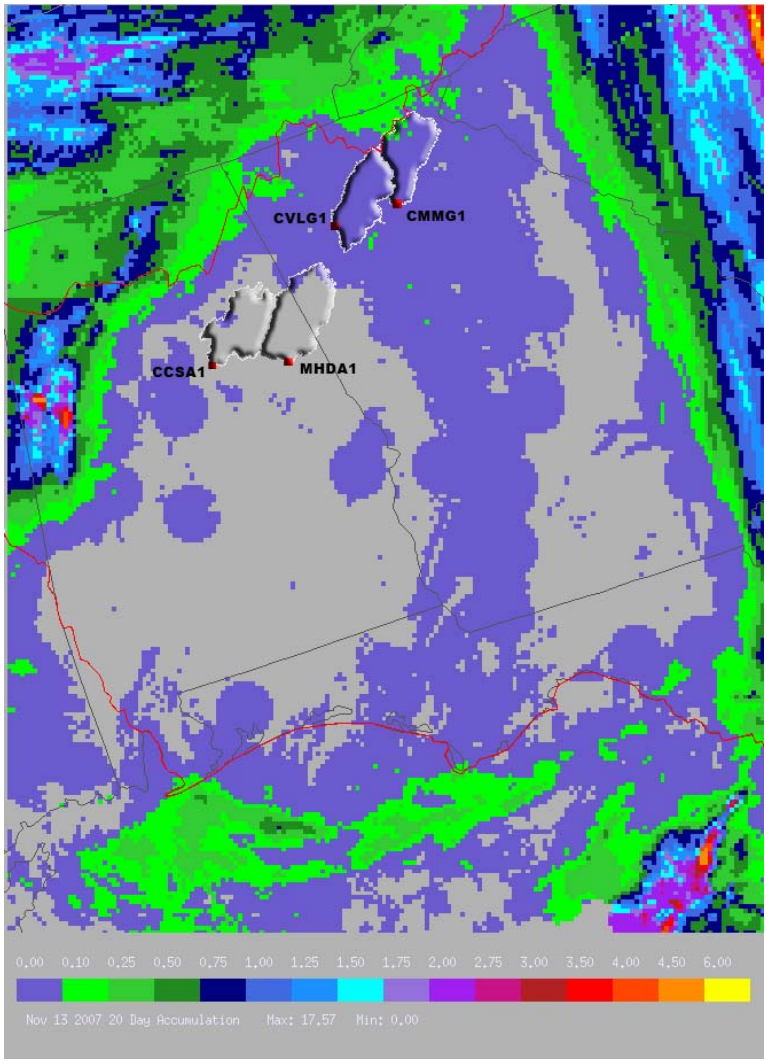
Issued: November 15, 2007

…Significant Drought Relief Not Expected Into Early December…

Our Forecast – Key Points

- A little more rain, but minimal hydrological significance.
- Increasing frontal passages, but fast movement will limit rainfall.
- Three to four inches of rainfall needed before significant runoff and reservoir inflow commences.

Hydrometeorological Basin Analysis



Some of the driest weather of the fall occurred over the past few weeks. Following is a multi-sensor rainfall estimate from the Southeast River Forecast Center for a 20-day period ending November 13th.

