

## MEMORANDUM

TO: Governing Board

FROM: Megan Wetherington, P.E., Senior Professional Engineer

THRU: Ann B. Shortelle, Ph.D., Executive Director  
Erich Marzolf, Ph.D., Water Resources Division Director

DATE: May 13, 2013

RE: April 2013 Hydrologic Conditions Report for the District

### RAINFALL

- Average rainfall in the District was 3.86", which is 117% of the long-term April average of 3.29". (Table 1, Figure 1). Rainfall distribution favored northern counties (Figure 2), continuing a pattern that began in November 2012. Overall, southern counties saw near-normal average totals but interior portions of Levy County and western Alachua County were still lower than normal. Usher Tower near Chiefland in Levy County reported the lowest January-April total since record-keeping began in 1956. The highest gaged monthly total was 7.85" at Sneads Smokehouse Lake in Jefferson County, while the lowest was 2.23" at Union Tower near Lake Butler. The highest daily total was 2.92" at Cabbage Grove Tower in Taylor County. Rainfall in the Okefenokee Swamp (headwaters of the Suwannee River) was much above normal (Figure 3).
- Average rainfall for the 12 months ending April 30 was 8.88" higher than the long-term average of 54.61" (Figure 4). Figure 5 shows the history of rainfall deficits beginning in 1932.

### SURFACEWATER

- **Rivers:** Levels on the Suwannee River and its Georgia tributaries were stable throughout April, staying in a range considered normal for the time of year. Santa Fe River gages fell steadily but most ended the month with normal flows, except for the Santa Fe near Fort White which had below-normal flows. The Aucilla River stayed above the 75<sup>th</sup> percentile throughout the month, higher than normal for the season. Other coastal rivers stayed in a normal range. Statistics for a number of rivers are presented graphically in Figure 6, and conditions relative to historic conditions are in Figure 7.

On April 25<sup>th</sup>, the Florida Department of Health issued an advisory warning people to avoid contact with the Withlacoochee and Suwannee rivers after a sanitary sewer main burst near Valdosta, causing untreated wastewater to flow into the Withlacoochee River. The release started on the 24<sup>th</sup> and was fixed by the 26<sup>th</sup> by Lowndes County. The advisory was withdrawn on May 2<sup>nd</sup> after testing by the Florida Department of Environmental Protection showed the Withlacoochee met state water quality standards. The spill occurred two months after river flooding caused the failure of Valdosta's sewage treatment plant, resulting in the release of untreated sewage into the river. Subsequent tests also met state standards.

- **Lakes:** Monitored lakes generally remained stable in April. Most had levels near their long-term average. Governor Hill Lake in northern Dixie County, which was dry for 6

years until the tropical storms last summer, continued to fall, while Waters Lake in Gilchrist County remained dry for the sixth consecutive year. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for a number of monitored lakes.

## SPRINGS

Troy and Lafayette Blue Springs on the middle Suwannee remained closed to swimmers and divers due to high river levels inundating the springs. The Suwannee River flowed into White Sulfur Springs for the 10<sup>th</sup> consecutive week. The Alapaha Rise, one of the largest single-sourced springs in the state, was measured at its second highest flow since 1998 (800 cubic feet per second or over 500 million gallons per day). Statistics for a representative sample of springs are shown in Figure 9.

## GROUNDWATER

Over half of District upper Floridan aquifer monitor wells had levels in a range considered normal based on records starting in the mid-1970s. Thirty percent were in a range considered high. Levels rose in wells in the northern half of the District, except for areas near the Withlacoochee and Alapaha rivers, where levels dropped after being influenced by river flooding in March. Levels in the southern, drier half of the District continued to fall. Levels District-wide rose from the 58<sup>th</sup> to the 65<sup>th</sup> percentile. Wells in the vicinity of northern and western Alachua County fell to the 18<sup>th</sup> percentile. Statistics for a representative sample of wells are shown in Figure 11. Statistics for a number of regional long-term wells are shown in Figure 12 along with a description of aquifer characteristics.

## HYDROLOGICAL/METEOROLOGICAL/WATER USE INFORMATION

- The Palmer Drought Severity Index (PDSI), a climatological tool produced by the National Climatic Data Center, evaluates the severity and frequency of abnormally dry or wet weather using precipitation, temperature, and soil moisture data. The PDSI value for the week ending May 4 indicated slightly wet conditions in north Florida and moderately wet conditions in south central Georgia.
- The National Weather Service Climate Prediction Center (CPC) three-month outlook indicated equal chances of above-normal or below-normal precipitation through July. Neutral El Niño/Southern Oscillation conditions are expected through the summer.
- The U.S. Drought Monitor showed moderate drought to severe drought in parts of Gilchrist, Levy, and Alachua counties.

## CONSERVATION

A Phase I Water Shortage Advisory remains in effect. Users are urged to eliminate unnecessary uses. Landscape irrigation is limited to twice per week between March and November based on a water conservation rule that applies to residential landscaping, public or commercial recreation areas, and public and commercial businesses that aren't regulated by a District-issued permit.

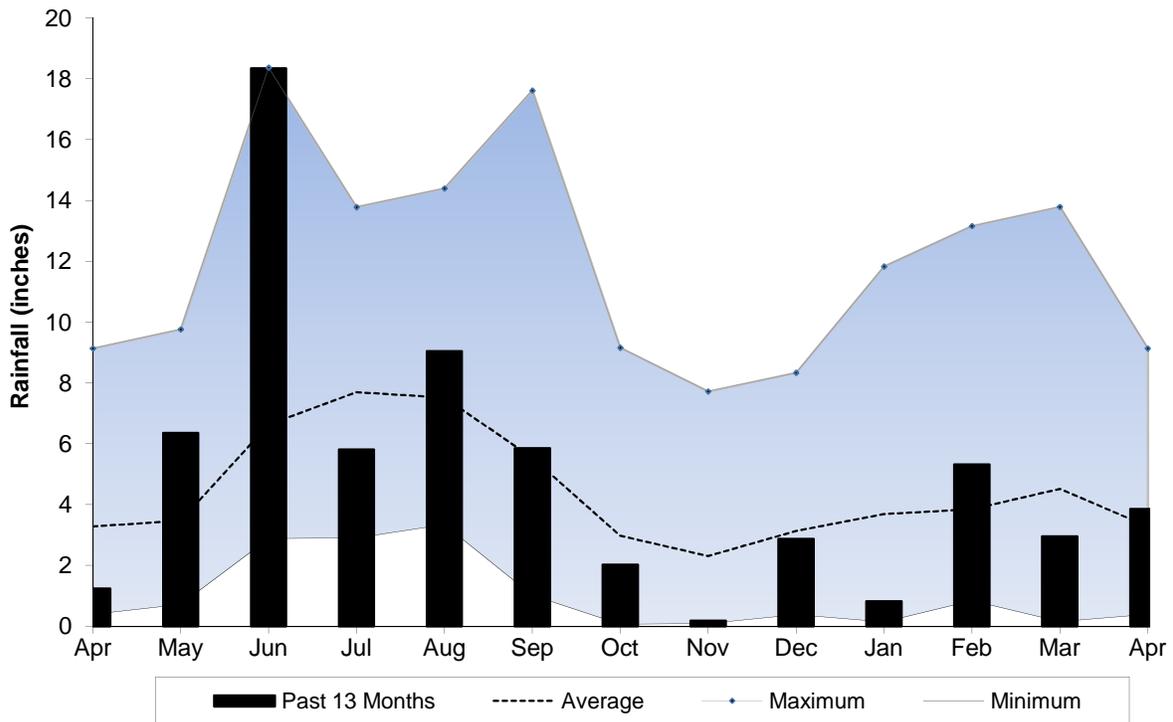
*This report is compiled in compliance with Chapter 40B-21.211, Florida Administrative Code, using rainfall (radar-derived estimate), groundwater (105 wells), surfacewater (35 stations), and general information such as drought indices and forecasts. Data are provisional and are updated as revised data become available. Data are available at [www.mysuwanneeriver.com](http://www.mysuwanneeriver.com) or by request.*

**Table 1: Estimated Rainfall Totals**

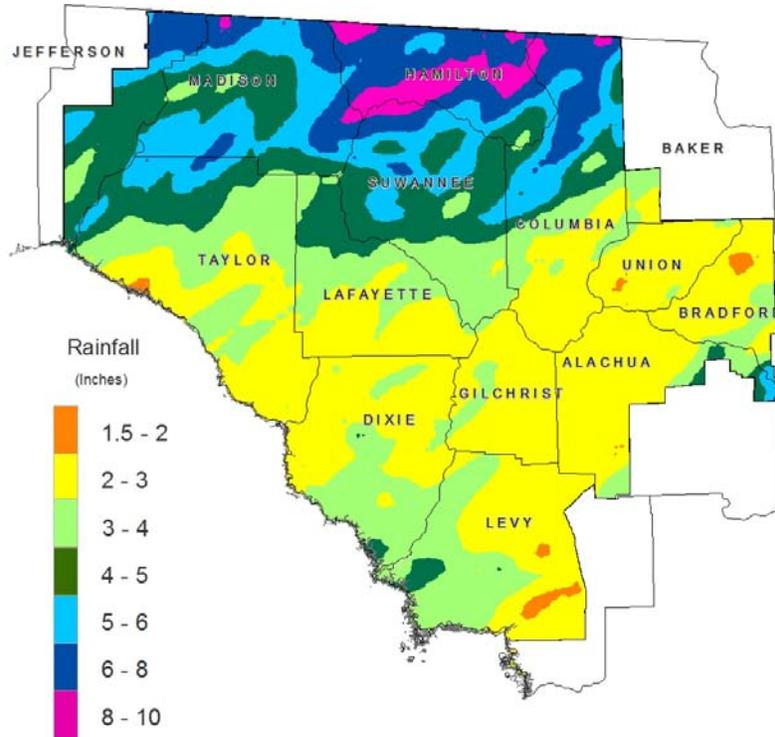
County	Apr 2013	April Average	Month % of Normal	Last 12 Months	Annual % of Normal
Alachua	3.25	3.35	97%	59.34	116%
Baker	3.65	3.07	119%	64.61	129%
Bradford	2.68	3.16	85%	63.08	124%
Columbia	4.48	3.10	144%	69.87	136%
Dixie	2.96	3.35	88%	58.44	99%
Gilchrist	2.69	3.58	75%	58.21	102%
Hamilton	7.11	3.21	222%	61.47	118%
Jefferson	4.80	4.04	119%	58.89	97%
Lafayette	3.21	3.24	99%	75.60	134%
Levy	2.82	3.11	91%	55.67	93%
Madison	5.38	3.23	167%	61.67	110%
Suwannee	4.69	3.24	145%	74.90	141%
Taylor	3.52	3.35	105%	67.36	113%
Union	2.48	3.65	68%	61.07	113%

