

MEMORANDUM

TO: Governing Board

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

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

DATE: April 3, 2014

RE: March 2014 Hydrologic Conditions Report for the District

RAINFALL

- District-wide rainfall in March was 7.49", about 3" higher than the historic average based on records beginning in 1932 (Table 1, Figure 1). Totals were mostly uniform across the District with every county seeing above-average rainfall. The area of lowest rainfall was southeastern Bradford County, but rainfall there was still higher than normal. Northern Taylor County received up to 10.5" (Figure 2).
- The highest gaged monthly total was 9.31" at Cooks Hammock Tower in Lafayette County, which also had the highest daily total of 4.92". The lowest gaged monthly total was 4.91" at Santa Fe Lake.
- This was the wettest March since 2003, and the 13th wettest in 80 years of record-keeping. The highest rainfall recorded in March was 13.8" in 1948, which caused record flooding on the Suwannee River.
- Rainfall totals were similarly high in the Suwannee River's Georgia tributaries, with most areas receiving above-normal precipitation (Figure 3).
- Average rainfall for the 12 months ending March 31 was 9.5" higher than the long-term average of 54.63" (Figure 4), the highest annual surplus since 2005. Average rainfall for the 3 months ending March 31 was 5.8" higher than the long-term average of 12" (Figure 5). The total between December and March was 20.9", making this the wettest winter since 1998.

SURFACEWATER

- **Rivers:** Upper Santa Fe River gages had flows higher than the 75th percentile when a mid-month frontal system dropped 2-4" of rain in the basin. Minor flooding resulted at the upper gages and later downstream at the Fort White and Three Rivers gages. The Fort White crest of 24.8' was the highest since Tropical Storm Debby in 2012. The Three Rivers crest was the 4th flood since March 2013. The Suwannee and its tributaries also rose in response to heavy rainfall, but with the exception of the Withlacoochee River in Valdosta none of the gages reached flood stage. The Suwannee River at White Springs rose almost 9' and the Withlacoochee at Pinetta more than 10'. The Pinetta gage crested with a flow in the top 5% of flows (based on records beginning in 1931), but remained 9' below flood stage. The Steinhatchee, Econfinia, and Aucilla rivers reached flood stage at least once during the month. Statistics for a number of rivers are presented graphically in Figure 6, and conditions relative to historic conditions are in Figure 7.

The Florida Department of Health issued three separate notices advising minimal contact with the Withlacoochee River after the City of Valdosta reported spills involving stormwater and sewage into the Withlacoochee River and tributaries of the Alapaha River. Subsequent testing by Florida officials of both rivers showed fecal coliform totals lower than the state's water quality threshold, causing the advisories to be lifted.

- **Lakes:** Levels rose at all of the District's monitored lakes for the second month in a row. All the lakes including Waters Lake in Gilchrist County were above their long-term average levels. Waters Lake rose to its highest level since 2006. Lake Butler saw its highest level since 1998.

Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for a number of monitored lakes.

- **Springs:** Troy Springs, Lafayette Blue Springs, Madison Blue Springs, and Fanning Springs either closed or remained closed to swimming and diving due to inundation from river water. Manatee Springs was measured flowing at 100 MGD (million gallons per day), 20% lower than measurements made in October, November, and December of last year. The flow reduction was caused by high river levels rather than low aquifer levels, since monitor wells in the Manatee springshed were at their highest level since 2006. The Suwannee River continued to flow into White Sulphur Springs for the third month in a row. Statistics for Manatee Springs and others are shown in Figure 9.

GROUNDWATER

Upper Floridan aquifer levels improved for the third month in a row. Overall, levels increased from near the 78th percentile in February to the 90th percentile in March, based on records beginning in the 1970s. Eighty-two percent of monitor wells were above the 75th percentile, considered high. Half were above the 90th percentile, considered very high. In general, conditions were at their highest since September 2005. The monitor well at Cooks Hammock Tower in southeastern Lafayette County recorded its highest level since monitoring began in 1987. Only one well in the District, in northwestern Jefferson County, was below its long-term median. Statistics for a representative sample of wells are shown in Figure 11, and 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 values for the week ending March 29 indicated normal conditions in north Florida and southeast Georgia.
- The National Weather Service Climate Prediction Center (CPC) three-month outlook showed equal chances of above- or below-normal precipitation through June. The CPC issued an El Niño watch on March 6 giving a 50% chance of El Niño developing in the summer or fall. A more recent update was not available at the time of this report. According to the National Weather Service, El Niño effects including enhanced precipitation and severe weather in the southeast are strongest in the fall, winter, and spring. In the summer, El Niño can reduce the formation of tropical cyclones in the Atlantic by causing increased wind shear.
- The U.S. Drought Monitor report of April 1 showed no drought conditions in north Florida or south Georgia, except for a small area in the upper reaches of the Alapaha watershed in Georgia.

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 during Daylight Savings Time (between March 9 and November 2, 2014) 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. More information about the SRWMD's year-round lawn and landscape irrigation measures is available at www.mysuwanneeriver.com.

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 or by request.

Table 1: Estimated Rainfall Totals (inches)

County	March 2014	March Average	Month % of Normal	Last 12 Months	Annual % of Normal
Alachua	6.43	4.21	153%	62.73	123%
Baker	6.47	4.36	148%	55.26	111%
Bradford	5.93	4.29	138%	56.75	112%
Columbia	7.11	4.62	154%	58.59	114%
Dixie	7.10	4.79	148%	68.17	115%
Gilchrist	7.06	4.84	146%	66.08	115%
Hamilton	7.37	5.17	142%	58.08	111%
Jefferson	8.24	5.80	142%	57.08	94%
Lafayette	8.28	5.03	165%	70.17	124%
Levy	7.71	5.03	153%	72.00	121%
Madison	8.32	5.72	145%	63.48	113%
Suwannee	7.62	5.17	147%	65.32	123%
Taylor	8.70	5.34	163%	70.57	119%
Union	6.83	4.85	141%	57.39	106%

March 2014 Average: 7.49
 March Average (1932-2013): 4.50
 Historical 12-month Average (1932-2013): 54.63
 Past 12-Month Total: 64.16
 12-Month Rainfall Surplus: 9.53

