National Weather Service
Southeast River Forecast Center

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

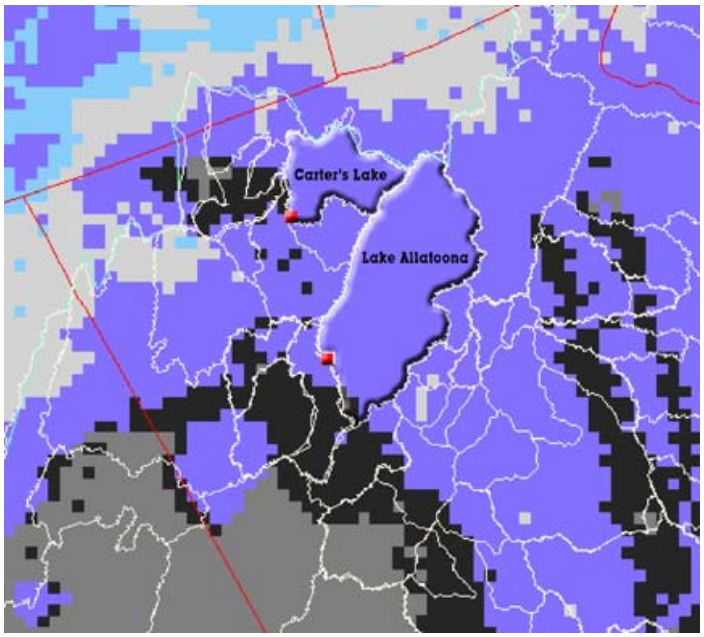

Updated: November 8, 2007

**Our Forecast – Key Points**

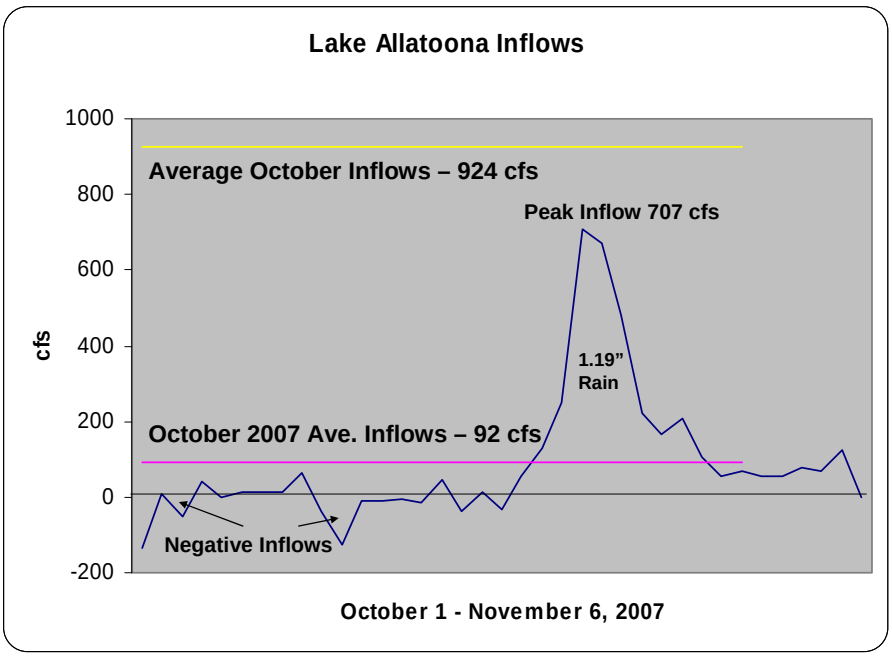
- Increased Chance for Mid/Late November Rain. Main Hydrologic Impact Will Be Improvement in Upper Soil Moisture.
- 5- to 7-Day Period of Increased Inflows but Still Averaging Below Normal.
- Slight Improvement in (45- and 90-Day) Inflow Forecast Probabilities, but Still Well Below Normal.