April 2013 Average: 3.86  
 April Average (1932-2012): 3.29  
 Historical 12-month Average (1932-2012): 54.61  
 Past 12-Month Total: 63.49  
 12-Month Rainfall Surplus: 8.88

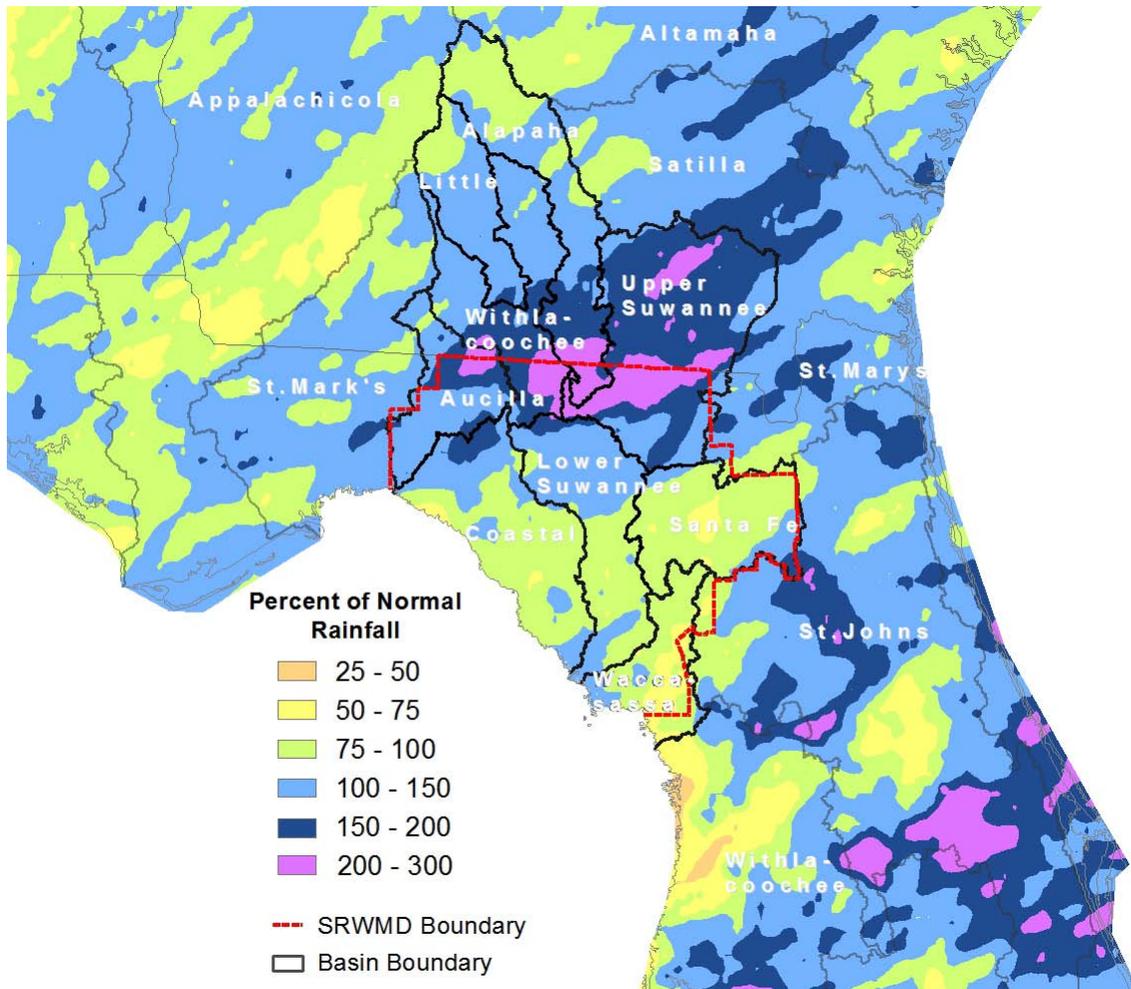
**Figure 1: Comparison of District Monthly Rainfall**



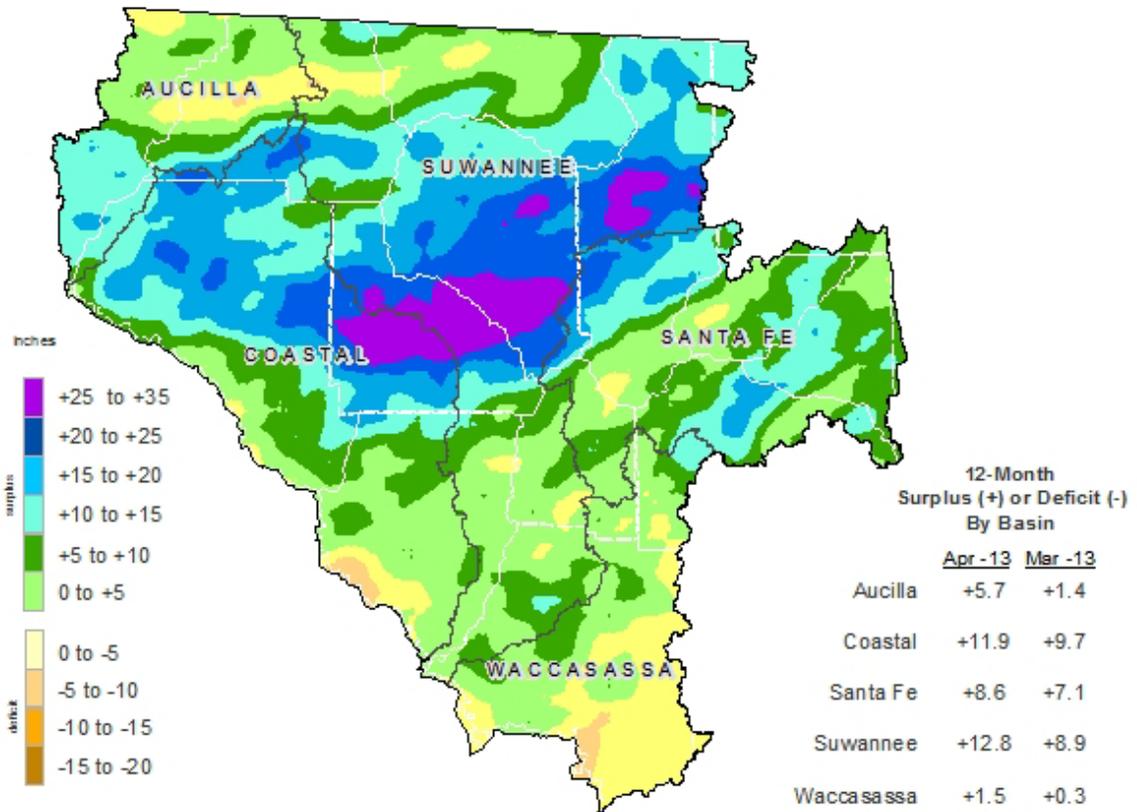
**Figure 2: April 2013 Rainfall Estimate**



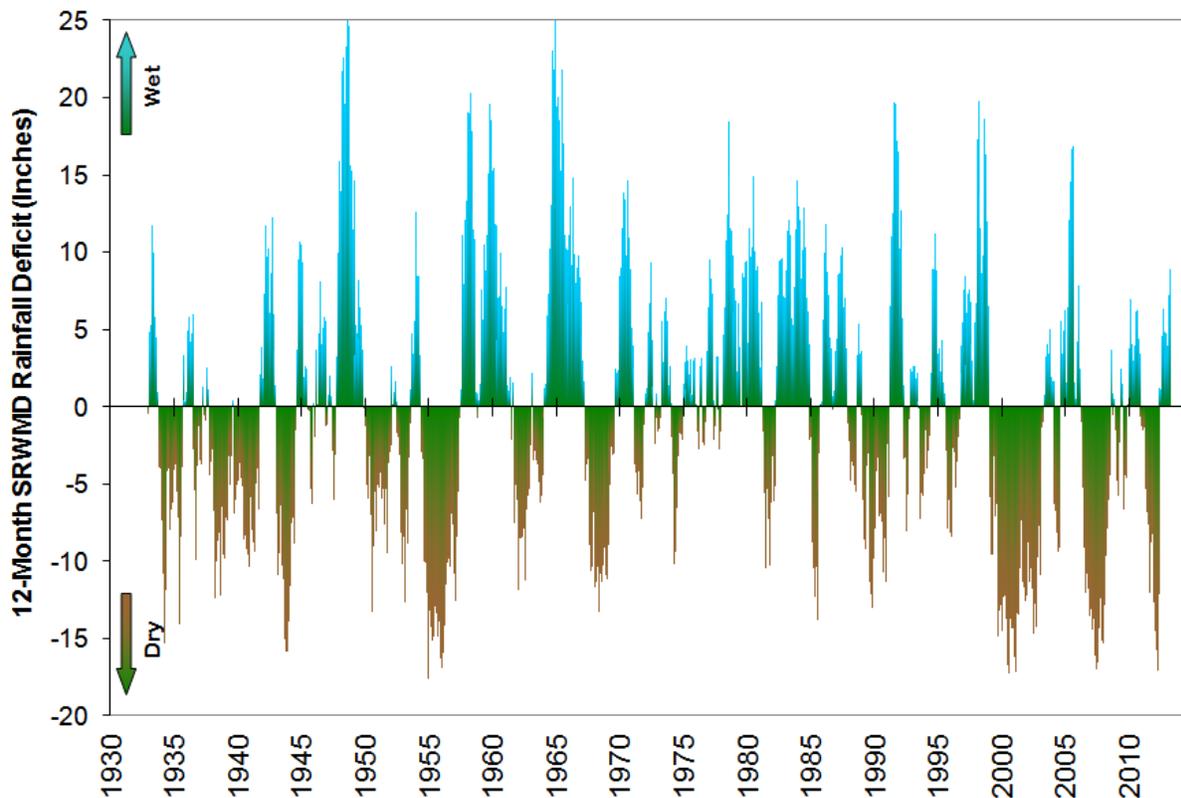
**Figure 3: April 2013 Percent of Normal Rainfall**