Figure 1: Comparison of District Monthly Rainfall

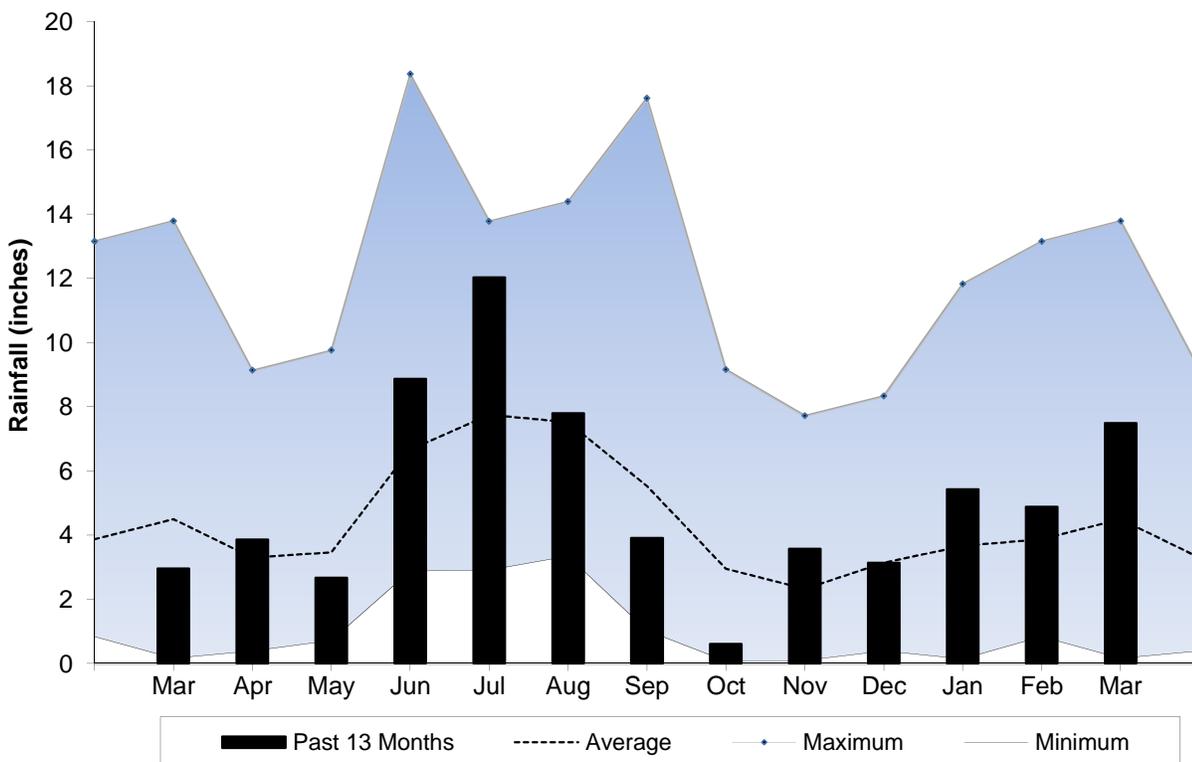


Figure 2: March 2014 Rainfall Estimate

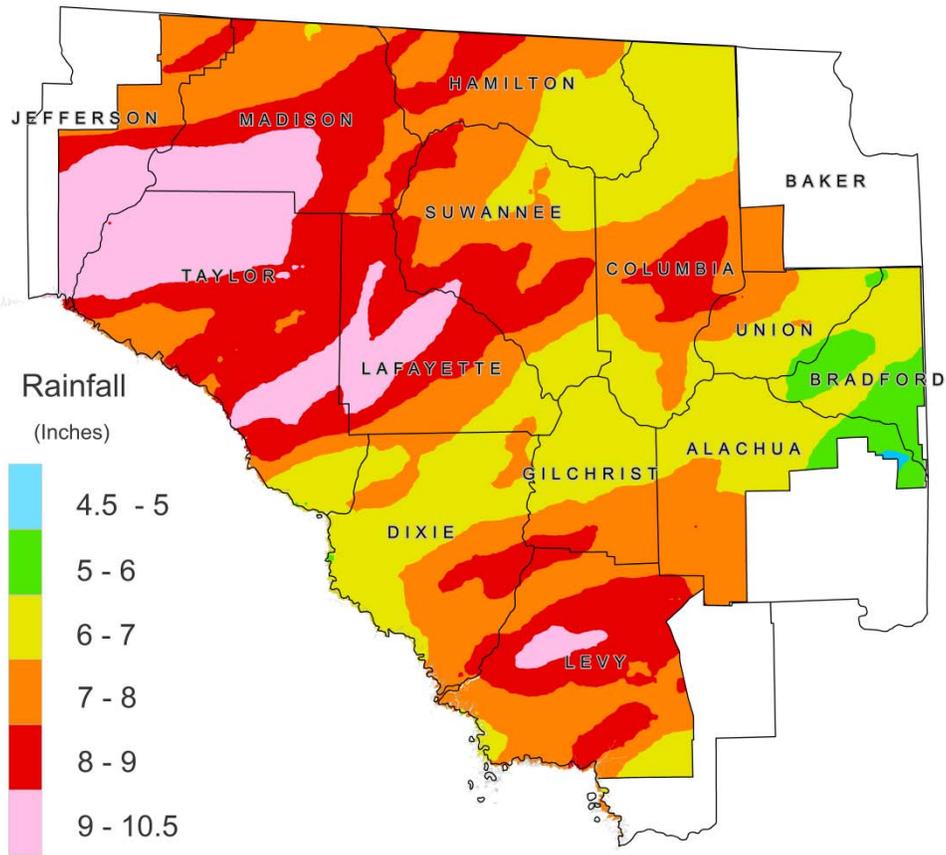


Figure 3: March 2014 Percent of Normal Rainfall

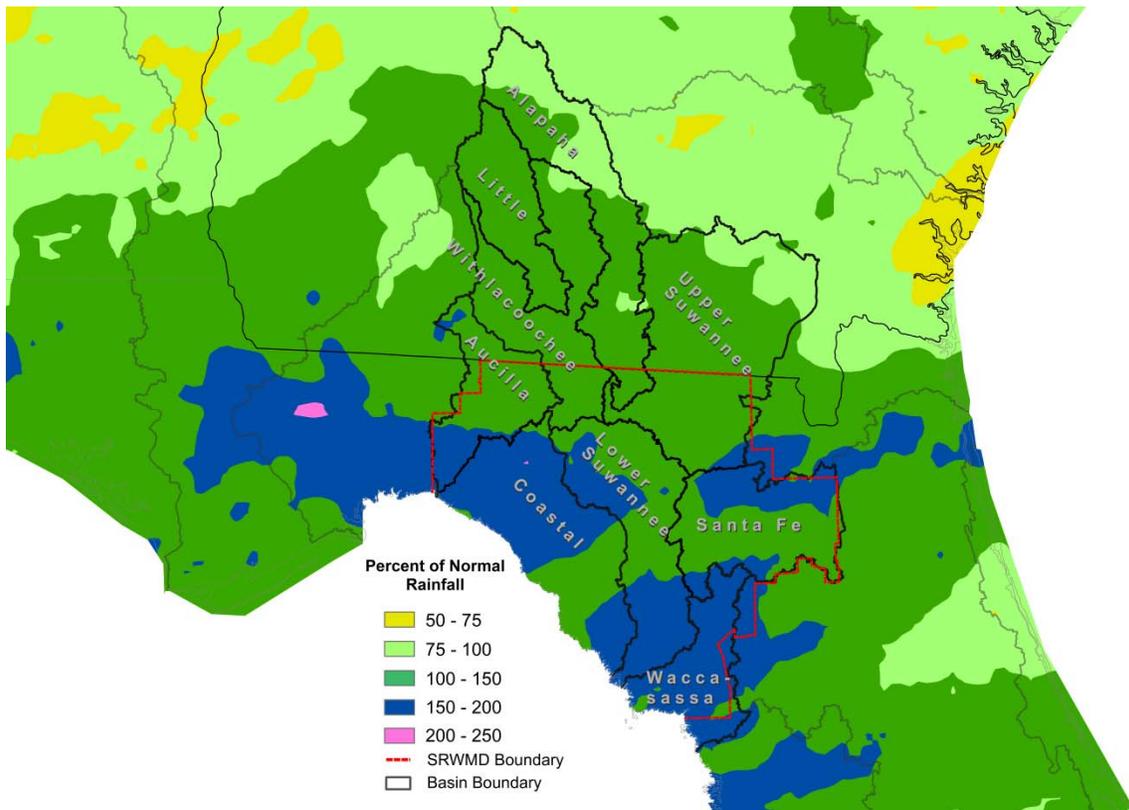


Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin Through March 31, 2014

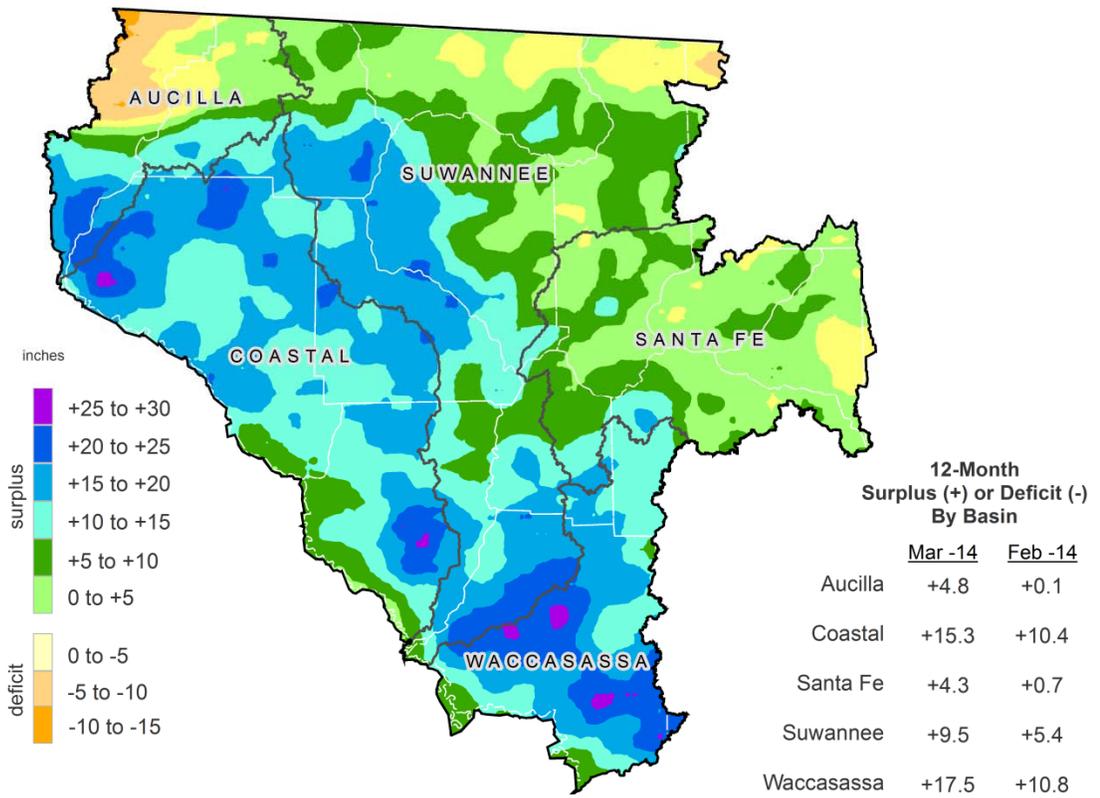


Figure 5: 3-Month Rainfall Surplus/Deficit by River Basin Through March 31, 2014

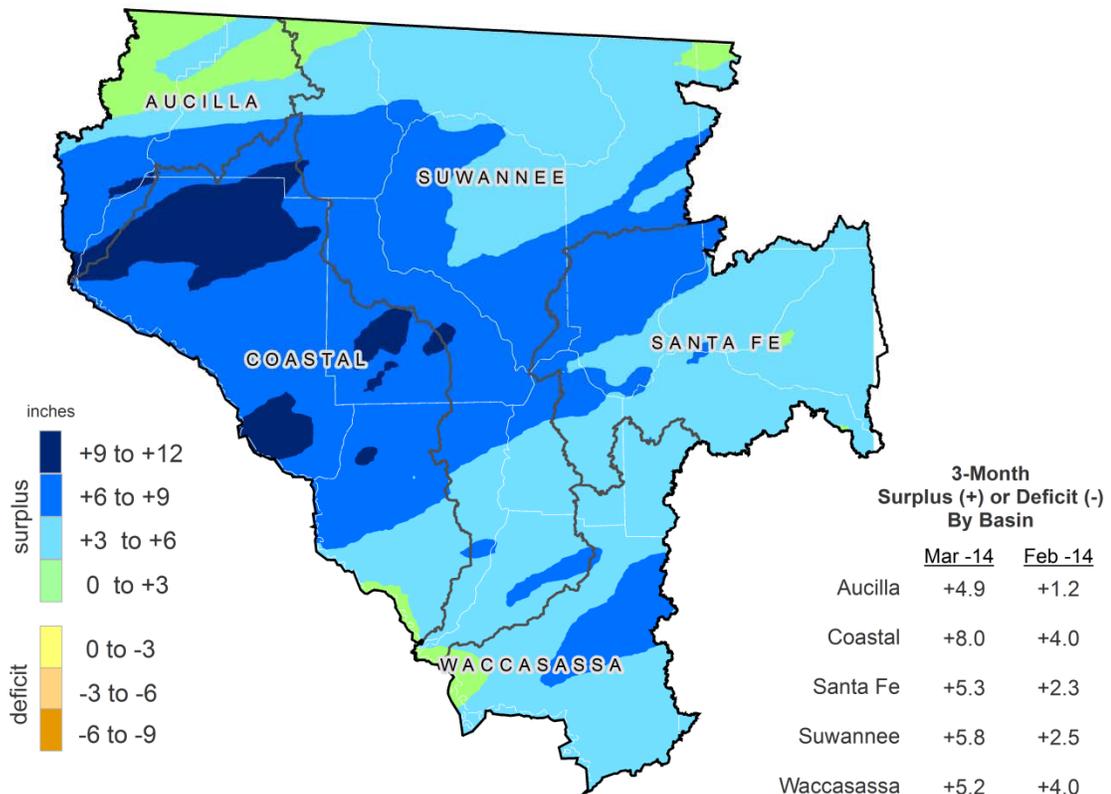
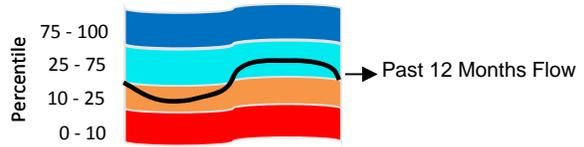


