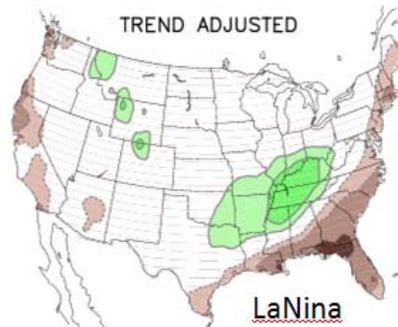


December 13, 2010 *Weekend Rain Summary*

As has been the case since this past fall, the axis of heaviest rain extended from the northern half of Alabama across north Georgia into the far western Carolinas this past weekend. The image below is a summary of this past rain event. Pockets of green indicate rainfall from 0.75 to a little over an inch. Shades of blue indicate an average of 0.25 to 0.50 inches. Once again, southeast Georgia and most of the Florida Peninsula did not receive any significant rainfall.



So, is this the development of the much discussed LaNiña pattern (bottom right)? During a strong LaNiña winter rainfall would be expected to be well below normal over eastern and southern sections of our area and above normal to the north. While many associate dry weather over the southeast U.S. with a LaNiña winter, it is often not recognized that northern Alabama, Georgia, and the far western Carolina can experience above normal rainfall.

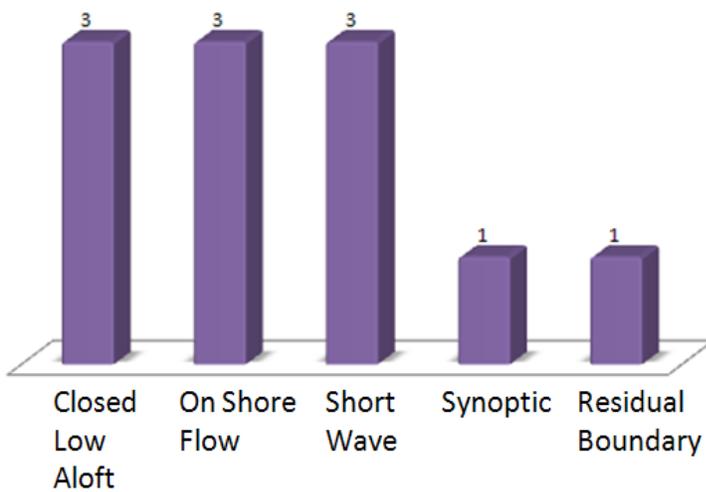
Could the weekend rain reflect this LaNiña pattern? It is hard to say. Take a look at normal December rainfall (above right). You can see that heavier rainfall typically does occur in this area in December compared with areas further east and south. Thus, this weekend event is perfectly "normal" for this time of year.

Let's take a closer look at the rain-producing weather systems that impacted the Southeast U.S. this past November, as classified in the SERFC WHMR data base.

November is usually a transition month, typically fairly quiet, with occasional severe weather associated with early pushes of cold air as well as some late-season tropical activity.

November 2010 did see a fairly low number of overall systems (11) which would be expected. Note that we experienced an assortment of hydromet systems, mainly closed low aloft, on-shore flow, and short waves.

November 2010 Hydromet Classification



These three primary classifications can be aligned with the overall seasonal transition. Closed lows aloft are usually considered winter system. Short waves can occur anytime of the year and on shore flow is often considered tropical.

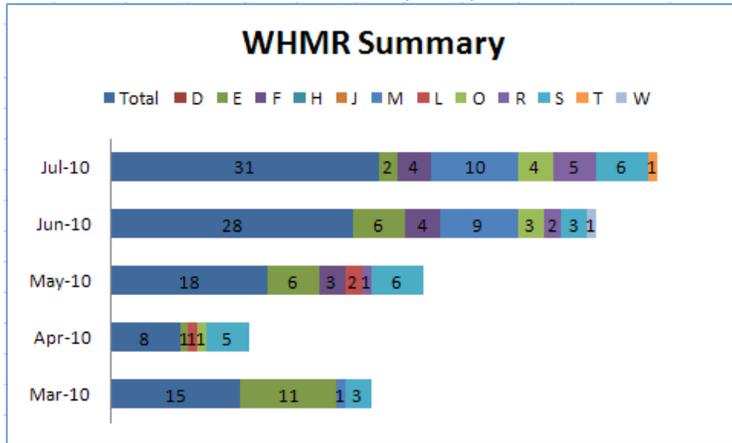
Thus, November 2010, from an event classification, found a mix of classifications. As we move through December we might expect a higher number of overall systems perhaps with more of a consistency of winter-like patterns.