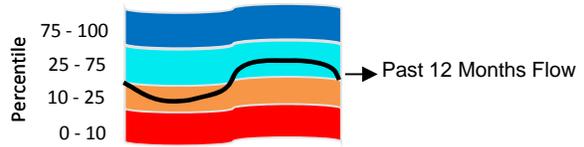
**Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin Through April 30, 2013**



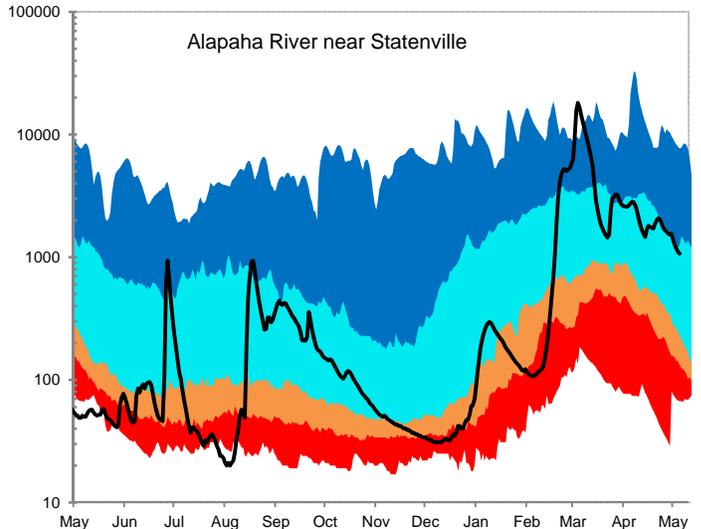
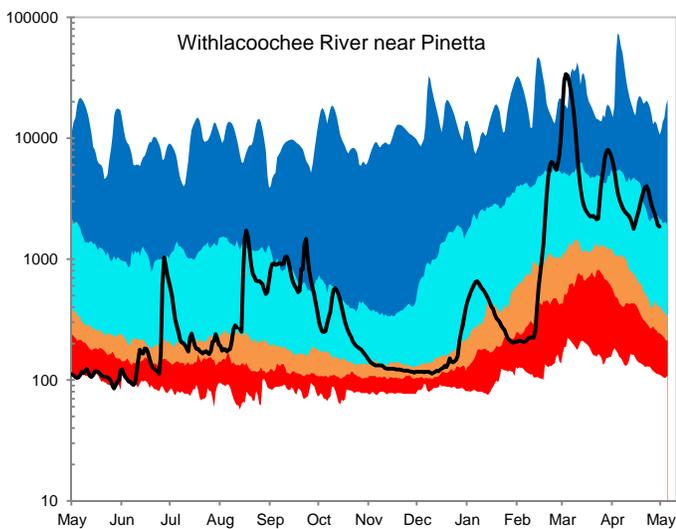
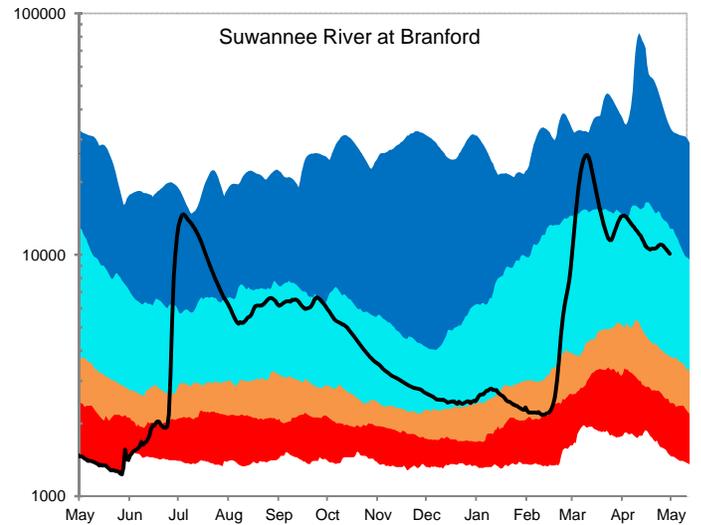
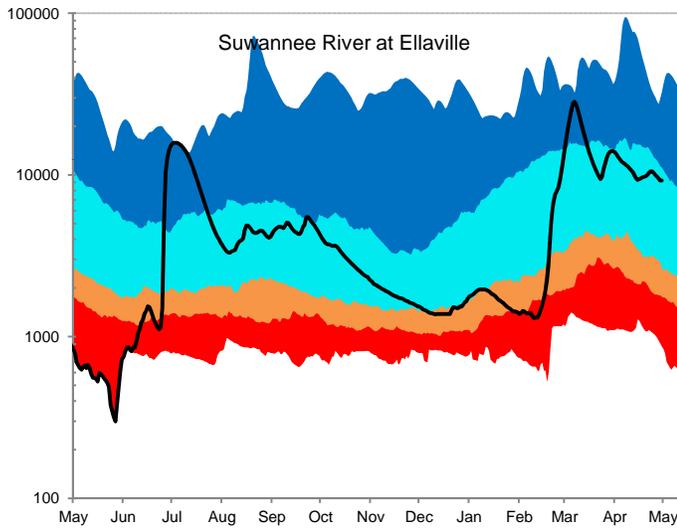
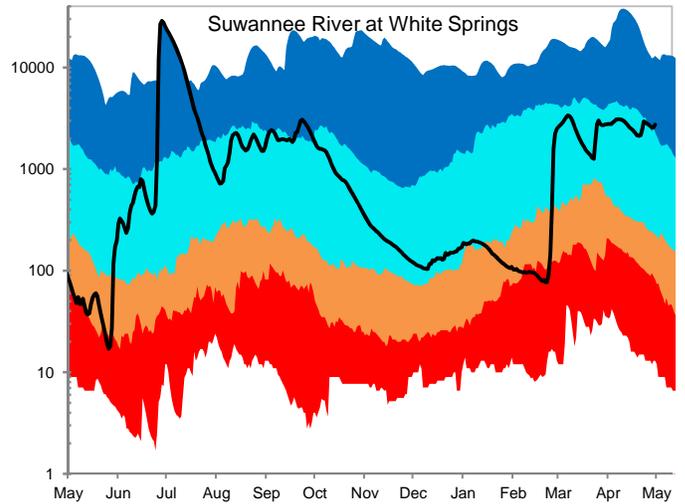
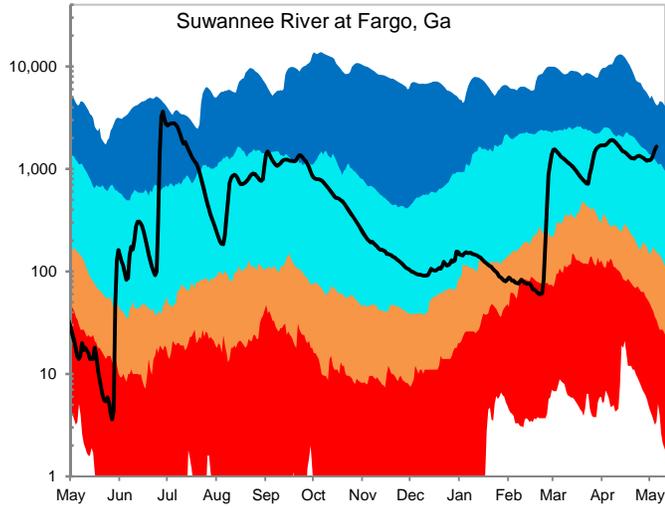
**Figure 5: 12-Month Rolling Rainfall Deficit Since 1932**



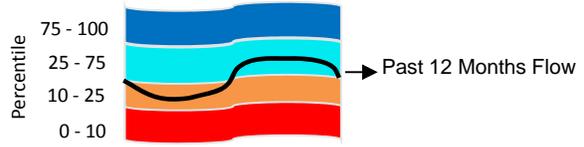
**Figure 6: Daily River Flow Statistics**  
 May 1, 2012 through April 30, 2013