Figure 6: Daily River Flow Statistics

April 1, 2013 through March 31, 2014



RIVER FLOW, CUBIC FEET PER SECOND

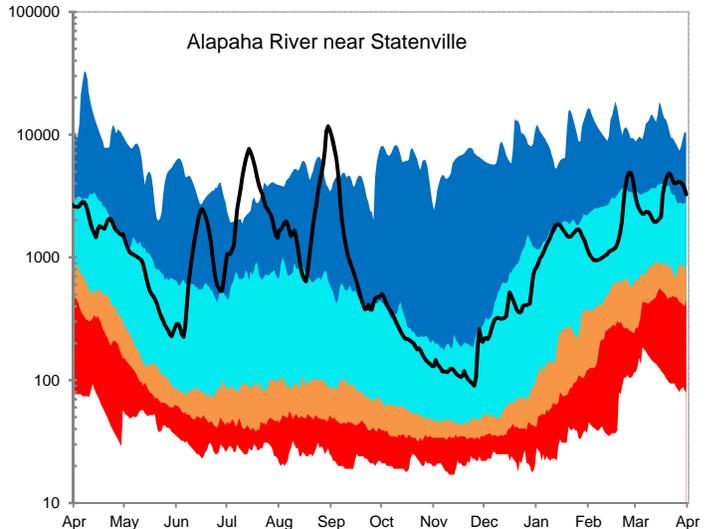
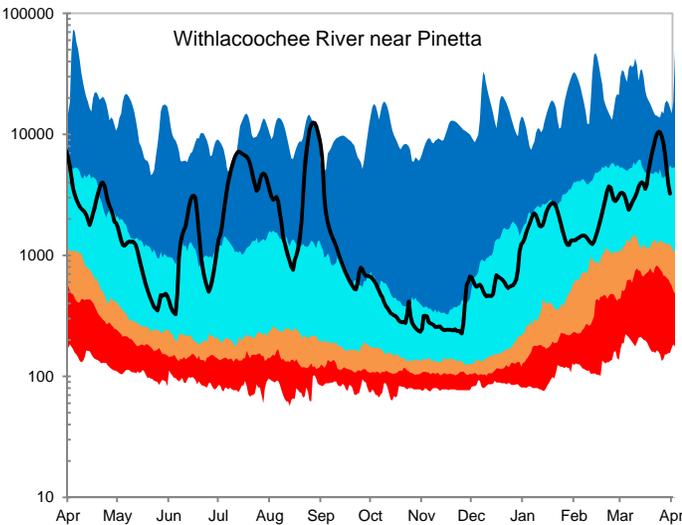
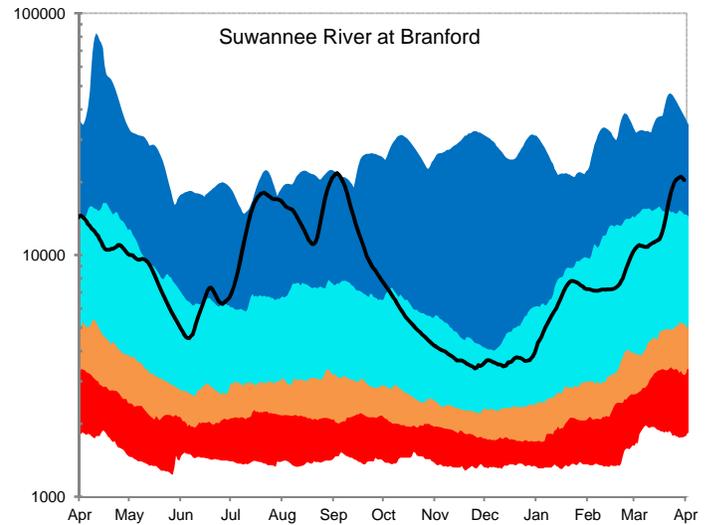
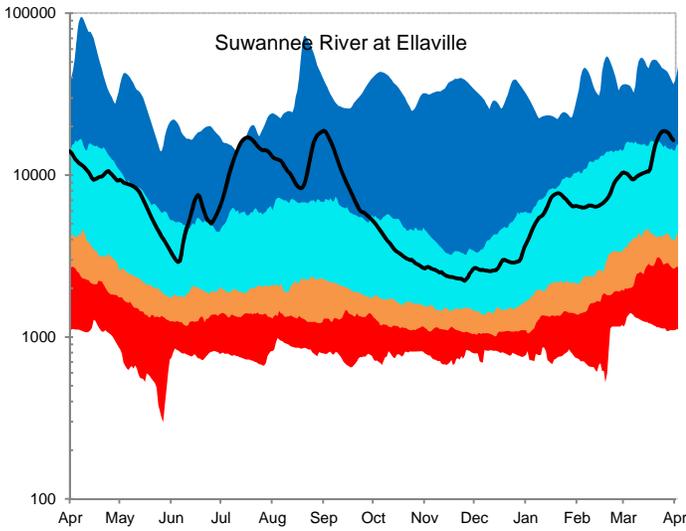
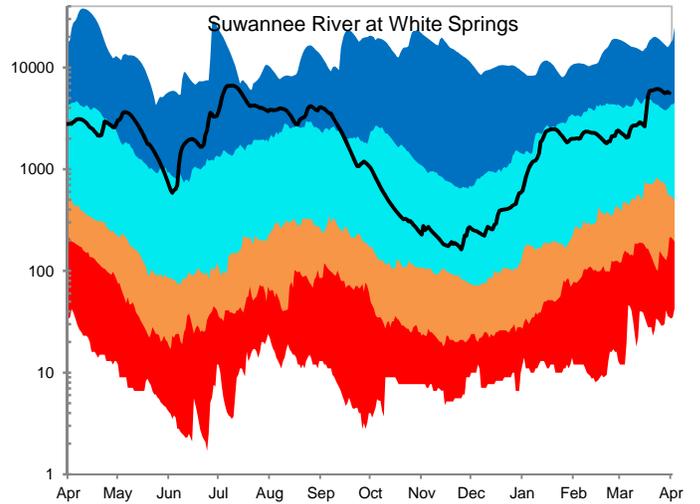
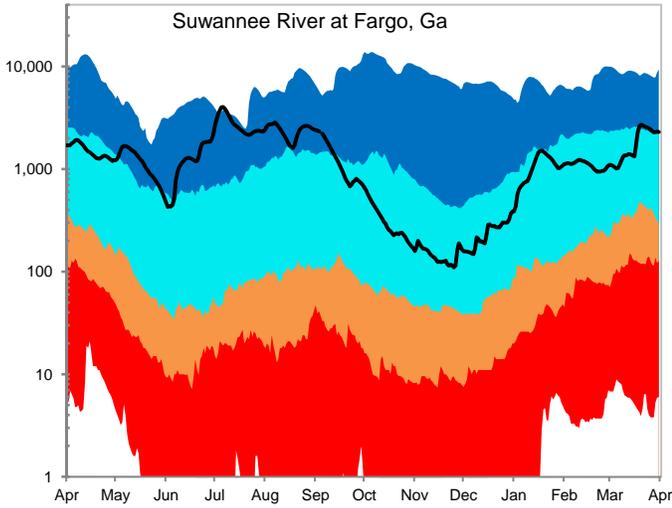
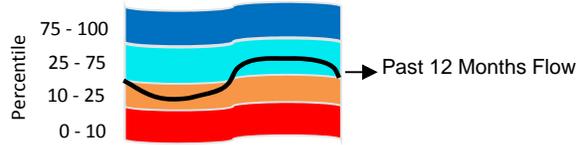
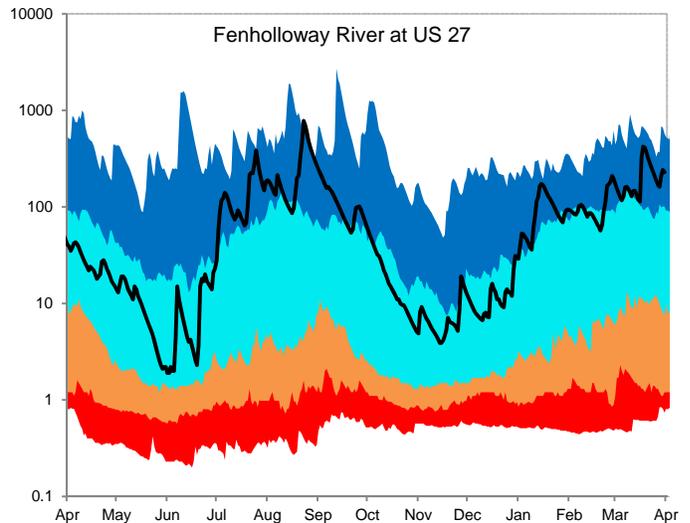
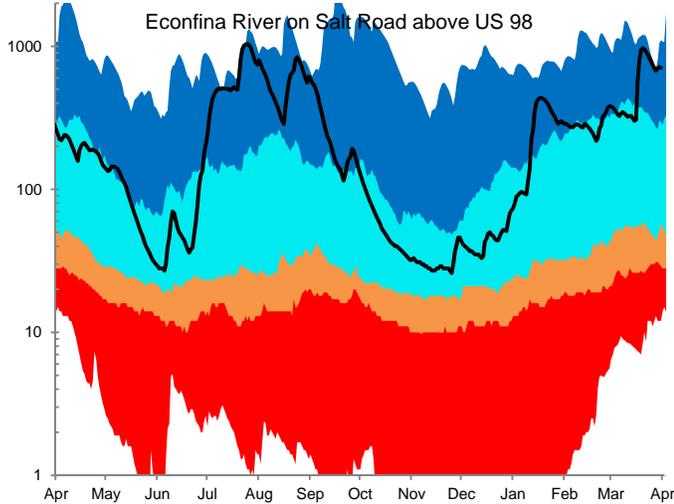
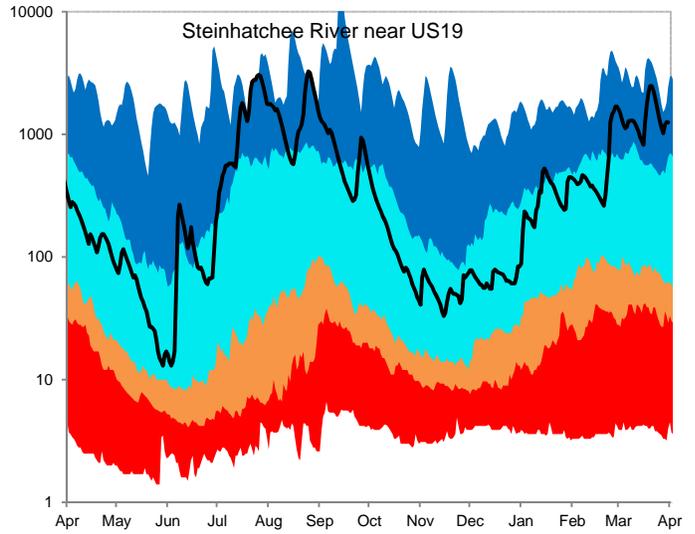
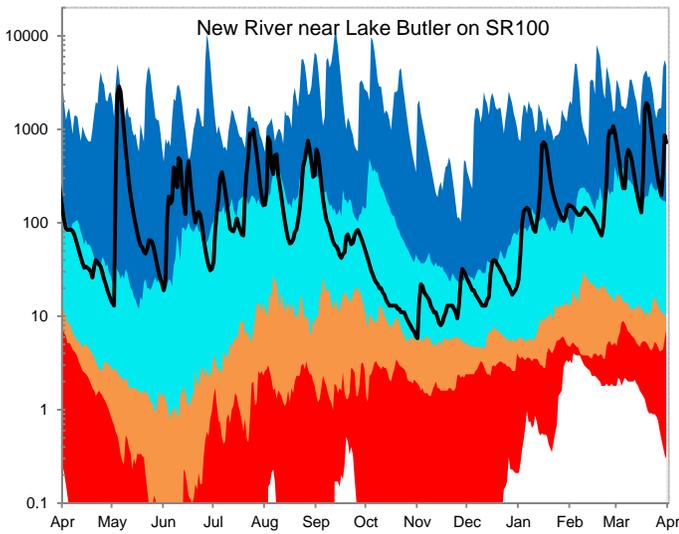
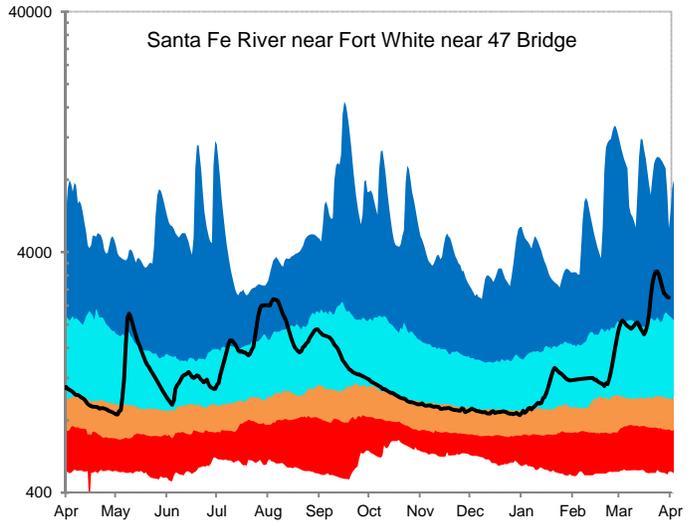
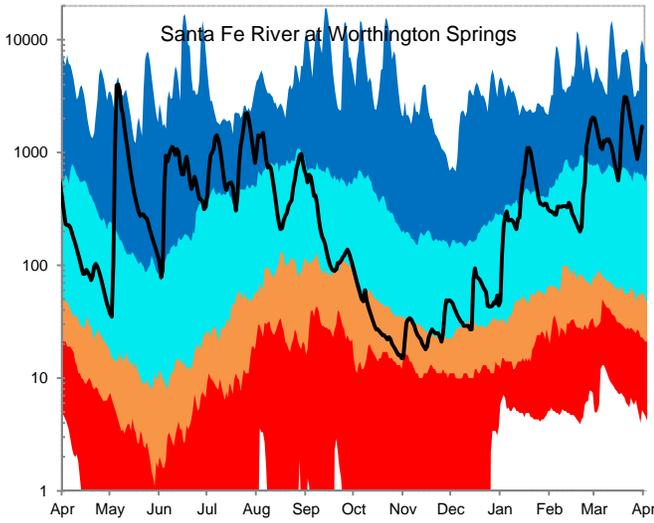


Figure 6, cont: Daily River Flow Statistics
 April 1, 2013 through March 31, 2014