Here is a glimpse into a new initiative at the SERFC, led by hydrometeorologist Joshua Palmer. It is called the Weekly Hydrometeorological Review (WHMR). The WHMR is an

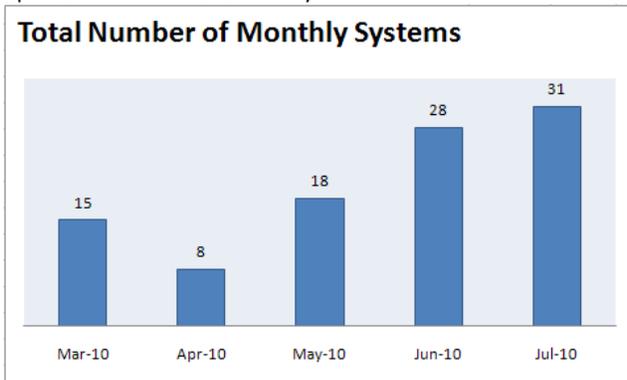
analysis of each weather system that impacts the Southeast U.S. The WHMR currently classifies each weather system for three main parameters: a main classification, a location classification, and a precipitation type classification. We hope that the WHMR will help us better understand precipitation-producing weather systems over our area and build a historical database for future analysis and research.

Following is one type of analysis from the WHMR database. This shows the distribution of specific events, by month, from March through July 2010. Each of the codes stands for the dominating weather pattern most directly responsible for the associated precipitation.

E=Closed Low Aloft / F=Long Wave-Synoptic / M=Warm Season Mesoscale / O=On Shore Flow / S=Short Wave / T=Tropical Cyclone



The following chart shows the total number of systems each month, with a low of 8 in April to a maximum of 31 in July.

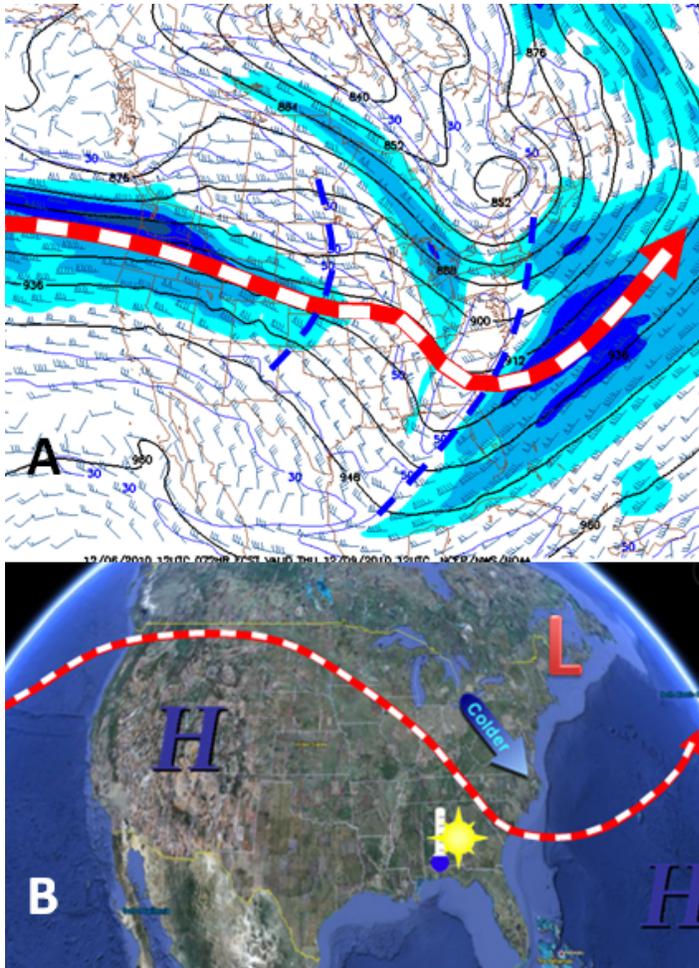


The WHMR has the potential to provide valuable insight into the hydrometeorological systems that impact our region. Expect to see a lot more of this data in the near future.