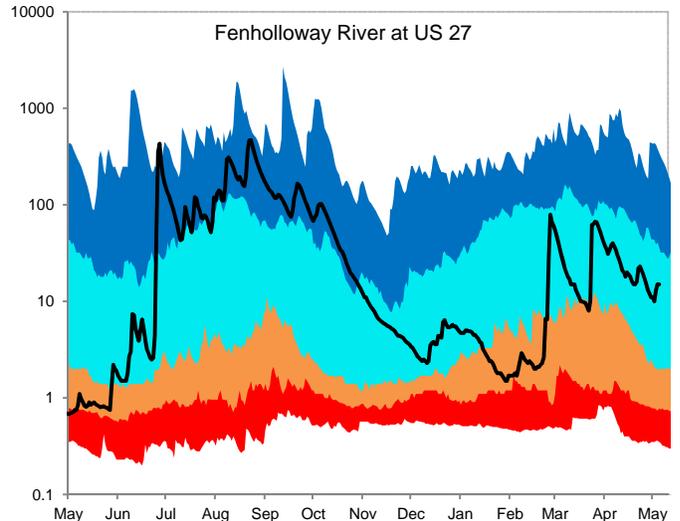
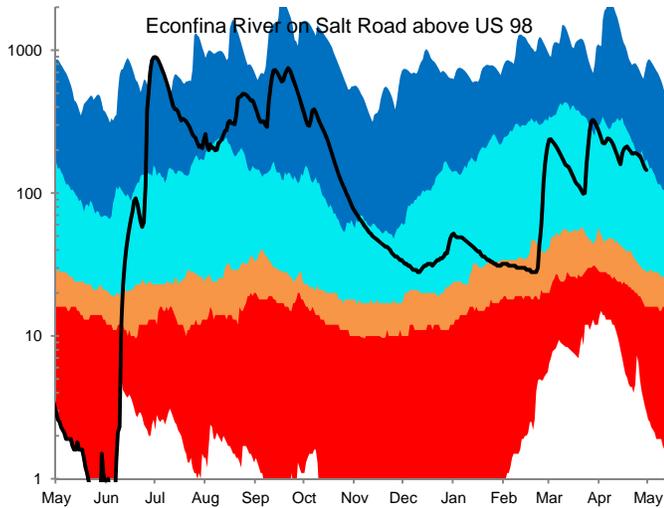
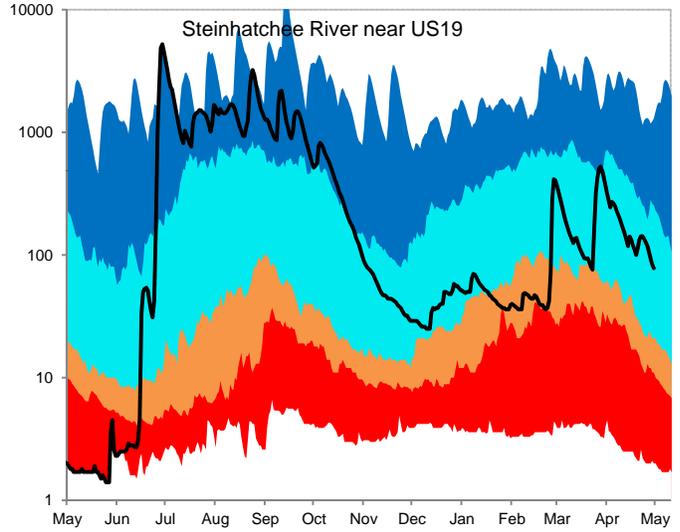
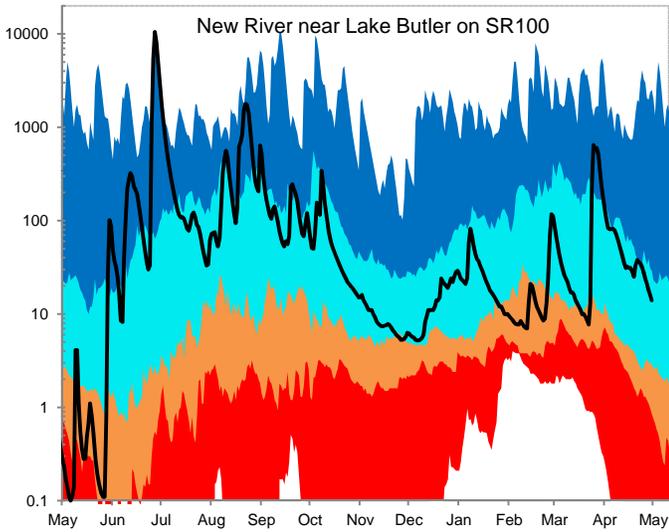
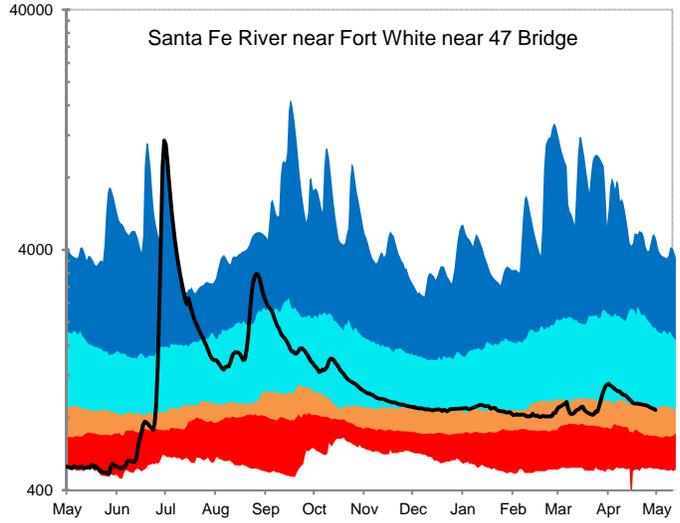
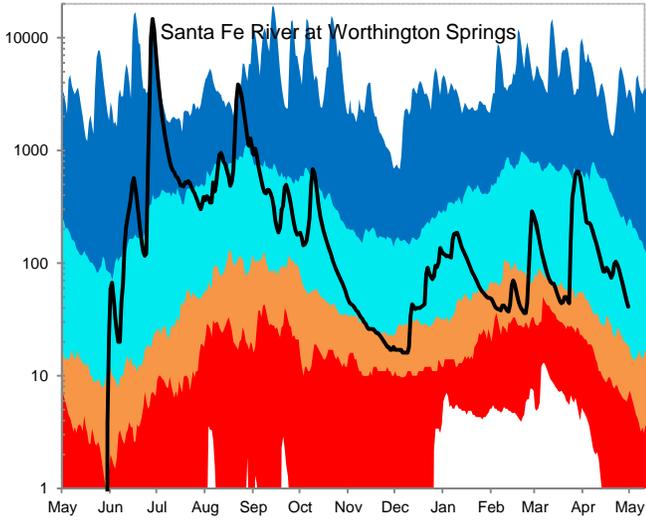
RIVER FLOW, CUBIC FEET PER SECOND