Hydrometeorological Basin Analysis

No significant rain fell over the Lake Allatoona drainage area within the past 14 days. Following is an NWS/SERFC multi-sensor rainfall graphic. Area of blue over the entire Allatoona basin indicates less than 0.10 inch of rain over the past two weeks.




The following graphic shows inflows into Lake Allatoona, Georgia, since October 1st. The blue trace plots daily average inflows into the lake. Note that over this 37-day period, there have been times of negative inflow, primarily early in October. During these periods, only a trickle of water was entering the lake, while outflows and evaporation exceeded any inflow.

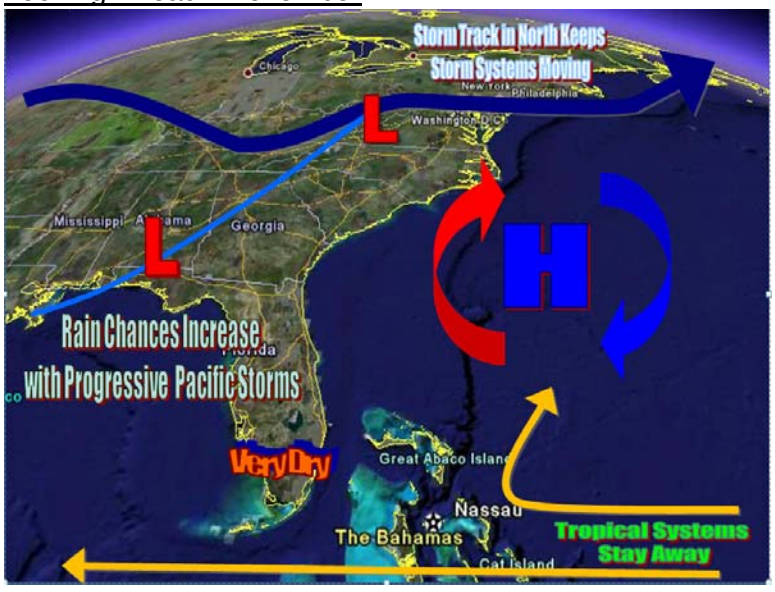



From October 23-25th, 1.19 inches of rain fell. This caused the spike in inflows for about a one-week period. These inflows peaked around 700 cfs before falling. The purple trace indicates the average inflow for October, while the yellow line is the historical average. Note how far the October inflow line is below the historical average line.

Even this period of enhanced inflow in late October did not near the historically average.

Based on the lack of any significant rain over the past two weeks, inflows again dropped off late in October and early in November and once again neared zero or even negative levels.

Looking Ahead - November



While November started out extremely dry across the Southeast U.S., mid and late November will see normal to even slightly above-normal precipitation. However, since November is normally a dry month, above-normal precipitation does not necessarily mean heavy rain amounts.

The next two weather systems have the potential for pockets of heavy rain in limited areas. Numerical weather models have been consistent in bringing Pacific storms into the southwest U.S. by mid November. A surface low is forecast to develop as the storm system marches east across Texas before reaching the Southeast U.S. This would result in a substantial inflow of moisture from the Gulf of Mexico into Alabama and Georgia.

Although the system appears to be moving rapidly, models are indicating a possible basin average of 1 to 2 inches of rain across north Georgia. The system then begins to move up the eastern U.S seaboard and develops into a substantial nor'easter for the Northeast U.S., with heavy snows and rain for that region.

After the storm system moves off, strong high pressure will once again usher in sunny skies and chilly temperatures. However, late in the cycle, the models forecast yet another low to develop by the third week of November. Is this a sign of our long-awaited weather pattern shift for the southeast U.S?