December 6, 2010 *The Week Ahead – Mostly Dry*

This first full week of December will find a continuation of a fast northwest upper flow (A). Smaller waves of energy (blue dashed lines) will rotate through this flow and result in an occasional chance of rain. The spacing interval of these rain events will be every 5 days, more or less, with the next event not until the weekend.

Southeast River Forecast Center
Peachtree City, Ga.



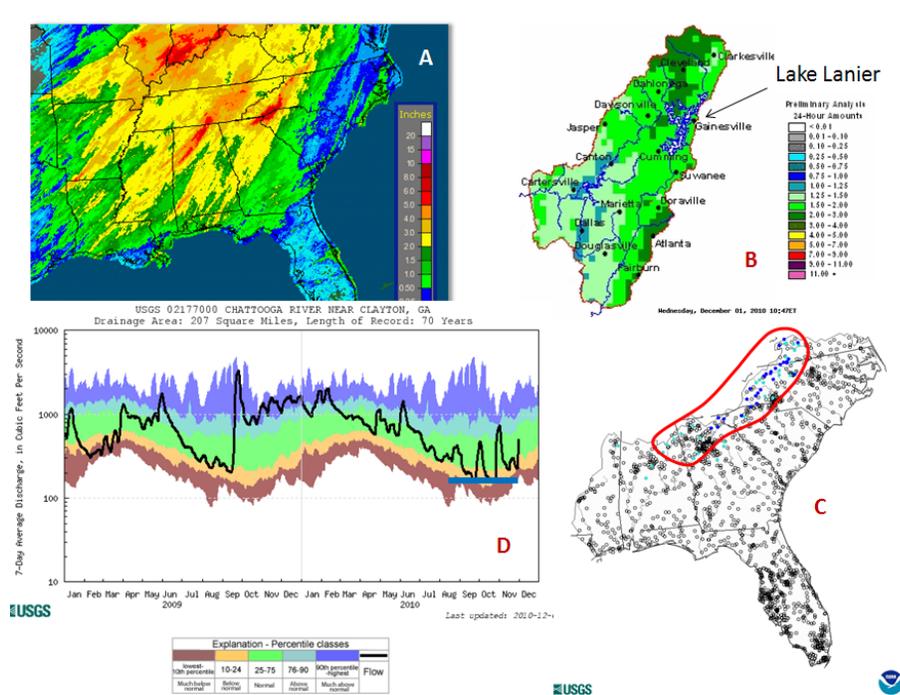
This pattern of a ridge of high pressure over the western U.S. (B) and low pressure over the east looks like it will last into mid December. This flow regime will hold down rain amounts as each system moves through rapidly and consequently limits available moisture. It will also result in continued below-normal temperatures.

Each rain event looks like amounts will only average from 0.25 to 0.50 inches or so, with heaviest amounts over far northern Alabama, Georgia, and the Carolinas. Heading into mid December, rainfall should average from normal- to below-normal in this region, and well-below-normal further south.

December 1, 2010 *Rainfall Event Summary*

The precipitation event over the past several days resulted in significant water resources recharge over much of Alabama, North Georgia, and the far western Carolinas. Areas of yellow (A) denote rainfall of 2 inches or more with the small streaks of red indicating 5 inches. Significant rain fell over the Lake Lanier drainage (B). Much of the basin upstream of Lake Lanier received 2 to 4 inches of rain. This will enhance inflows into the lake and likely result in an increase in lake elevation. Lake Lanier is currently about 3 feet below full pool, but about 5 feet above normal for this time of the year.

Southeast River Forecast Center
 Peachtree City, Ga.