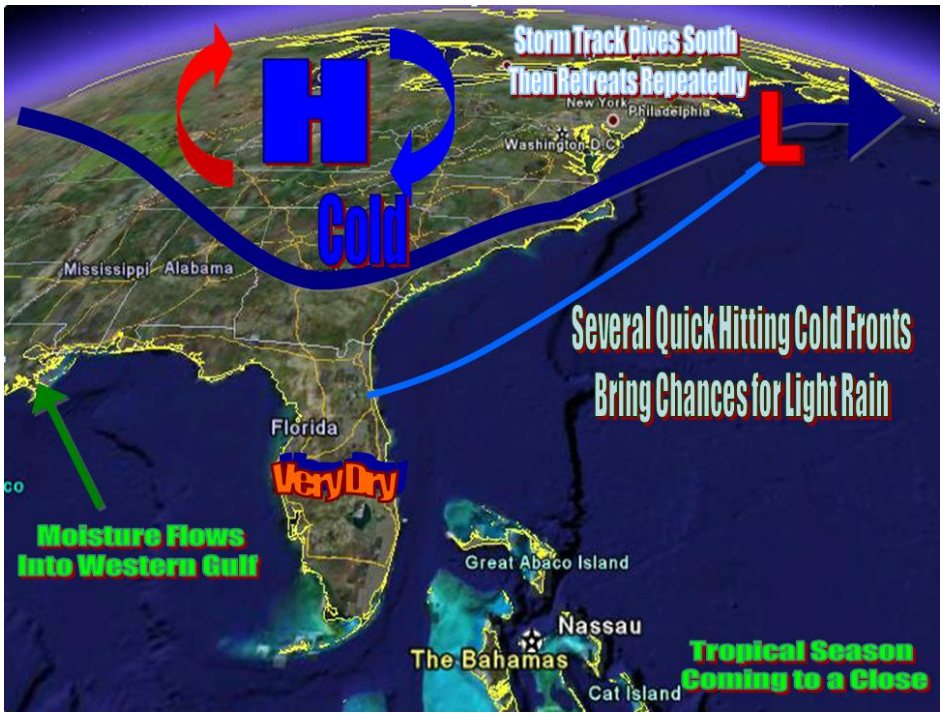
Lakes Lanier (CMMG1) and Allatoona (CVLG1) in Georgia and Logan Martin (CCSA1) and Harris Reservoirs (MHDA1) in Alabama are highlighted.

All of these drainage areas received less than 0.10 inches of rainfall since late October. Many of these areas are a foot or more below normal rainfall for the year.

0.10 inch or less rainfall.

Virtually zero rainfall for a 20-day period ending November 13th.

Looking Ahead Into December



Last week, several numerical (medium-range) meteorological models hinted at a significant rain event for the Southeast U.S. with the possibility of one to three inches of rain over North Georgia. This event was forecast to be similar to our last decent rain event way back in mid October. At that time, a cut-off low developed and remained stationary over Alabama, funneling abundant moisture northward from the Gulf and in from the Atlantic.

Unfortunately, these models gradually began to downplay the rain system as it neared, forecasting less than a half inch for north Georgia.

Meteorological models typically trend towards climatology beyond seven days out. Late November and early December is a transition time as we head from fall into winter. Models tend to forecast “typical” weather after seven days.

One issue we have this year is that it is definitely not “typical.” As we head into December, the area transitions from the dry and quiet fall into the more volatile winter, with stronger weather systems. Often times, a surface low will develop which will help transport moisture from the Gulf of Mexico into the Southeast U.S., thereby increasing chances of rain.

While this is what would typically happen, there is currently no sign for this transition to occur anytime soon. Current weather patterns seem to be about three weeks behind schedule. Thus, the short-term weather is tending towards a quiet fall pattern than a more active winter regime.

For the rest of November, quick hitting cold fronts will bring deep upper troughs into the Southeast U.S., with pushes of very chilly air. These fronts are expected to move so fast

that there will not be enough time for the transport of moisture from the Gulf. Unfortunately, this will limit the chance for significant rainfall.

Looking ahead through November into early December, northern portions of Georgia and Alabama will see one or two cold front passages per week, each with a chance of rain. Due to the progressive nature of these fronts, each rain event will last for only a six-hour period or so. Total basin average rain accumulations through the end of November will be 1.0 to 1.5 inches across north Georgia.

Longer-range climate models predict a dry December, but by the end of November it will be evident whether or not a shift into a winter weather pattern will happen anytime soon …or not.

Inflow Considerations

Once rains start, needed inflows into reservoirs will not immediately commence. The SERFC has calculated some general inflow scenarios.