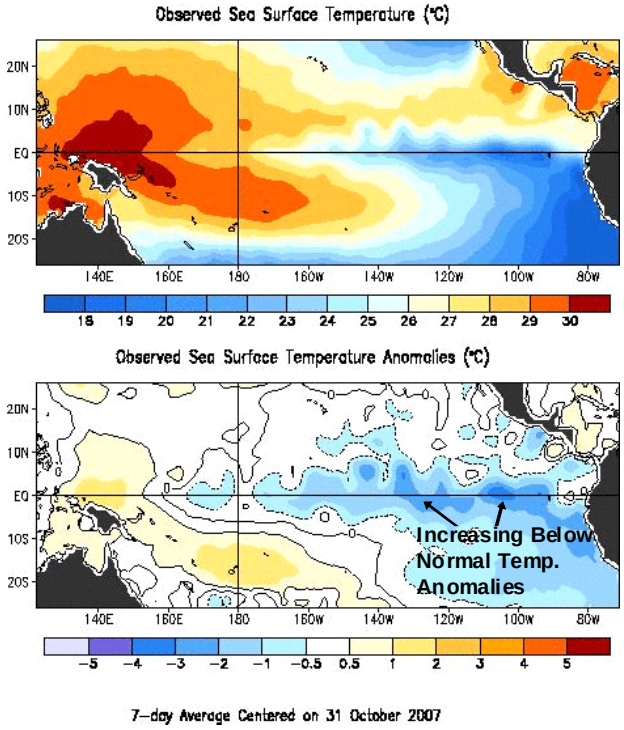
These systems typically develop starting in late December through February. It is unusual for these stronger systems this time of year. Therefore, we'll have to use caution in predicting heavy rain for North Georgia at this time.

Total basin average rain accumulations through the end of November will be 2 to 4 inches across north Georgia, which will be a welcome change. If this rain does occur, it likely will result in a week or two of enhanced inflows into Lake Allatoona. While it is not expected to raise lake levels by much, it could go a long way in the recharge of upper soil moisture.

Looking ahead towards the end of November and into December, dry conditions are once again forecast to take hold.

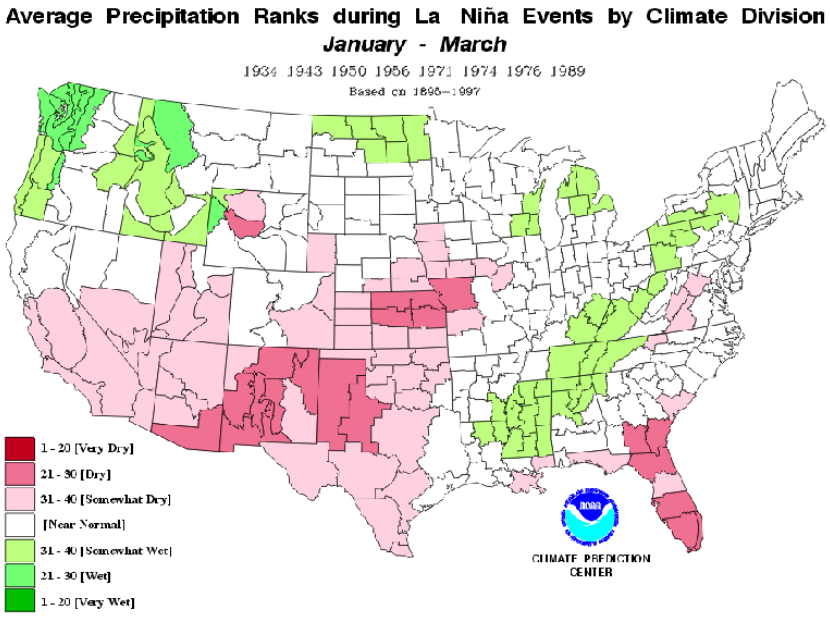
Longer-Term Outlook

The longer-term outlook provided by the Climate Prediction Center (CPC) is closely tied to the current La Nina conditions in the equatorial Pacific Ocean. As seen in the graphic below, below-normal temperatures across the Pacific support a moderate La Nina as temperatures continue to stay over 1.0 degree below normal for this time of year. The La Nina episode is forecast to continue at least through the end of the year, with a possible shift to neutral conditions as spring approaches.