RIVER FLOW, CUBIC FEET PER SECOND



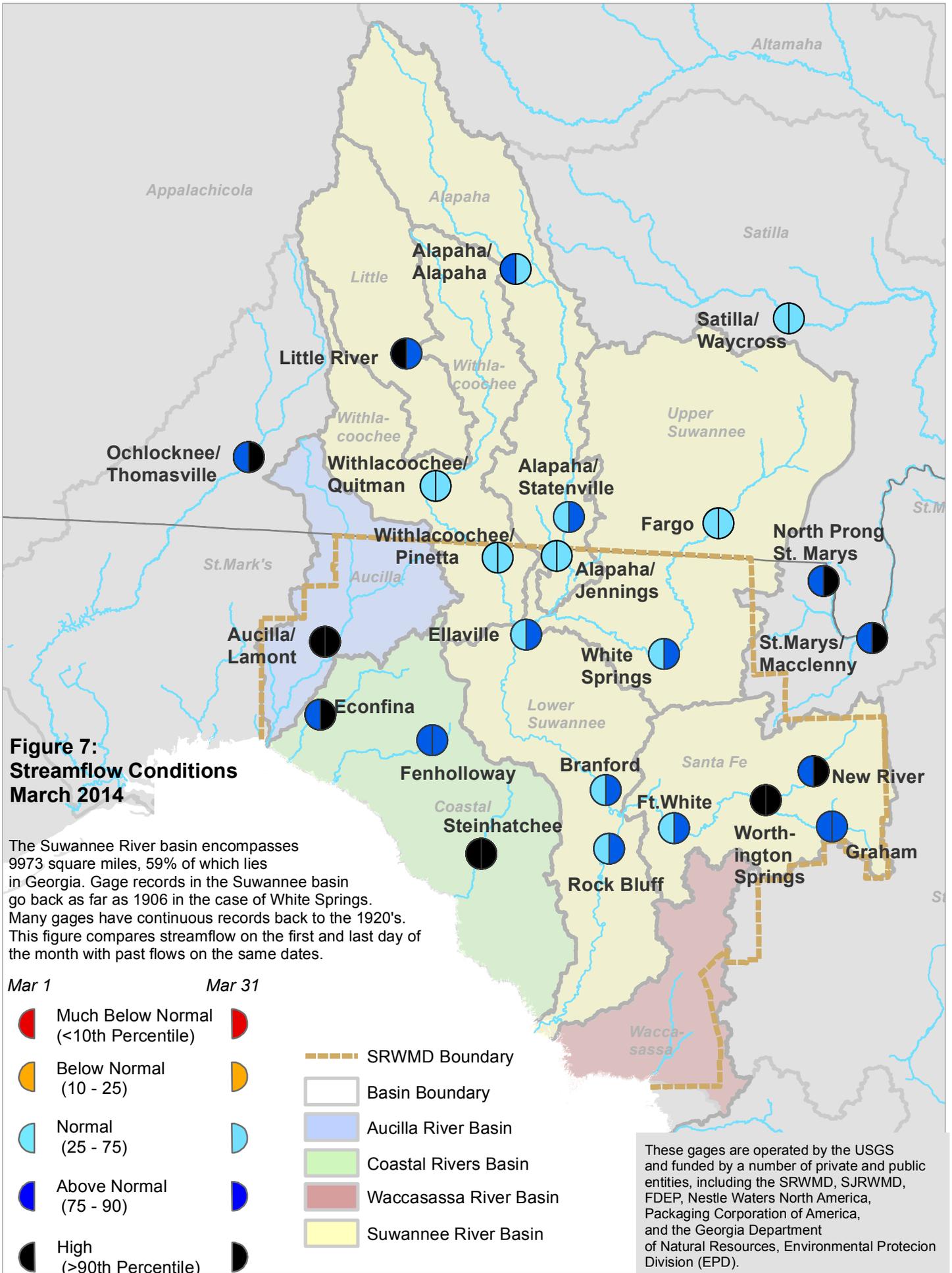


Figure 8: March 2014 Lake Levels



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.

Feet Above or Below Historic Average

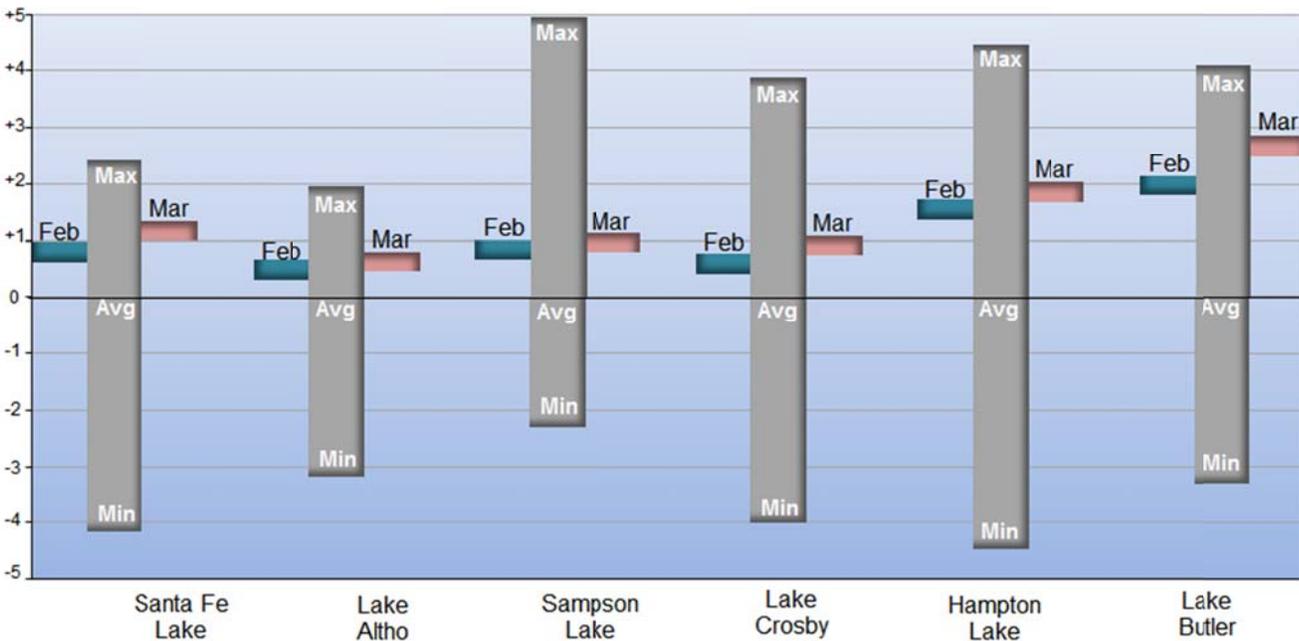
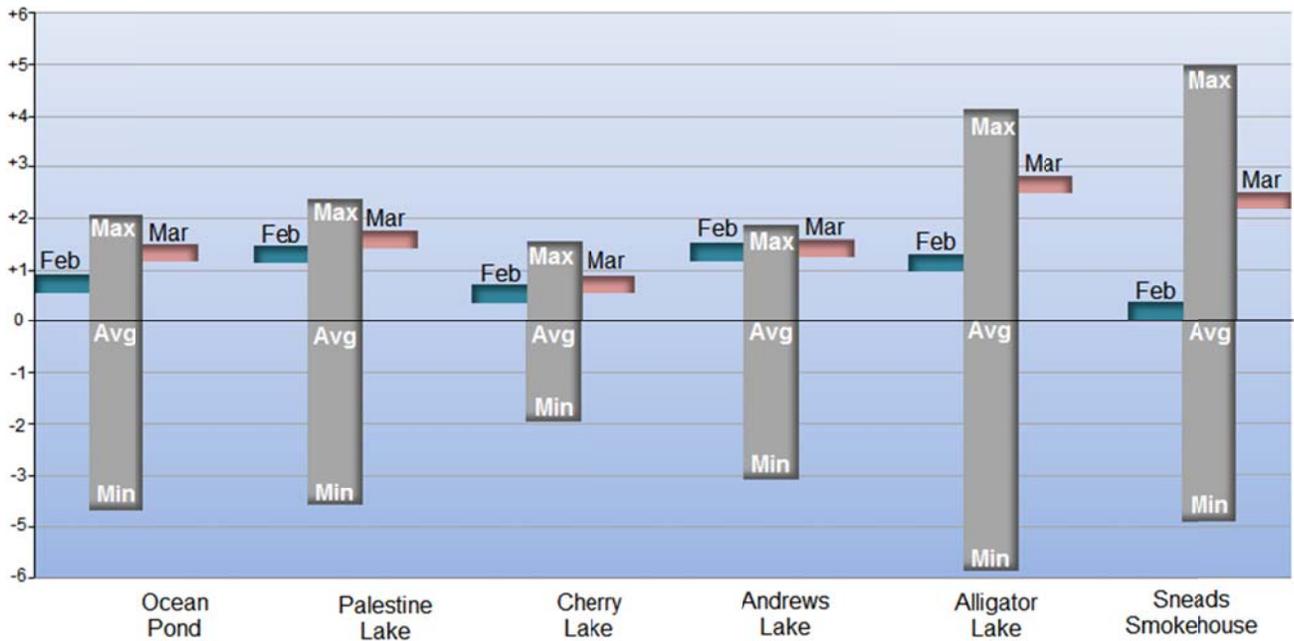
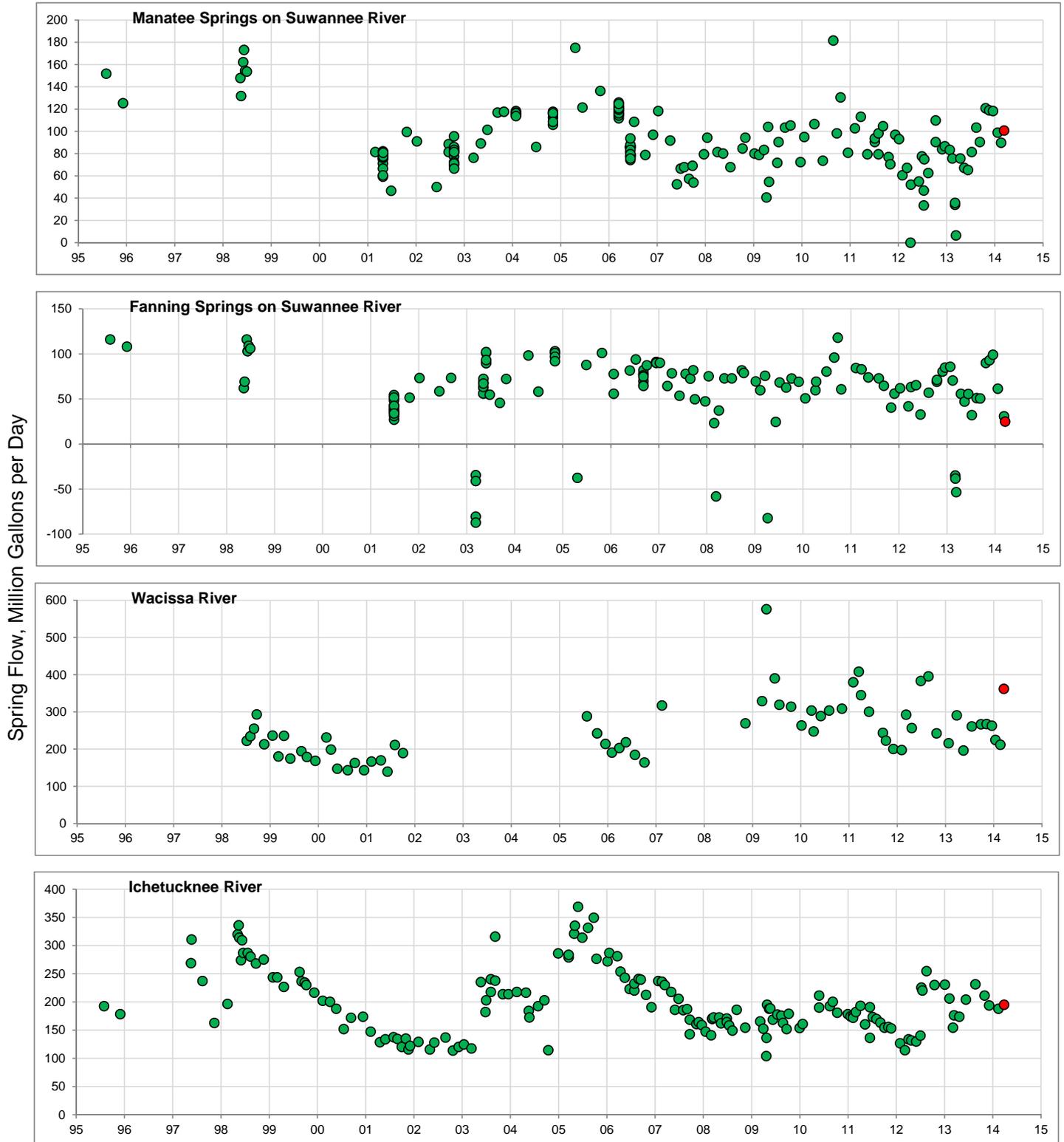