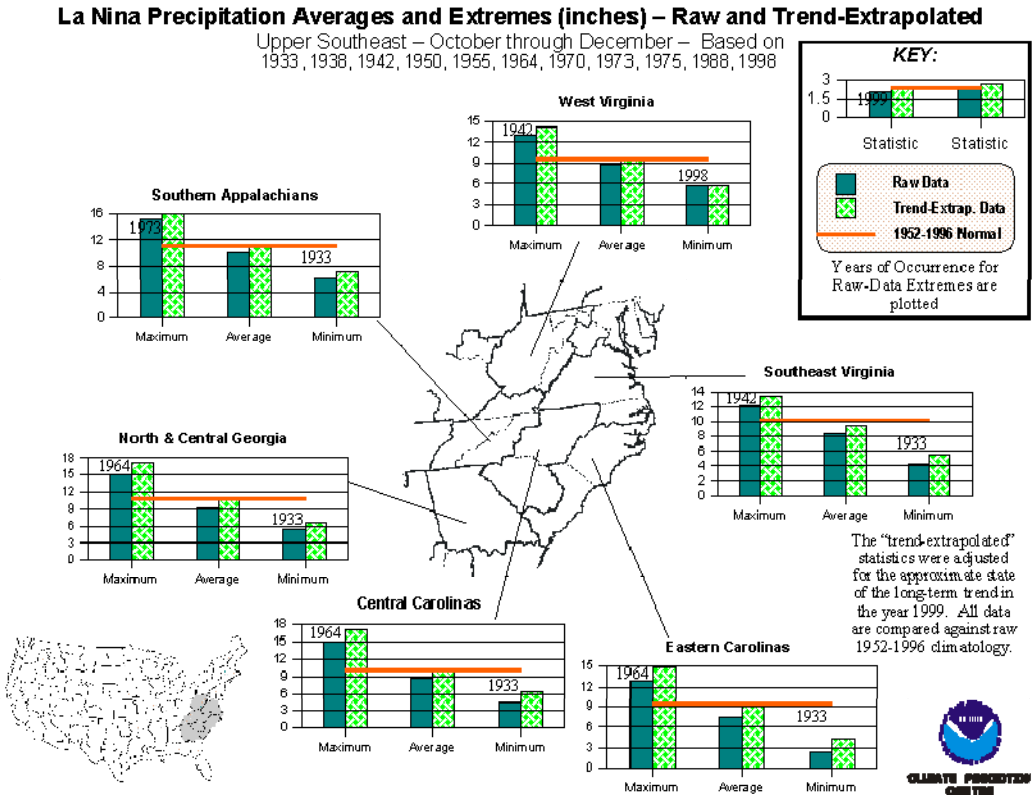
Inches of Rainfall	Hydrologic Impact Across Northern Alabama/Georgia
1 inch	Minimal runoff and inflow. Modest recharge of upper soils. No change in reservoir elevations due to inflow.
2 – 3 inches	Minimal runoff and inflow. Significant recharge of upper soils. Steady reservoir elevation or minimal rise due to increased inflows.
3 – 4 inches	Start of more significant runoff and inflow. Notable rises on smaller tributaries. Slight to modest rises on larger streams. Modest reservoir elevation rises due to increased inflows.
4 – 6 inches	Significant runoff and inflow. Significant rises on smaller tributaries. Notable rises on larger streams. More significant reservoir elevation rises due to increased inflows.

In summary, improvement in reservoir pool elevations will depend on the intensity, duration, and frequency of rain events. Rough estimates would indicate that it will take three to four inches of rainfall before inflows increase to such a degree to produce modest reservoir rises.

Longer-Term Outlook

The Climate Prediction Center's (CPC) forecast for November through January continues to show an elevated chance for below-normal precipitation. An explanation of what these percentages mean can be found in the last two Critical Water Watch issuances. This forecast is based on strengthening La Nina conditions in the equatorial Pacific Ocean. Signals from previous La Ninas are represented in figure 1. The north and central Georgia regions are represented in this schematic produced by CPC.