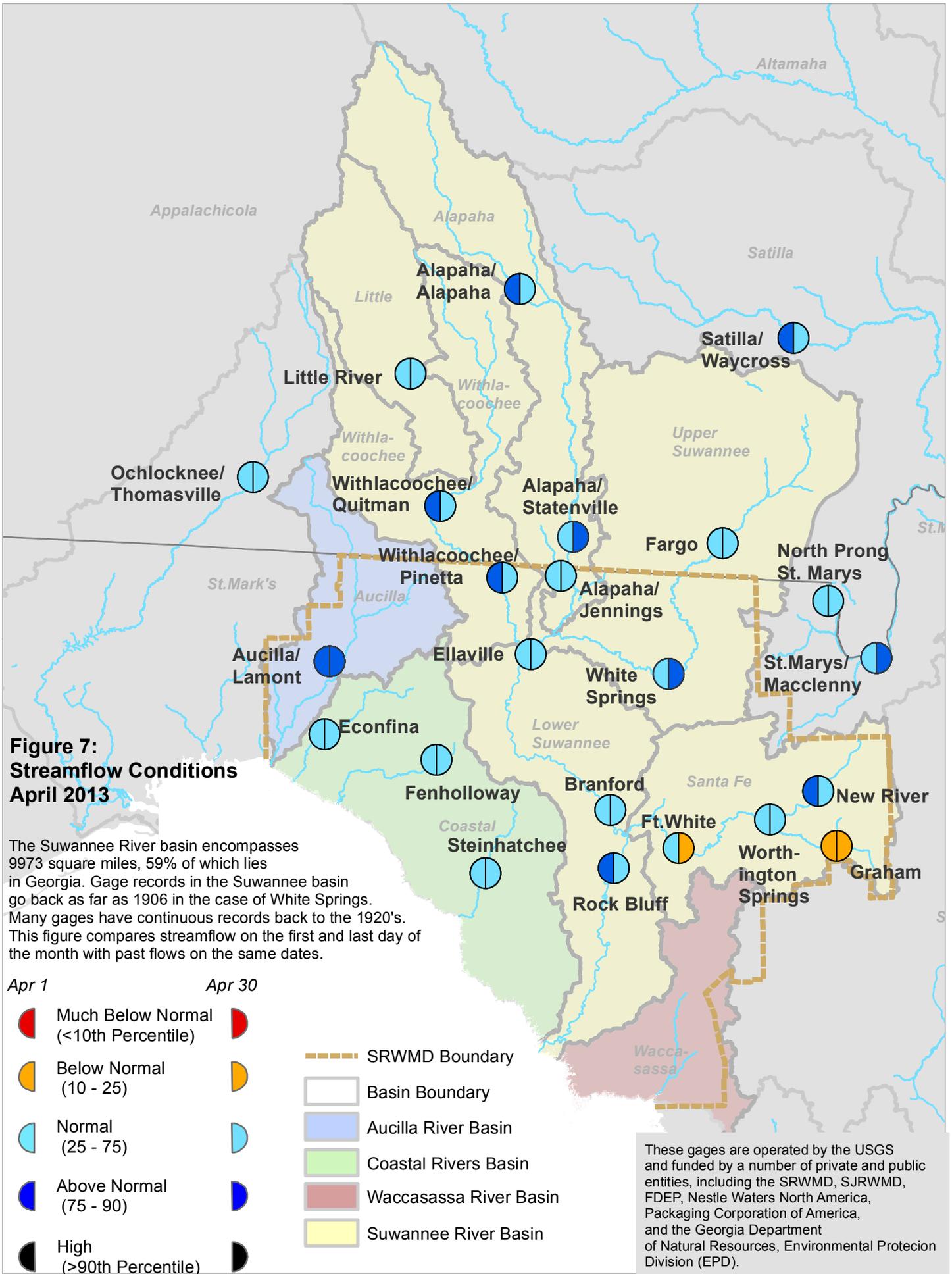


**Figure 6, cont:** Daily River Flow Statistics  
 May 1, 2012 through April 30, 2013

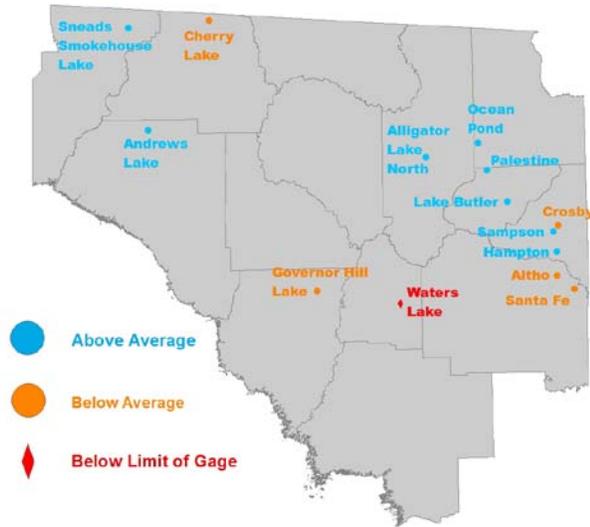


RIVER FLOW, CUBIC FEET PER SECOND



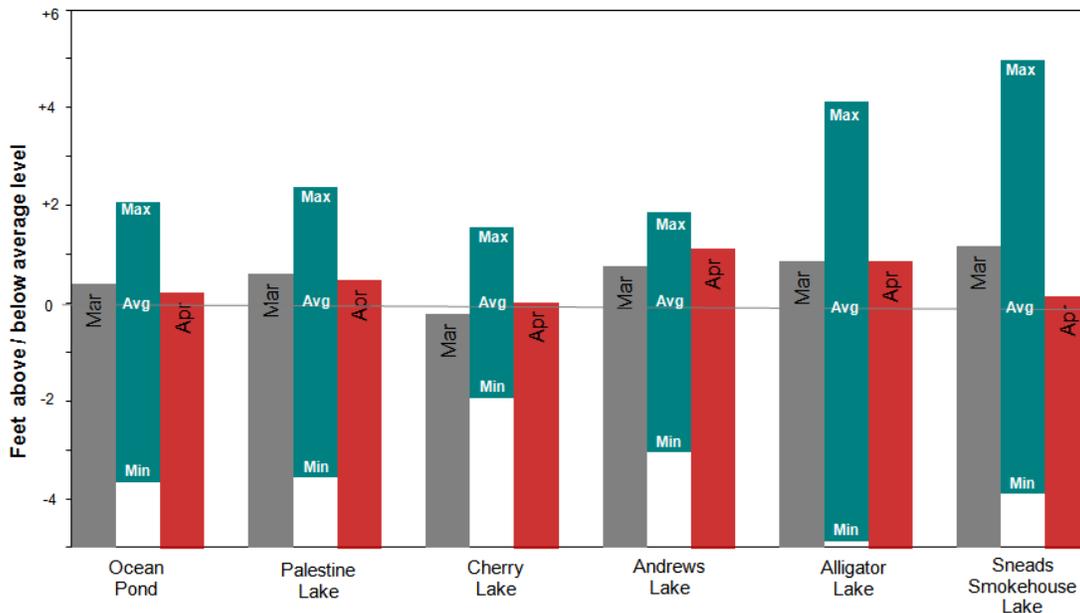
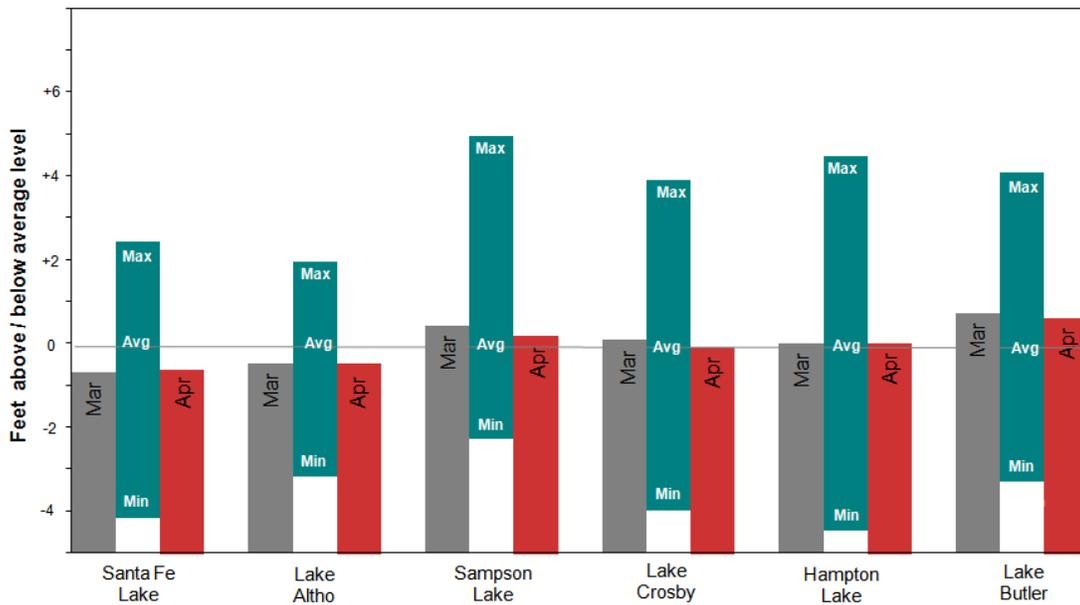


**Figure 8: April 2013 Lake Levels**



SRWMD lakes react differently to climatic changes depending on their location in the landscape. Some lakes, in particular ones in the eastern part of the District, are embedded in a surficial or intermediate aquifer over relatively impermeable clay deposits. These lakes rise and fall according to local rainfall and surface runoff. They retain water during severe droughts since most losses occur from evaporation. Other lakes, such as Governor Hill and Waters Lake, have porous or “leaky” bottoms that interact with the Floridan aquifer. These lakes depend on groundwater levels to stay high. If aquifer levels are low, these lakes go dry even if rainfall is normal.

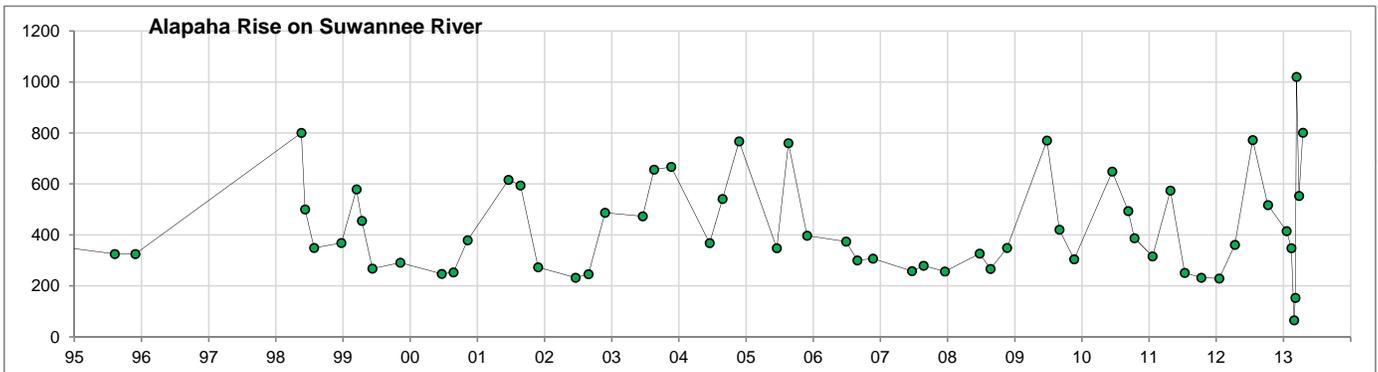
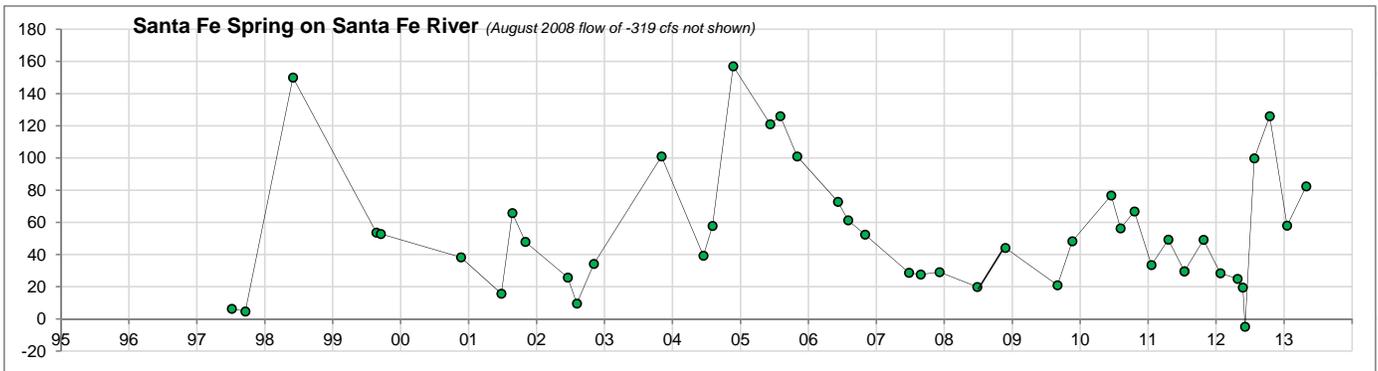
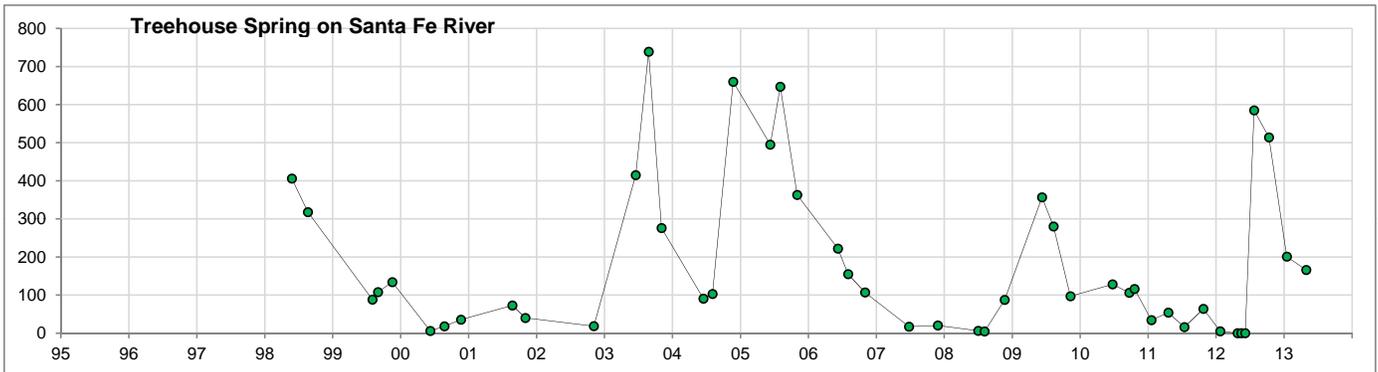
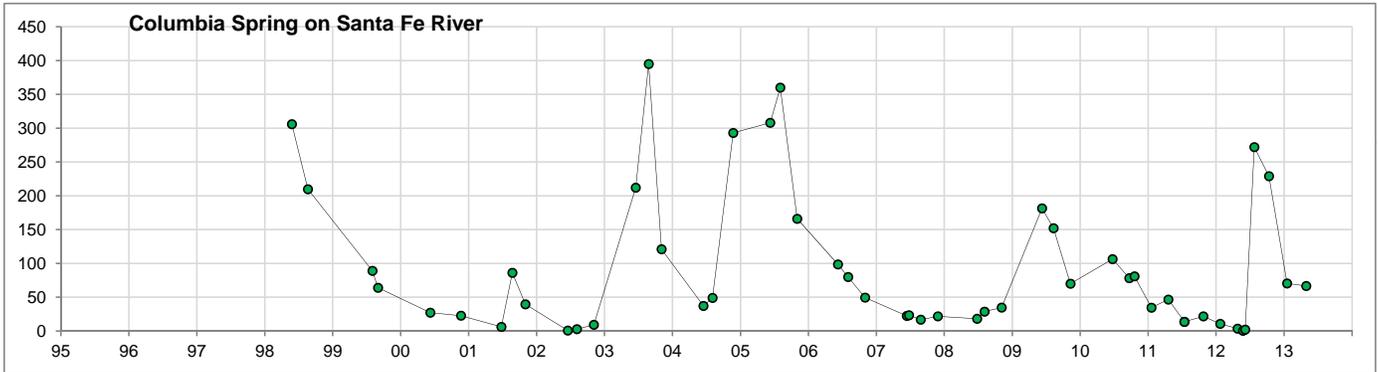
The District monitors 14 lakes with much of the data provided by volunteer observers. Most records go back to the 1970s, although the Sampson Lake record starts in 1957.