Figure 9: Quarterly Springflow Measurements

The SRWMD monitors water quality at 38 springs. Flow is measured at the time of the sampling. The springs below were measured in March 2014, with the last measurement marked in red. Flow is given in million gallons per day (MGD).

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



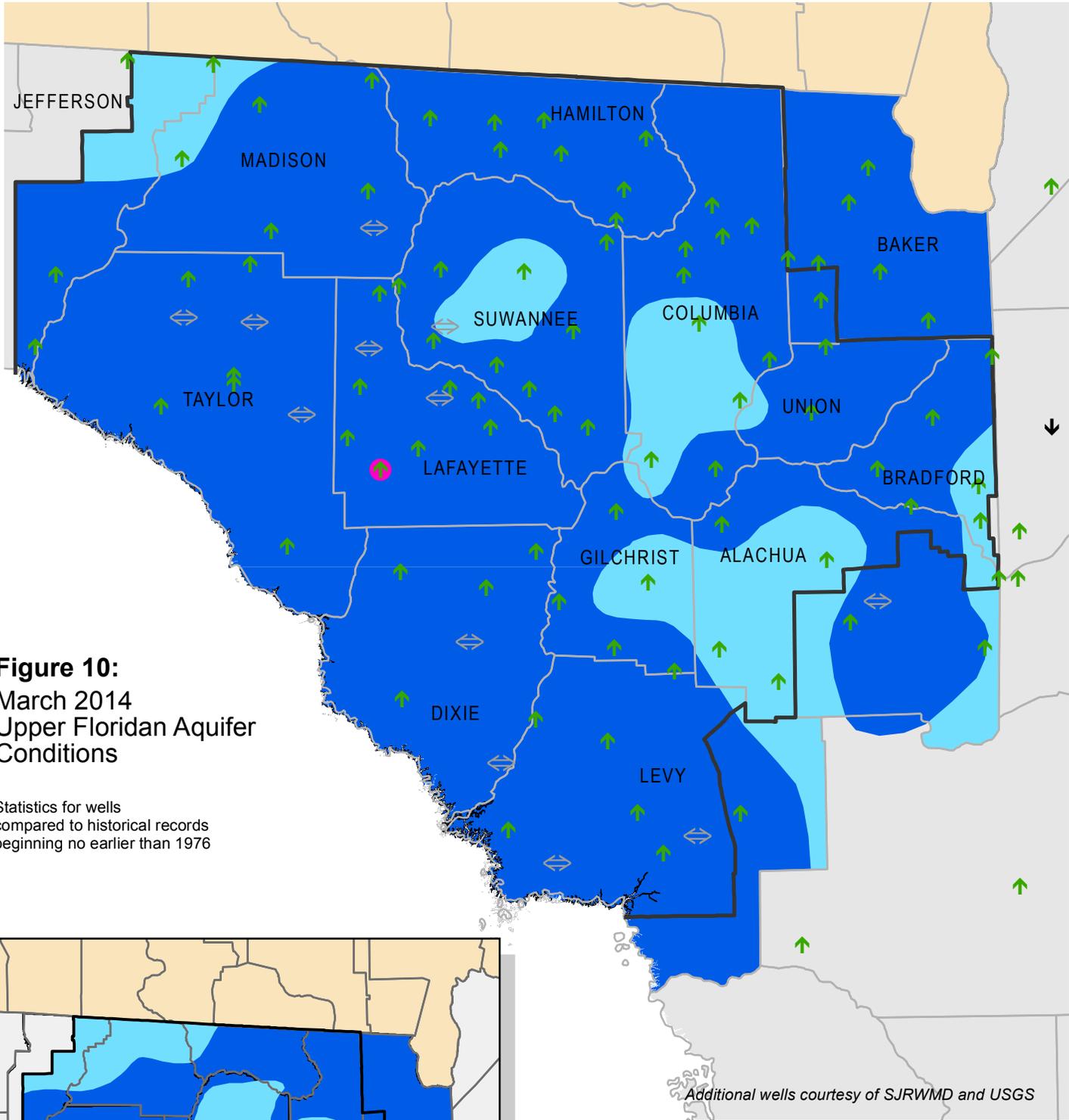
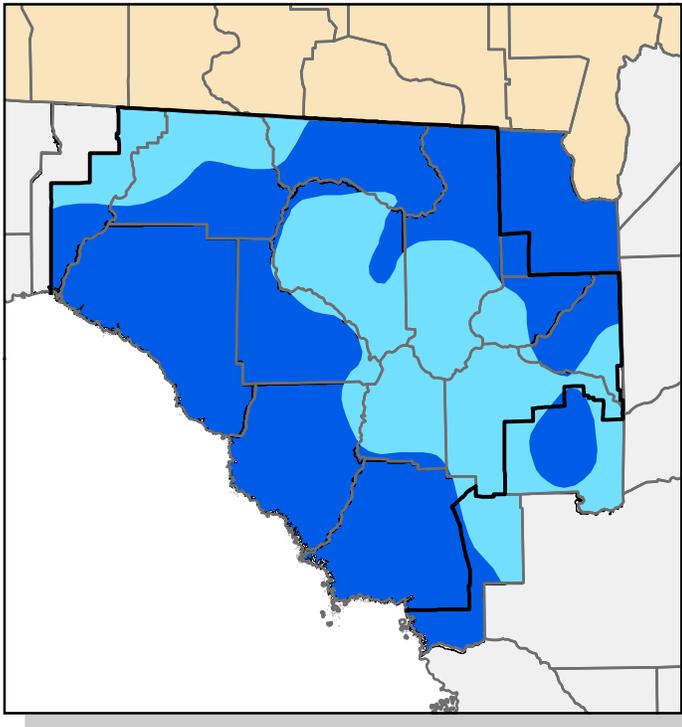


Figure 10:
 March 2014
 Upper Floridan Aquifer
 Conditions

Statistics for wells compared to historical records beginning no earlier than 1976