Average rainfall for the October through December time frame is near 11 inches, with the average during La Nina years being between 9 and 10 inches. There have been years that have been well above and well below normal based on a La Nina signal. The Ohio and Tennessee River Valley areas tend to be wet during the winter during a La Nina event. Therefore, the gradient between above and below normal is just north of Georgia. This leaves north and central Georgia with more potential for improvement for the rest of the fall season and early winter.



As we shift out of the dry fall season and move towards winter with lower evapotranspiration rates, December and January should offer a better opportunity to see improvement. The next Critical Water Watch in mid November will begin to look at winter rainfall potential.

Technical Discussion

The figures below are two Ensemble Streamflow Prediction (ESP) forecasts for inflows into Lake Lanier. Figure 2 was initiated on 10/15 and Figure 3 on 10/29. There are two reasons for a change in the graphs over this two-week period. First, there was some rainfall over the basin since 10/15 which affected soil moisture conditions, making it more conducive to runoff. The second reason is that our 45-day window has shifted into the first half of December, which (climatologically) receives more rain than October and November.

It is important to remember that the Lake Lanier Basin will receive some degree of rainfall this winter. Even below-normal rainfall will result in runoff, increased inflows, and higher pool elevation levels. The more critical issue is how much improvement will we see over the winter months, and will it be enough to get us through another summer, especially if the trend of below-normal rainfall continues.

Figure 2

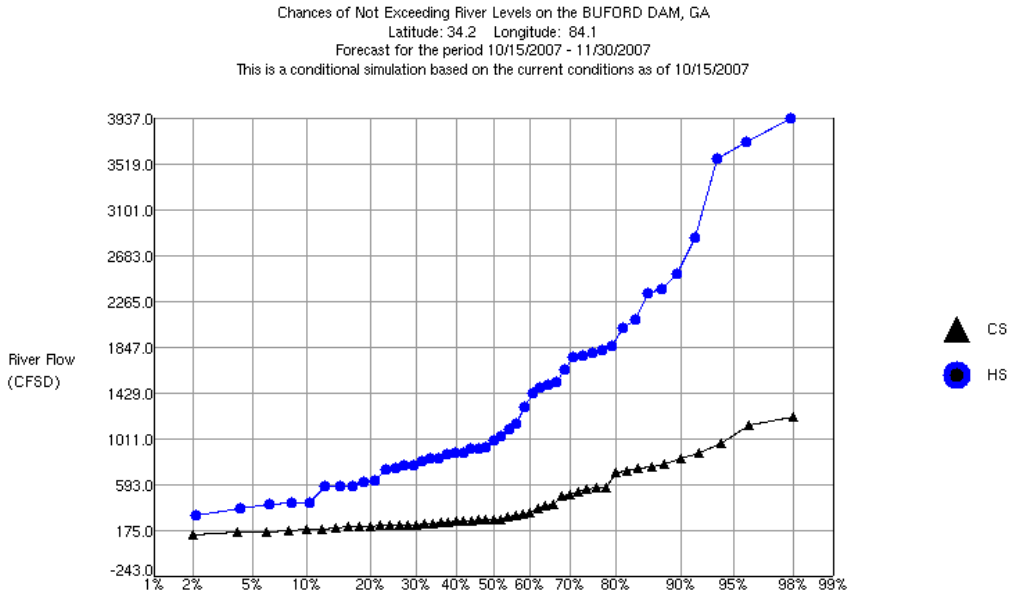
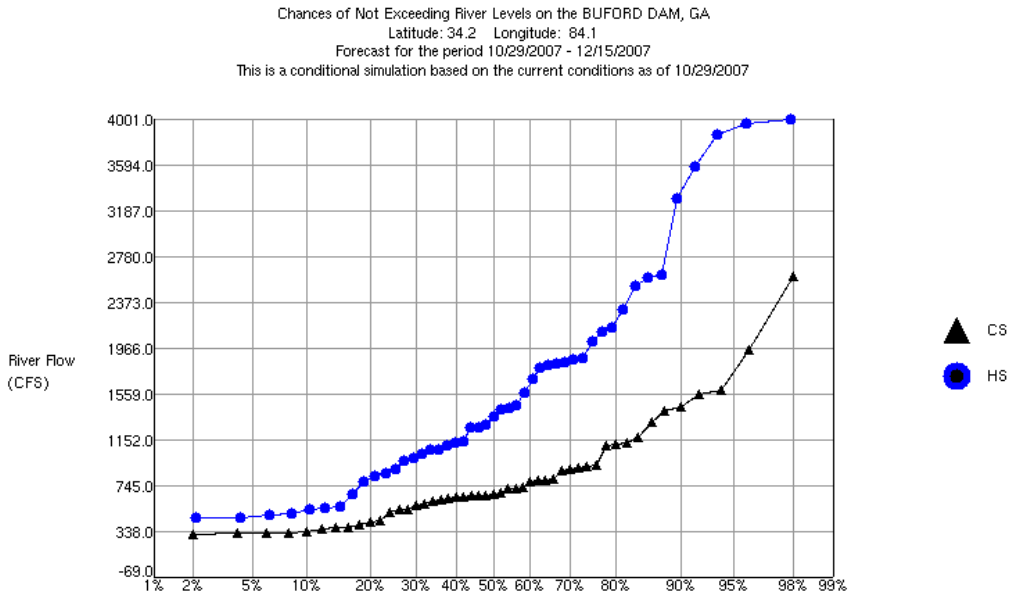