Runoff from this rain event did cause within-bank rises on many rivers, however only a small number exceeded flood stage. Several small headwaters near Atlanta will experience rises near or slightly above flood stage. Blue dots (C) show stream flow well above normal. This area outlined in red corresponds well with the area of heaviest rainfall.

A USGS duration hydrograph (D) from the area of heaviest rain show that many streams were starting to see the impact from reduced fall rainfall. Note that stream flow had been trending below seasonal normal levels (dark blue horizontal line) recently. You can already see some response with levels back into the normal range (green shaded region).

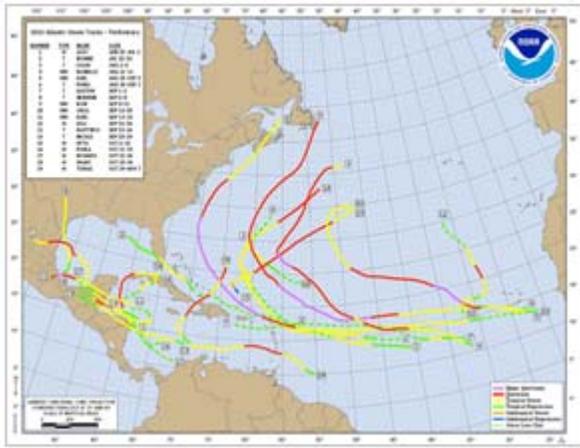
Keep in mind that evapotranspiration (ET) has been significantly reduced. This time of the year only about 0.07 inches of moisture is lost each day due to ET. Thus, much of this rainfall will serve to recharge soil moisture and/or enhance interflow into streams.

November 30, 2010 *Extremely Active Atlantic Hurricane Season – but not for U.S.*

According to NOAA the 2010 Atlantic hurricane season, which ends tomorrow, was one of the busiest on record. In contrast, the eastern North Pacific season had the fewest storms on record since the satellite era began.

In the Atlantic Basin a total of 19 named storms formed – tied with 1887 and 1995 for third highest on record. Of those, 12 became hurricanes – tied with 1969 for second highest on record. Five of those reached major hurricane status of Category 3 or higher.

These totals are within the ranges predicted in NOAA's seasonal outlooks issued on May 27 (14-23 named storms; 8-14 hurricanes; 3-7 major hurricanes) and August 5 (14-20 named storms; 8-12 hurricanes; 4-6 major hurricanes). An average Atlantic season produces 11 named storms, six hurricanes and two major hurricanes.



2010 track map for the Atlantic Basin.

Large-scale climate features strongly influenced this year's hurricane activity, as they often do. This year, record warm Atlantic waters, combined with the favorable winds coming off Africa and weak wind shear aided by La Niña energized developing storms. The 2010 season continues the string of active hurricane seasons that began in 1995.

But short-term weather patterns dictate where storms actually travel and in many cases this season, that was away from the United States. The jet stream's position contributed to warm and dry conditions in the eastern U.S. and acted as a barrier that kept many storms over open water. Also, because many storms formed in the extreme eastern Atlantic, they re-curved back out to sea without threatening land.

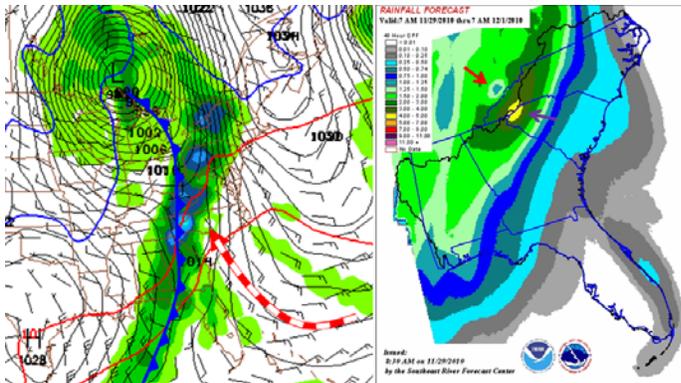
Other parts of the Atlantic basin weren't as fortunate. Hurricane Tomas brought heavy rain to earthquake-ravaged Haiti, and several storms, including Alex, battered eastern Mexico and Central America with heavy rain, mudslides and deadly flooding.