La Nina doesn't typically have as strong a signal as El Nino in the Southeast. However, with a *moderate* La Nina, there *is* a stronger correlation. The average precipitation ranks for La Nina years are shown below and indicate the possibility of having above-normal rainfall for northern Mississippi, northern Alabama, and at least northwest Georgia. Below-normal precipitation is expected in Florida and South Georgia for the January-to-March time frame. Southwest Georgia and Northern Florida are starting in much better shape due to rainfall during the tropical season that left much of their rivers and soil moisture conditions near normal. Lake Okeechobee in south Florida continues setting record low levels, which will cause problems for many in South Florida.

Although forecasters are concerned about a potentially dry winter, there is some hope for those in the previously mentioned areas. The gradient between the forecast below-normal precipitation in South Georgia and above-normal in north Georgia is very tight. In addition, these statistics were taken using 8 La Nina events from 1896 to 1997, which is a small forecast sample size. However, they seem pretty consistent along the Appalachians corridor all the way into Mississippi.




Technical Discussion

The following graphs show the following: Maximum, Minimum, Distributed Standard Deviation, and the Distributed Mean values over a period of 45 days on one graphic. These values are computed and plotted for each day in the forecast period.

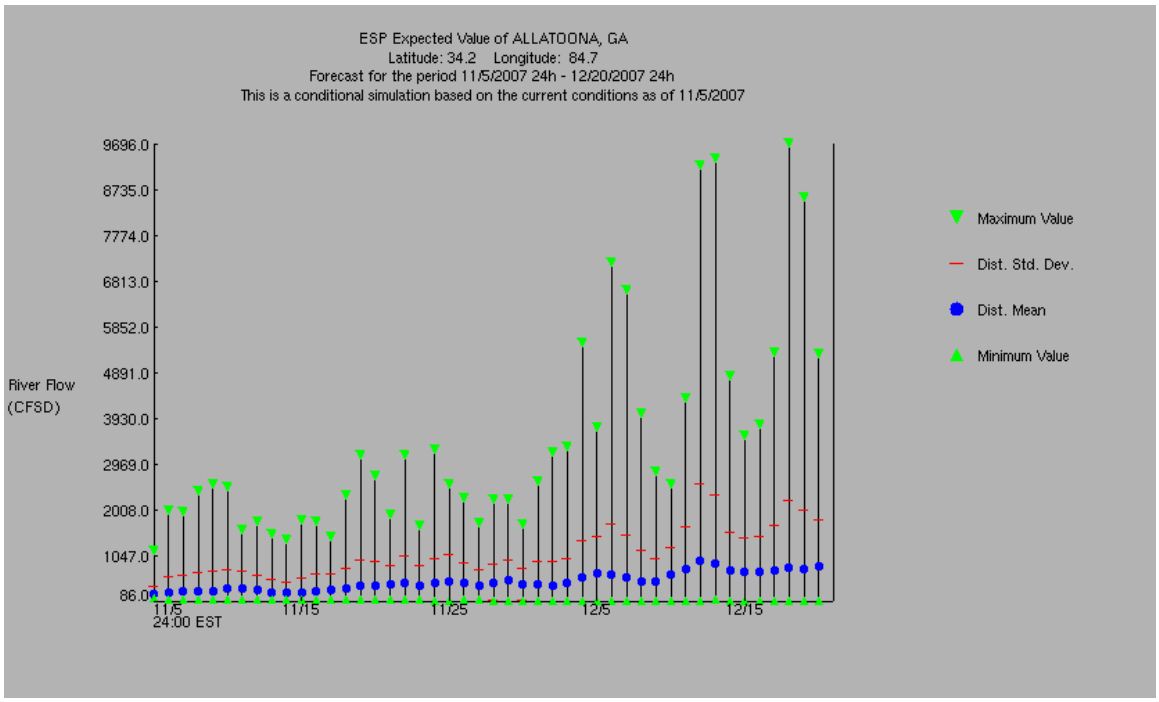
-The Maximum Value is the highest stage expected, based on recorded historical climate data as input to the hydrologic model, and on a basin's current conditions including soil moisture conditions.