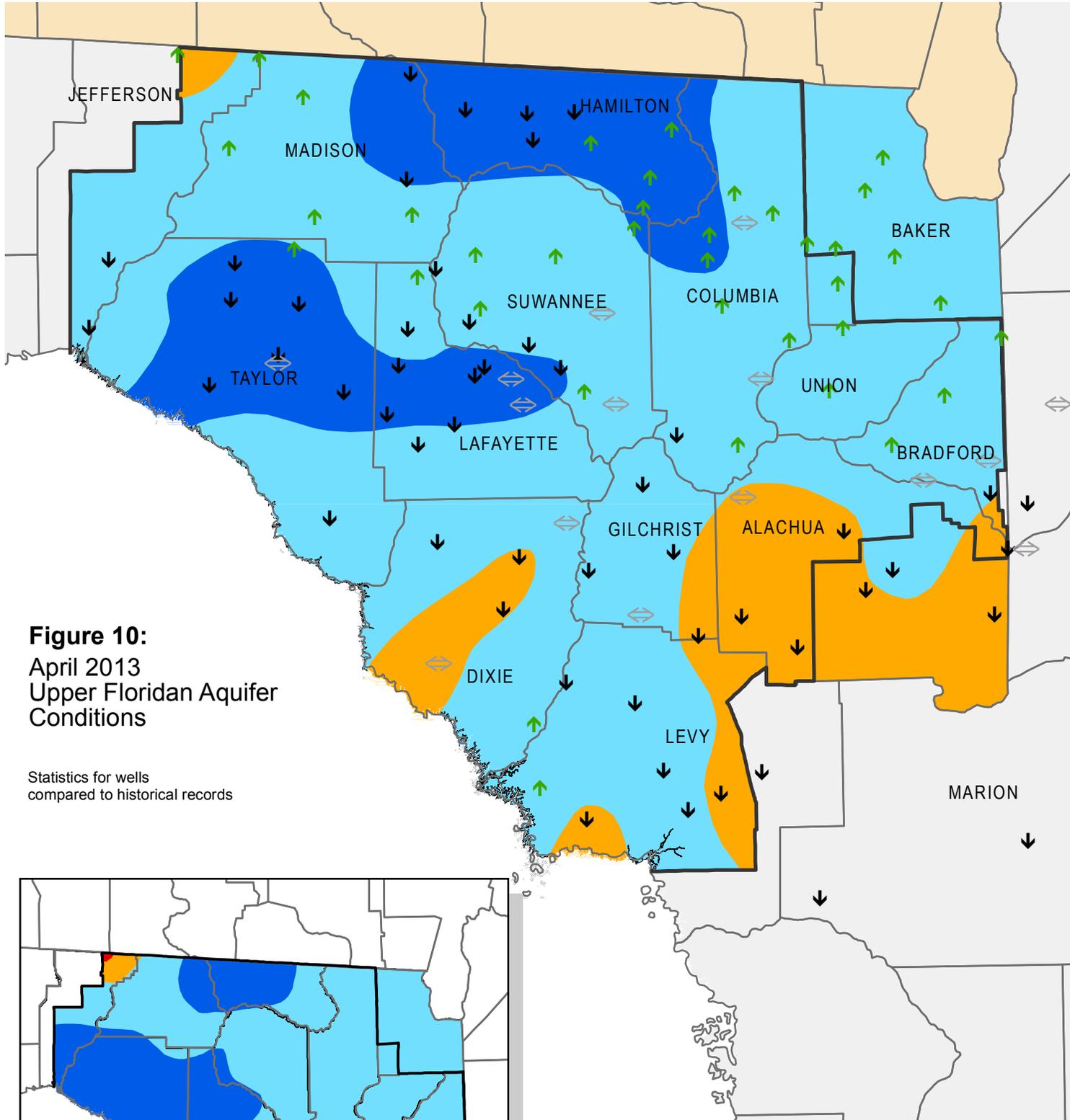


### Figure 9: Quarterly Springflow Measurements

The SRWMD monitors water quality at 30 springs. Flow is measured at the time of the sampling. The springs below were measured in April 2013. Flow is given in cubic feet per second.

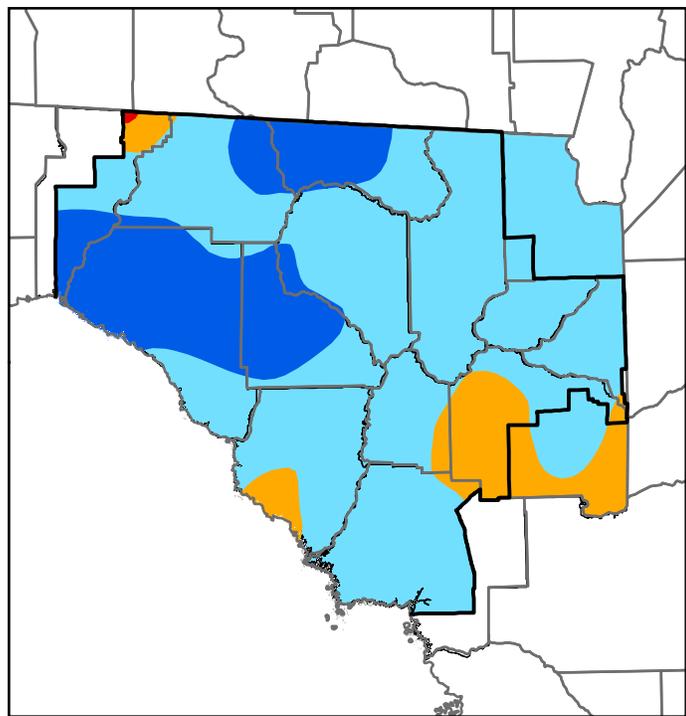
Spring flow is greatly affected by river levels. Rising river levels or high tides can slow spring flow or even reverse it. Some low flows in this data may not be representative of drought conditions.