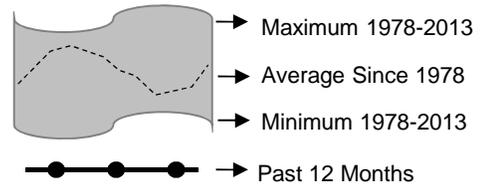
Additional wells courtesy of SJRWMD and USGS



Inset: February 2014 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
- Record High Level
- District Boundary

Figure 11: Monthly Groundwater Level Statistics
 Levels April 1, 2013 through March 31, 2014
 Period of Record Beginning 1978



Upper Floridan Aquifer Elevation above NGVD 1929, Feet

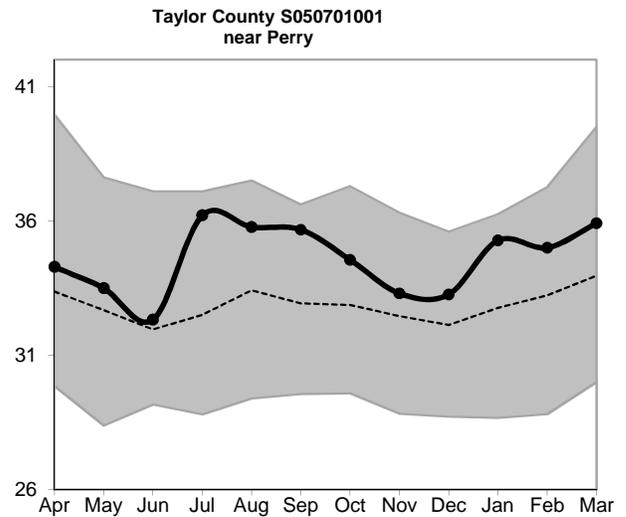
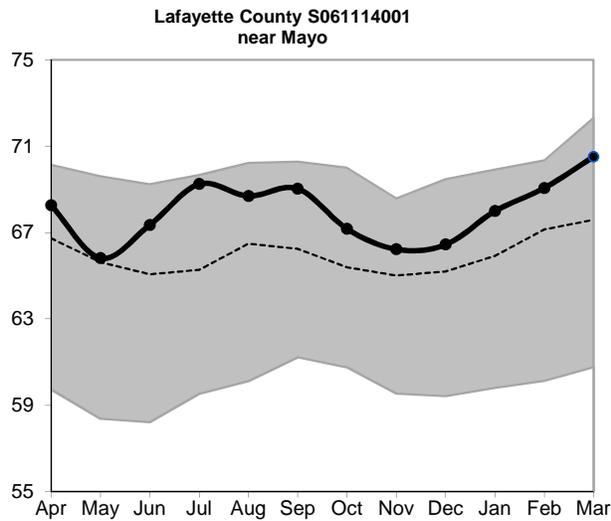
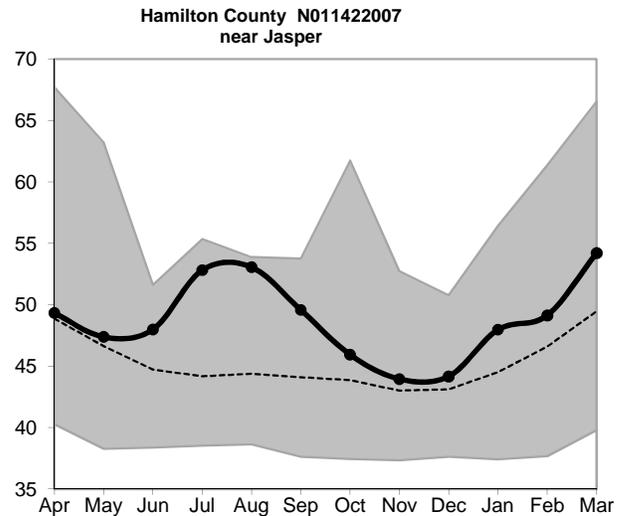
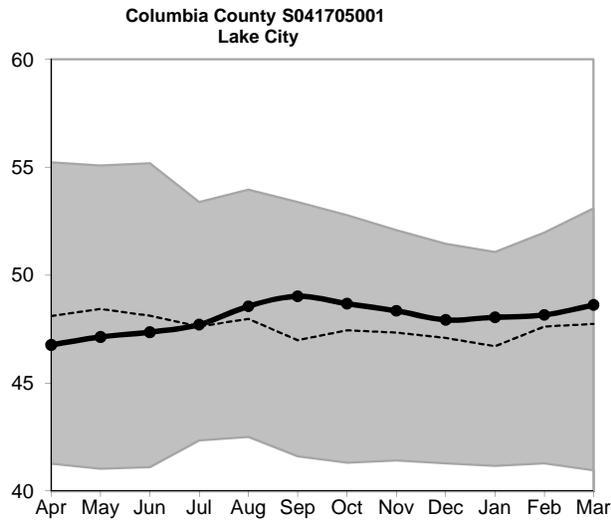
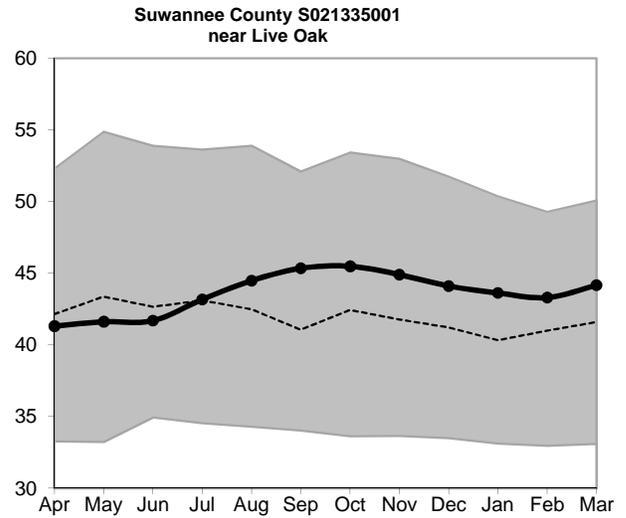
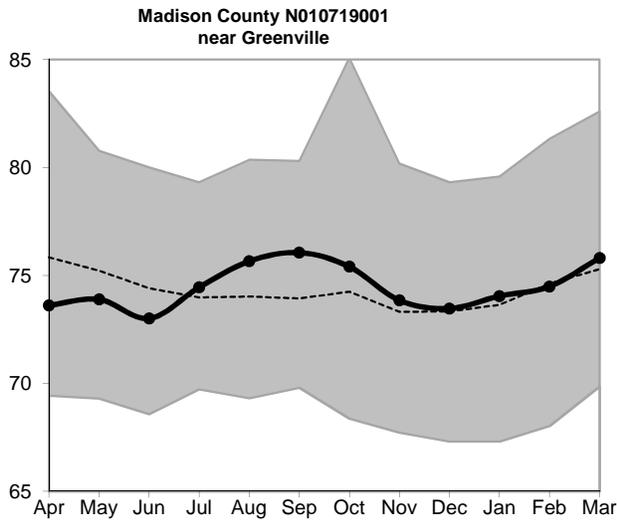