November 29, 2010 *Keep an Eye on Higher Elevations of the Carolinas*

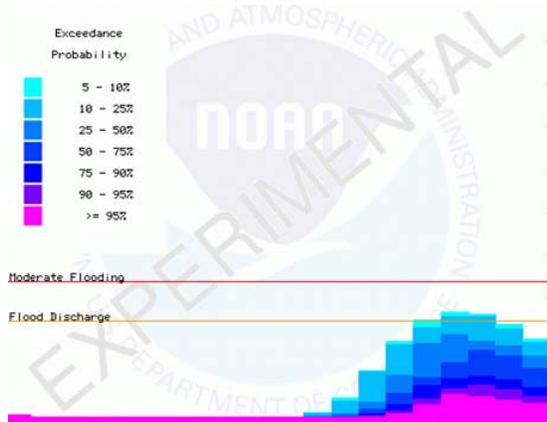
The next rain event will arrive tonight through Wednesday over the Southeast U.S. The SERFC is forecasting a widespread inch or two of rain with amounts of three inches or more over a small portion of western North and South Carolina.

SERFC Forecaster Insight:

Inflow of moisture will be from the Atlantic (below left red/white jet). This will focus the transport of low level moisture over higher elevations of the Carolinas. This mountainous region will provide the needed lift to enhance rainfall amounts. Note the highest amounts of nearly four inches (yellow/purple arrow). The red arrow points out an area of lower rainfall. This is due to subsidence, or downward motion, on the leeward side of the mountains.



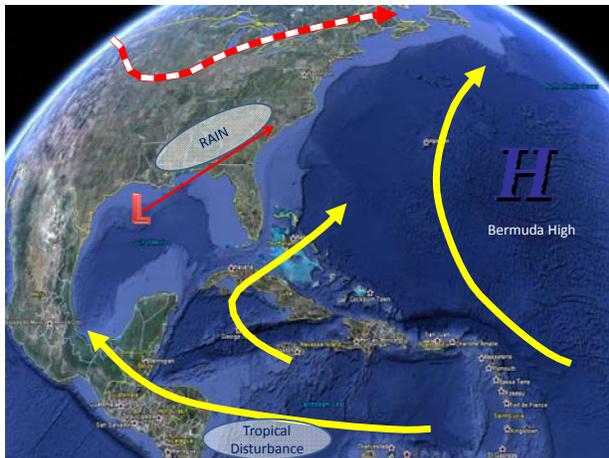
Synoptic (or larger scale) energy will be well to the north of our area, thus rainfall tapers off further south. Rainfall over Alabama and Georgia will be caused by lift from a passing cold front. You might remember that many late summer/early fall rain events saw an area of low pressure develop in the Gulf of Mexico and enhance rainfall over southern sections of Alabama and Georgia. This will not be the case with this rain event and consequently rain will be less in these areas.



Above is one of the SERFC ensemble models for a headwater point on the Roanoke River in Virginia. This gives us some early estimate on a rivers potential response to the forecast rainfall. Currently, this shows that there is about a 25% chance that some of the headwaters could reach flood stage due to forecast rainfall. Of course, the rainfall forecast is likely to change somewhat over the next day or two, which could alter these outlooks.

November 16, 2010 *Mid November Hydromet Outlook*

We are in the period of time when the Southeast U.S. could still be impacted by a tropical system (unlikely) or a late fall synoptic system (more likely). The following image shows potential tropical tracks (yellow) and the general synoptic flow (red) through the end of November.



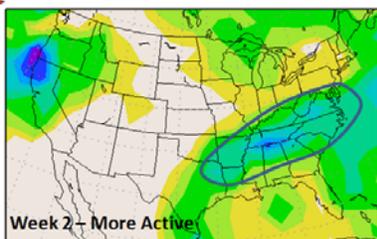
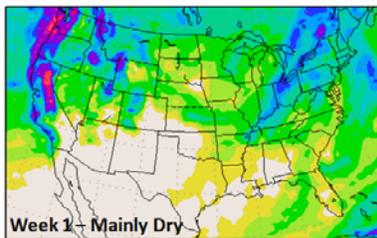
Key Hydrometeorological Factors for Mid & Late November (Jack Bushong)

If late season tropical systems do develop, they are unlikely to impact the Southeast U.S.