**Figure 10:**  
 April 2013  
 Upper Floridan Aquifer  
 Conditions

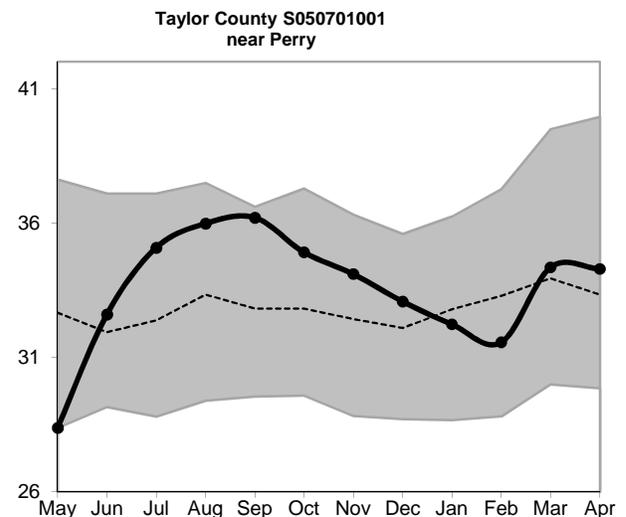
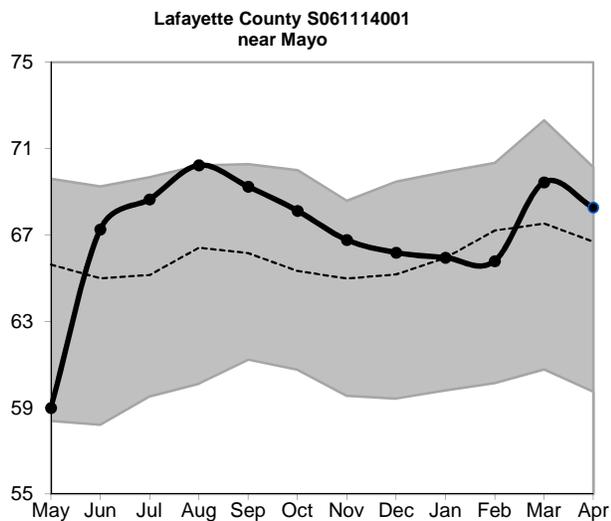
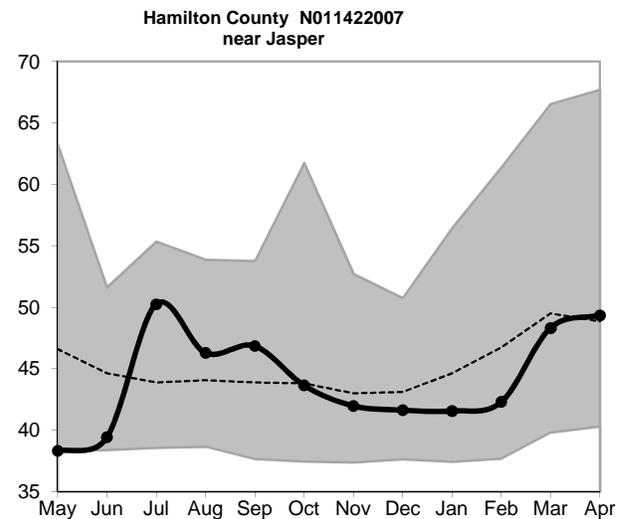
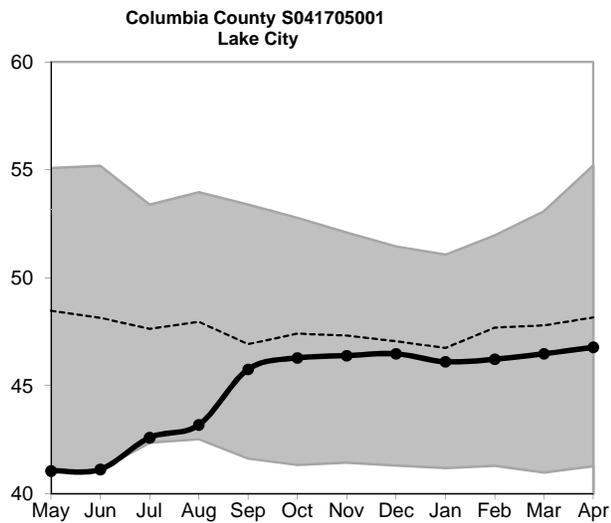
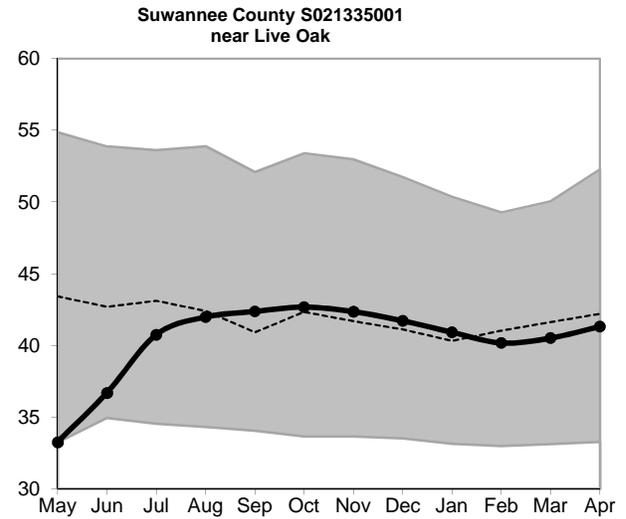
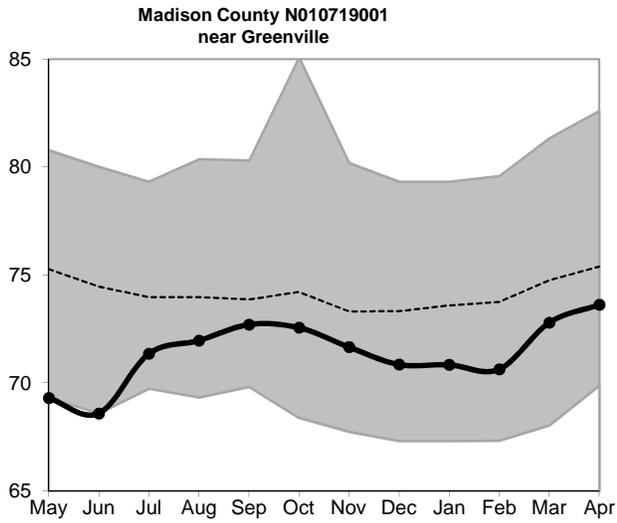
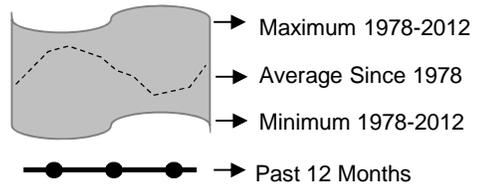
Statistics for wells  
 compared to historical records



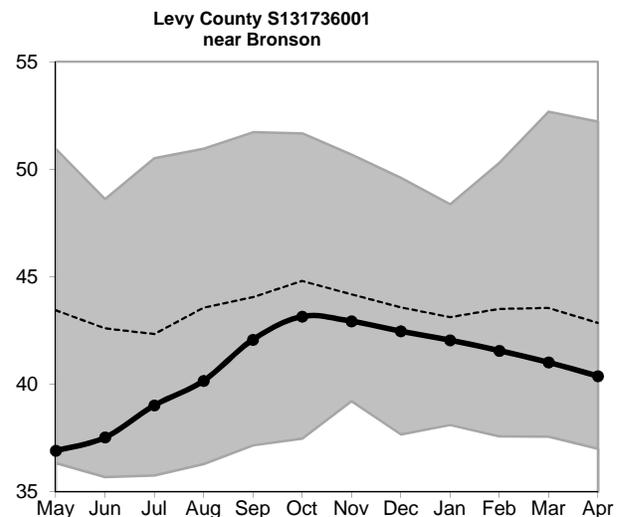
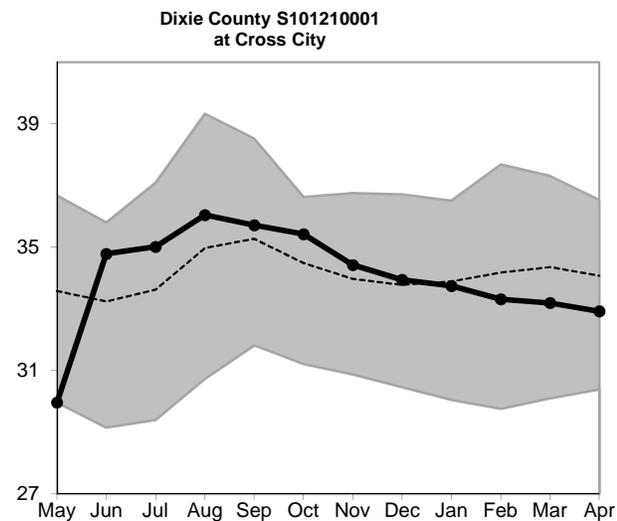
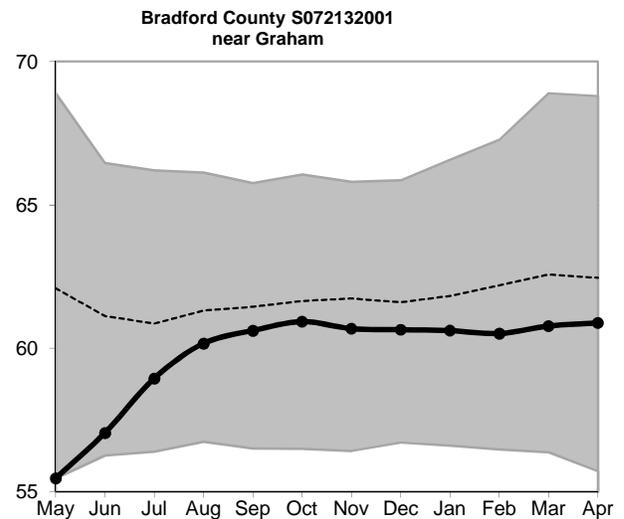
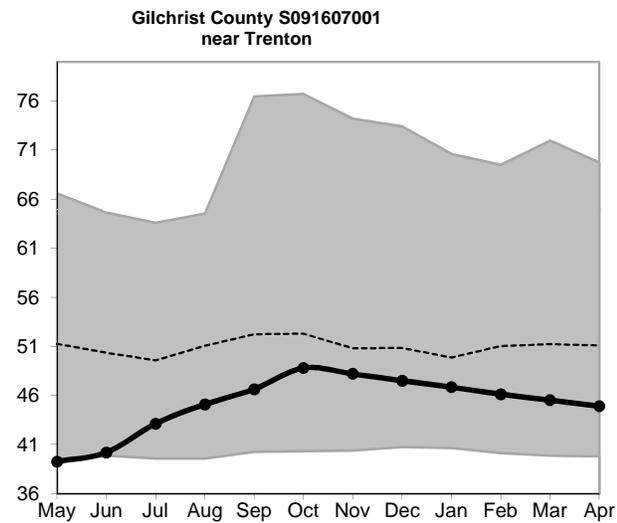
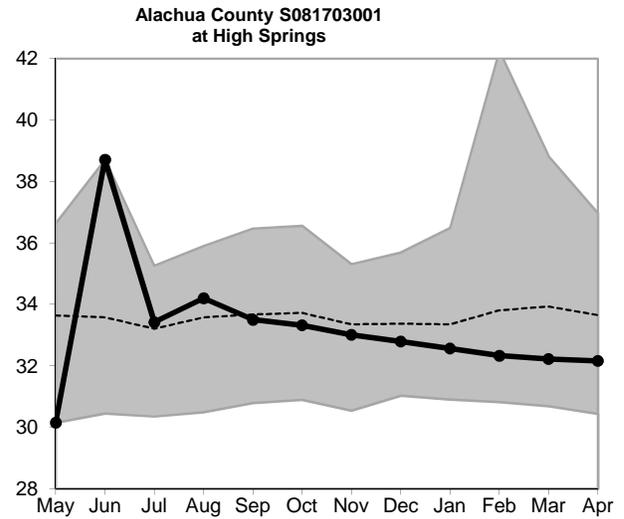
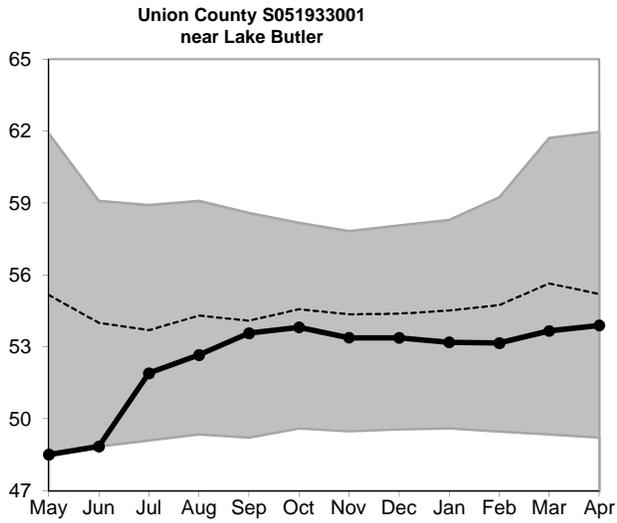
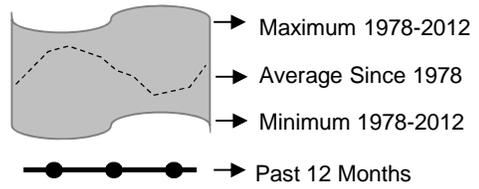
Inset: March 2013 Groundwater Levels