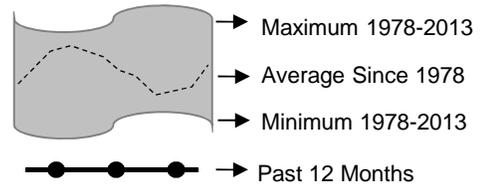
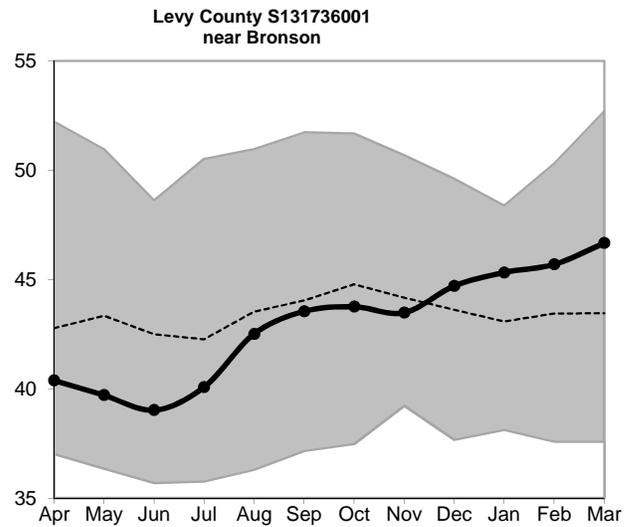
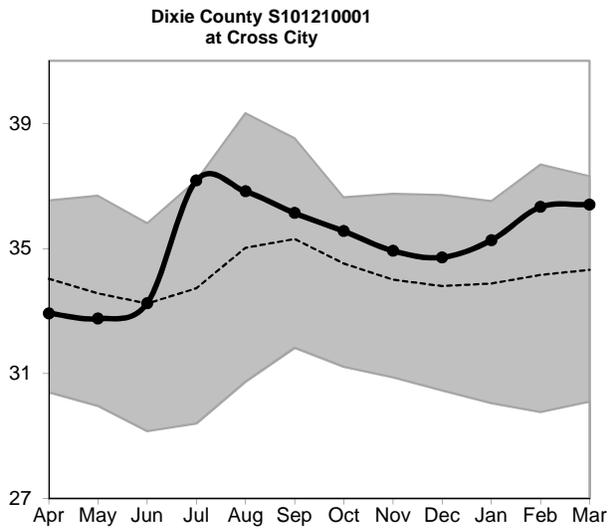
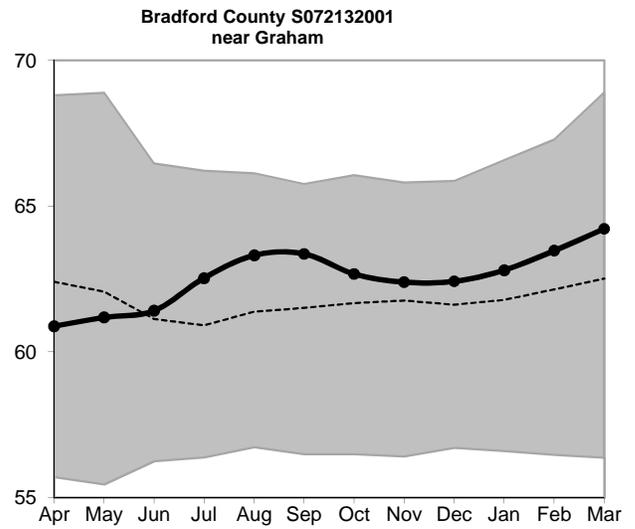
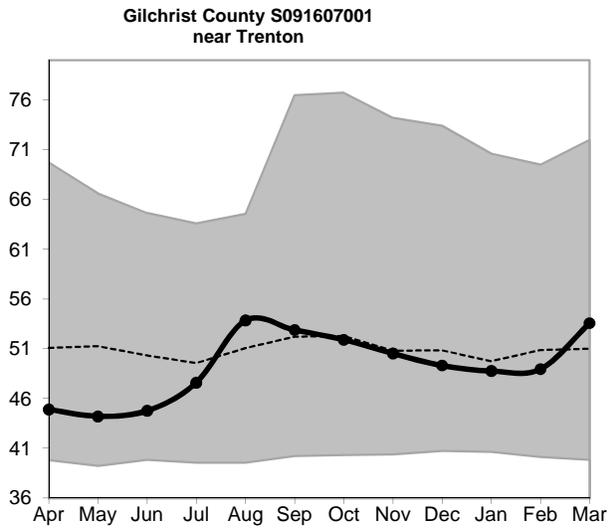
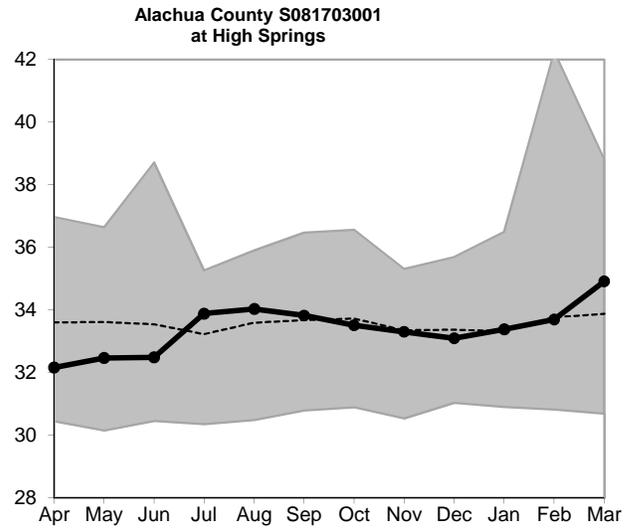
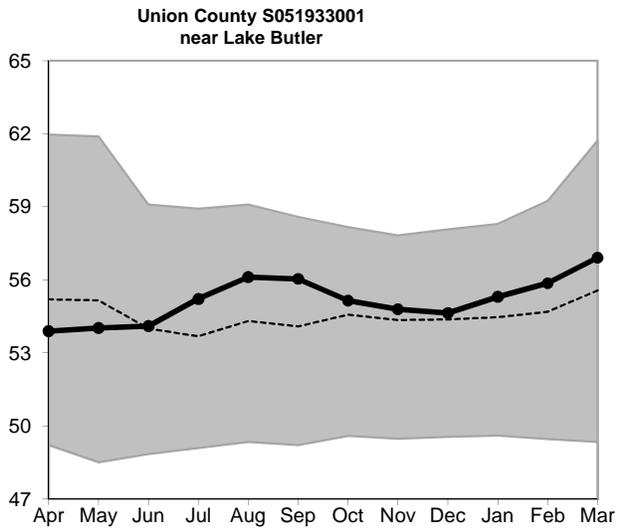
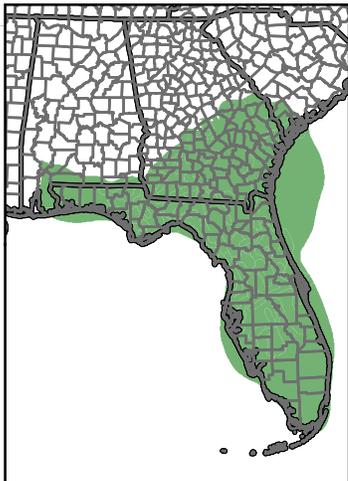
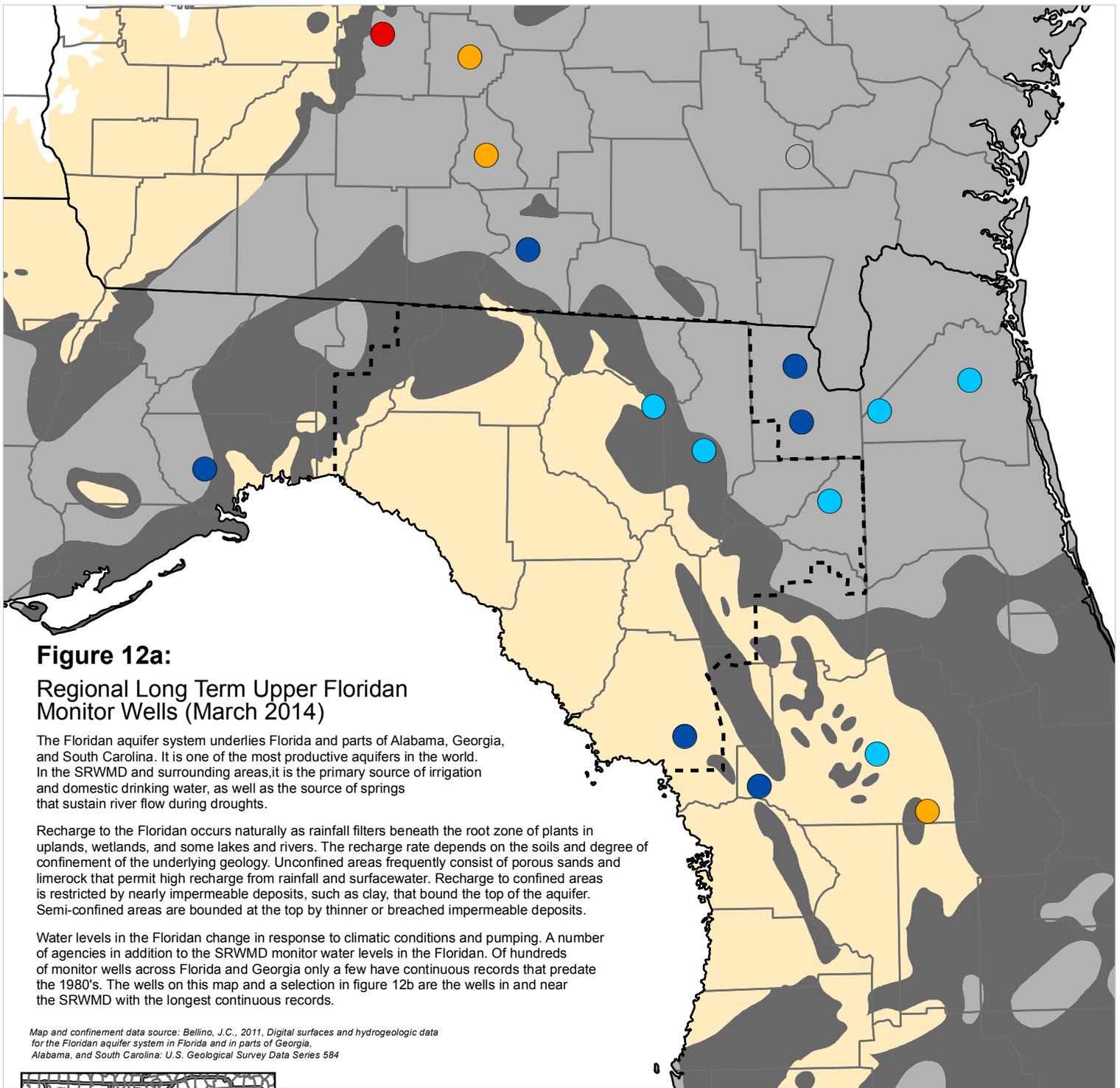


Figure 11, cont.: Groundwater Level Statistics
 Levels April 1, 2013 through March 31, 2014
 Period of Record Beginning 1978



Upper Floridan Aquifer Elevation above NGVD 1929, Feet





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

March 2014