-The Minimum Value is the lowest stage expected based on these same data and conditions.

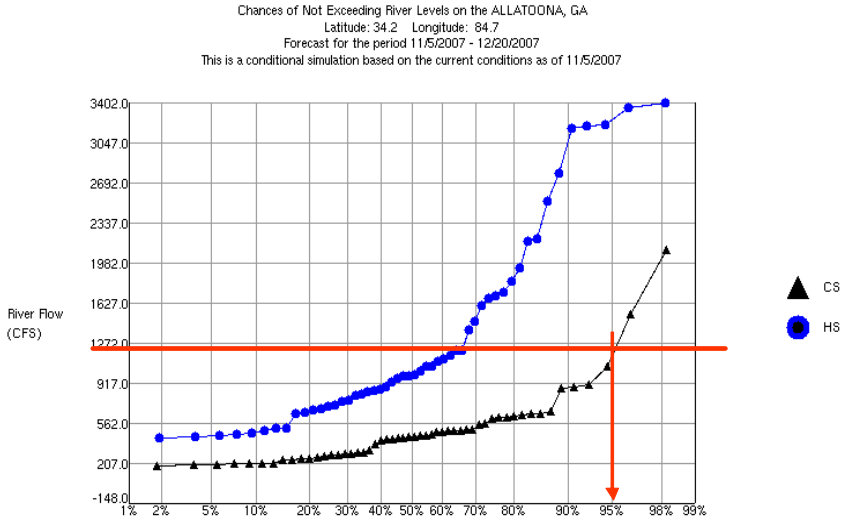
-The Distributional Mean can be interpreted as an average simulated stage for a given day produced by any of the yearly climate scenarios.

-The Distributional Standard Deviation provides confidence levels and defines a range within which approximately 68% of the simulated daily stage values are expected to fall.

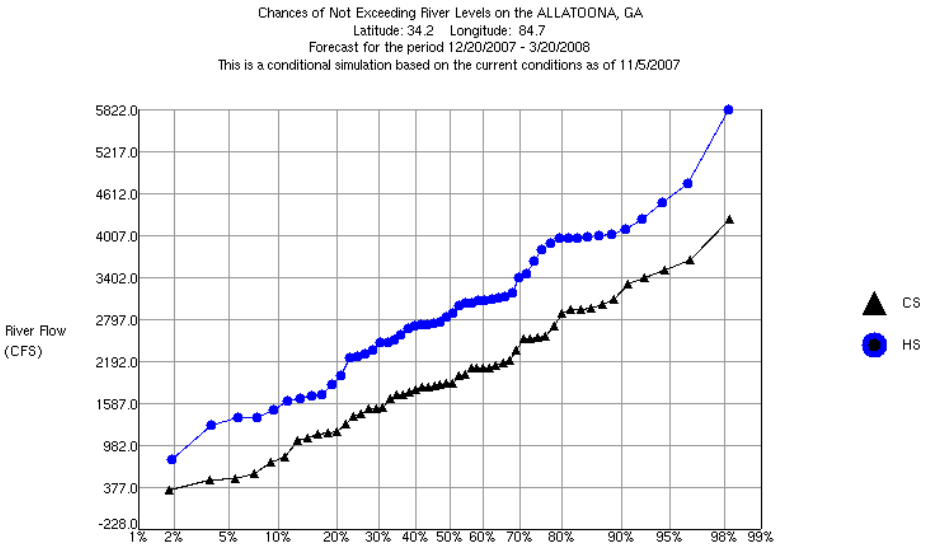
This graphic is for Lake Allatoona and shows expected values from November 5 to December 20. Notice how the range between the Max and Min values increase as December approaches. November is typically a pretty dry month climatologically in North Georgia. As winter approaches and frontal systems begin to move into the area, evaporation rates decrease, which makes runoff more likely from rainfall. All these factors increase the chance that rainfall is more likely during December and further into the winter months of 2008.