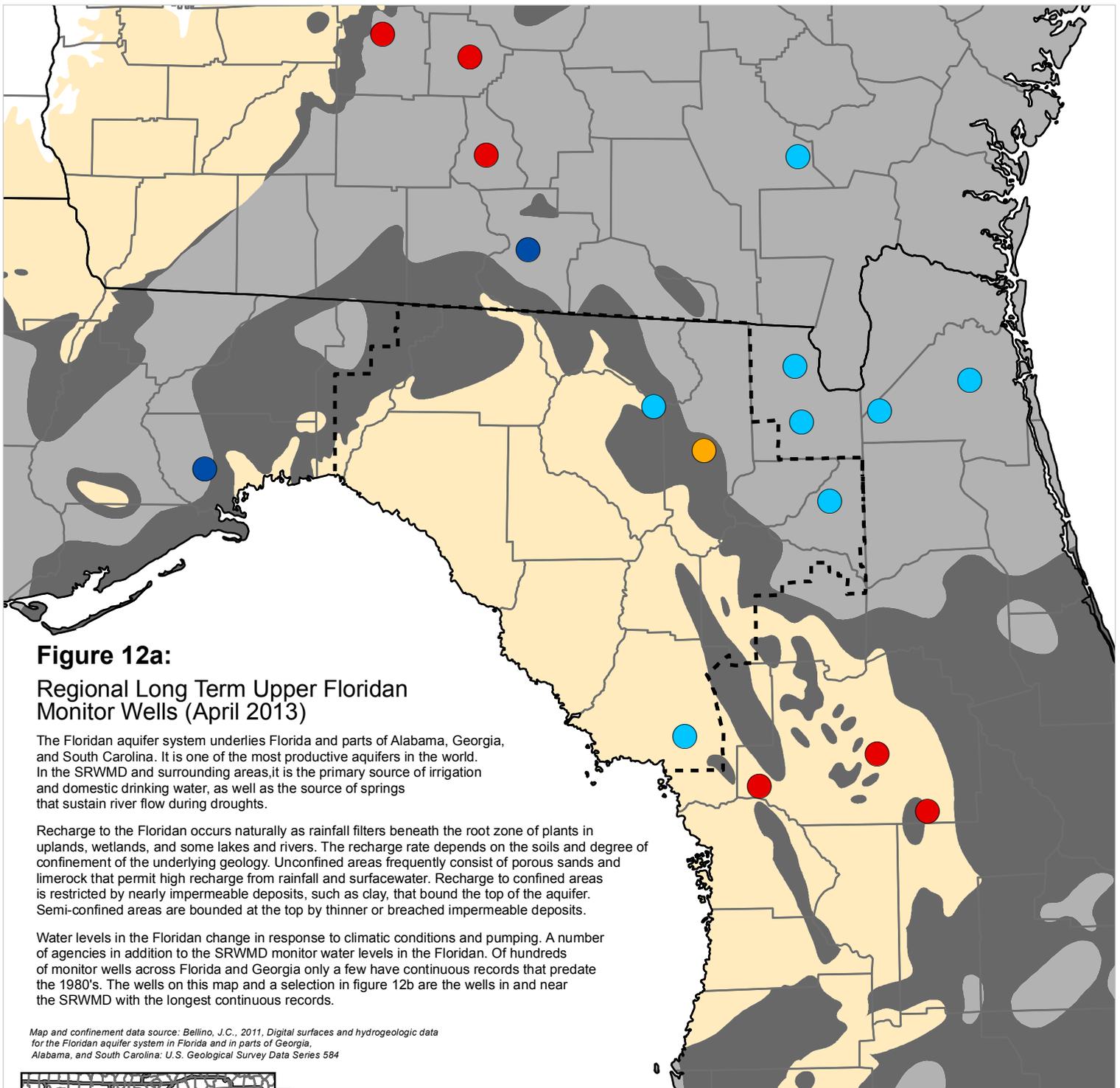
- High  
(Greater than 75th Percentile)
- Normal  
(25th to 75th Percentile)
- Low  
(10th to 25th Percentile)
- Extremely Low  
(Less than 10th Percentile)
- Increase/decrease in level since last month
- Increase/decrease since last month  
less than one percent of historic range
- District Boundary

**Figure 11: Monthly Groundwater Level Statistics**  
 Levels May 1, 2012 through April 30, 2013  
 Period of Record Beginning 1978  
 Datum is NGVD 1929



**Figure 11, cont.:** Groundwater Level Statistics  
 Levels May 1, 2012 through April 30, 2013  
 Period of Record Beginning 1978  
 Datum is NGVD 1929





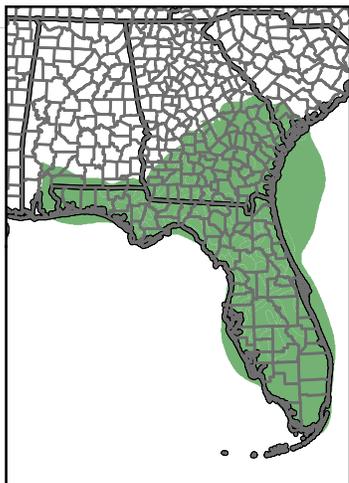
**Figure 12a:**  
**Regional Long Term Upper Floridan Monitor Wells (April 2013)**

The Floridan aquifer system underlies Florida and parts of Alabama, Georgia, and South Carolina. It is one of the most productive aquifers in the world. In the SRWMD and surrounding areas, it is the primary source of irrigation and domestic drinking water, as well as the source of springs that sustain river flow during droughts.

Recharge to the Floridan occurs naturally as rainfall filters beneath the root zone of plants in uplands, wetlands, and some lakes and rivers. The recharge rate depends on the soils and degree of confinement of the underlying geology. Unconfined areas frequently consist of porous sands and limerock that permit high recharge from rainfall and surfacewater. Recharge to confined areas is restricted by nearly impermeable deposits, such as clay, that bound the top of the aquifer. Semi-confined areas are bounded at the top by thinner or breached impermeable deposits.

Water levels in the Floridan change in response to climatic conditions and pumping. A number of agencies in addition to the SRWMD monitor water levels in the Floridan. Of hundreds of monitor wells across Florida and Georgia only a few have continuous records that predate the 1980's. The wells on this map and a selection in figure 12b are the wells in and near the SRWMD with the longest continuous records.

Map and confinement data source: Bellino, J.C., 2011, Digital surfaces and hydrogeologic data for the Floridan aquifer system in Florida and in parts of Georgia, Alabama, and South Carolina: U.S. Geological Survey Data Series 584



Inset: Extent of Floridan Aquifer

**Occurrence of Confined and Unconfined Conditions in the Upper Floridan Aquifer**

-  Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
-  Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
-  Unconfined: Upper confining unit is absent or very thin. Recharge is high.

**Percentile of Most Recent Water Level Relative to Entire Record**

-  High (Greater than 75th Percentile)
-  Normal (25th to 75th Percentile)
-  Low (10th to 25th Percentile)
-  Extremely Low (Less than 10th Percentile)
-  Not Available
-  SRWMD Boundary

# Figure 12b: Regional Long Term Upper Floridan Levels

April 2013

Upper Floridan Aquifer levels in feet above mean sea level

Taylor and Sanderson wells courtesy of SJRWMD