Figure 3



In the following table, the SERFC has put together several scenarios to illustrate what magnitude of rainfall it will take based on soil moisture conditions and current regulated outflows by the Corps of Engineers. It is important to note that we incrementally increased the rainfall from 1 to 4 inches and distributed the amounts equally over four 6-hour periods in the model.

These estimated results provide guidance as to what it will take to end the prolonged lake elevation falls and start to raise pool levels. Remember that it is normal for lake levels to be dropping during this time of year if there is minimal tropical activity. One inch of rainfall over 24 hours barely slowed the current rate of fall. This is indicative of the current dry soil moisture conditions. Four inches of rainfall over a 24-hour period produced enough runoff to raise the pool 1.4 feet over 5 days. After that rise, with no more rainfall, the pool began to fall again, albeit slower than its current recession.

So this gives rise to the big question that everyone has: What will it take to fill North Georgia reservoirs, specifically, Lake Lanier? The exact number of inches of rain is difficult to determine due to many variables. However, receiving small amounts of rain spaced a week or more apart will not significantly improve conditions. Significant improvement will come with heavy rain events every 3 to 4 days so that soils stay wet and most of the rainfall is converted to runoff. It would take a cumulative total of over a foot of rain, from multiple rain events, to raise the pool back to normal levels. That is the short-term answer to filling the reservoirs. Longer-term issues are a little different. Long-term relief will require receiving significant amounts of rainfall over a prolonged period of time.

Lake Lanier Scenarios

The following scenarios are based on rainfall distributed evenly over a 24-hour period for the entire basin.

Rainfall rate	Scenario
1 inch	No impact. Lake would continue to fall, but the rate of fall would decrease by 50% for about 2 days
2 inches	Only minimal impact. The lake elevation would start to only very slowly rise. It would rise by 0.2 feet within 1.5 days, then start to slowly fall again.
3 inches	Only minimal impact. The lake elevation would rise by 0.7 feet over 3 days then hold steady.
4 inches	Start of a more significant rise. The lake elevation would rise 1.4 feet over 5 days then hold steady.

This information will be updated bi-weekly. For additional information, contact the SERFC at (770) 486-0028 X1.

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