One other way to show how these changes are showing up in climatology is to look at nonexceedance probability plots for inflows to the same segments.




There is a 95% likelihood that average inflows (black line) will be less than normal (blue line) over the next 45 days.

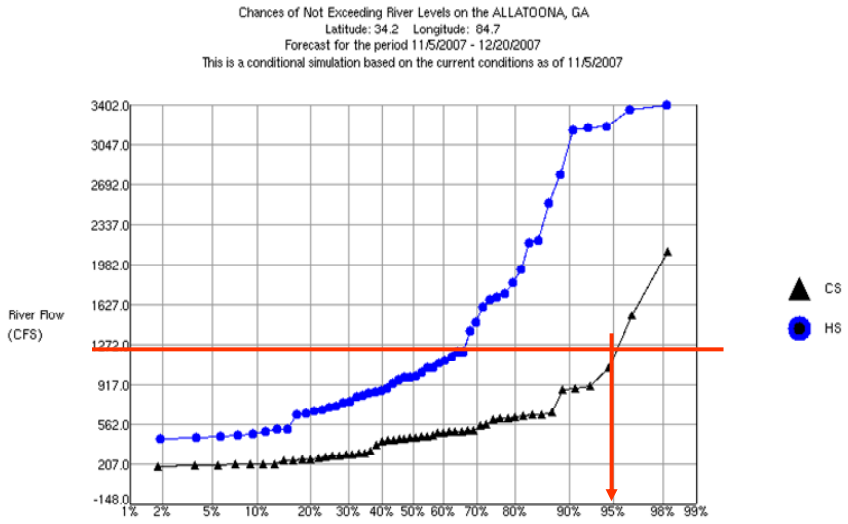



Both graphs show chances of not exceeding mean flow levels into Lake Allatoona reservoir with conditional and historical plots. The difference between the two graphs is that the top one is for the time frame from November 5th to December 20th, while the other is for the winter season from December 20th to March 20th, 2008. There are two trends to notice when comparing these two graphs:

1) In the top graph, which only encompasses 45 days, the *conditional* plot restarts each run with initial conditions on day 1 of the run (11/5) and then runs each of the 54 years to get a mean trace. The second graph initializes from the same day. However, the model then runs for 45 days (12/20), and then we begin using the output for the graph. In the top graph there is more separation between the conditional and historical plots than in the second graph. The reason for this is that initial conditions are so dry that the conditional plot initializes from the dry conditions and the historical tries to simulate what actually happened during that time. The second plot is less affected by initial conditions and therefore is edging toward climatology. This is the main reason we continue to look at a 45-day window for Ensemble Streamflow Prediction.

2) The flow level on the top of the vertical axis goes from about 3400 cfs to about 5800 cfs from the top to the bottom graph. This is also indicative of a climatological shift from the fall to the winter, which is typically our wettest time to the year. It is also the most likely time for recharge of the reservoirs.

One difference between Lake Allatoona and Lake Lanier is management of the lake. Allatoona has a summer pool of 840 ft which is lowered to 823 ft in December and January to help with flood control. Lake Lanier has a minimal drawdown due to the large capacity of the lake being utilized for flood control. This year, Allatoona did not have to draw down their pool to winter levels because of the dry Summer and Fall. The lake is already very near to its winter pool. The hope is that rainfall will make it possible to refill over the winter.




There is a 95% likelihood that average inflows (black line) will be less than normal (blue line) over the next 45 days.

Lake Allatoona is at an unusually low stage for this time of the year. However, an analysis of past years shows that it is likely that lake levels will rebound to some degree by spring.

This same analysis also shows that there have been drought years when this rebound was minimal or did not occur. In consideration of the already low levels, prudent conservation actions are warranted.

SERFC Water Watch Team: Jonathan Atwell, Todd Hamill, Brad Gimmestad, John Feldt, Rick Ullom, Nene Robertson, Jack Bushong, Joshua Palmer

For more information, contact Todd Hamill, John Feldt, or Brad Gimmestad at (770) 486-0028 ext. 1.