The jet stream across the northern U.S. will continue to dip into the Central Plains from time to time before moving toward the east. As the jet stream dips toward the Southeast U.S., surface lows could develop in the Gulf of Mexico and transport rainfall into the area. We could see several of these types of systems towards the end of the month.

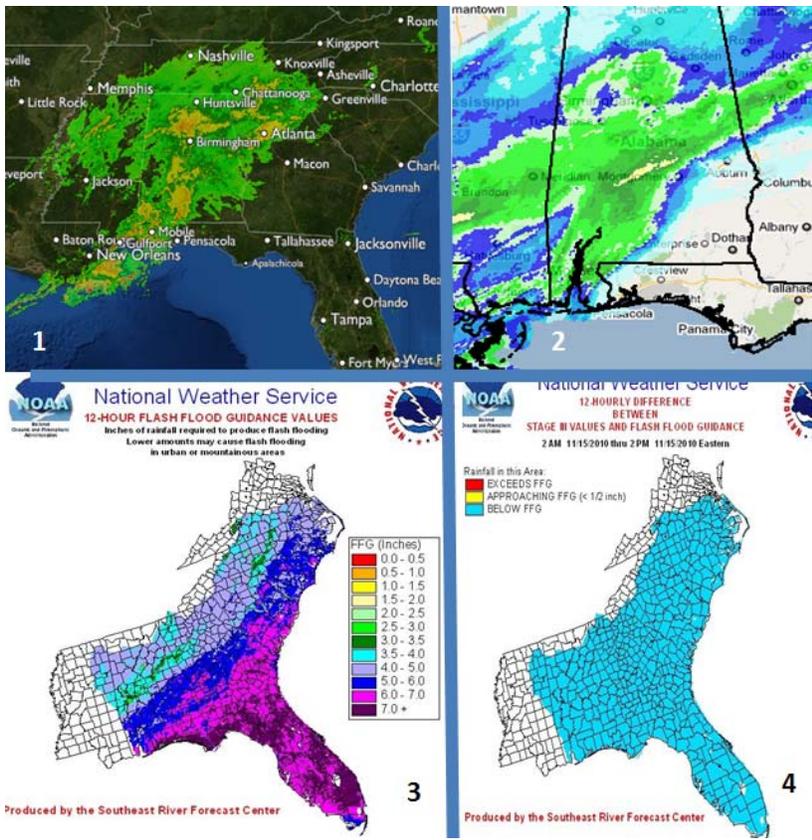
Expect a week-long dry period after this current rain event with the next rain-producing system arriving towards Thanksgiving.

Precipitation Forecast



November 15, 2010 *Welcome Rain or Potential for a Flood?*

As of this morning a widespread swath of rain covered Alabama, much of Georgia, and Northwest Florida (figure 1). In figure 2, the area in green indicates rainfall over the past 12 hours of 1.0 to 2.5 inches with the small area of yellow around 3 inches.



The SERFC hydrologic model calculates how much moisture is stored in upper soils. This time of the year, with colder temperatures and after leaves drop, evapotranspiration is greatly reduced and soils can hold moisture longer.

Figure 3 indicates 12-hour flash flood guidance values. This index is used to provide a general idea of how much rain it would take, over a defined period of time, to produce enough runoff to result in flooding. I find this a useful tool to estimate the balancing point between needed rainfall and the potential for flooding. So, you can see that northern Alabama and Georgia and the western Carolinas can take about 3 or 4 inches of rain before flooding is of concern. Or, another way to state it, the first 3 inches of so or rain would be of benefit as seasonal recharge. Figure 4 shows the latest difference between the flash flood guidance value and the latest rainfall for the same period. Blue shows that the current rainfall totals are lower than the flash flood value. Thus, for most areas, this week's rain event has been more of a benefit than a flood event.