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: February 6, 2013

RE: January 2013 Hydrologic Conditions Report for the District

RAINFALL

- Average rainfall was 0.82", which is 22% of the long-term January average of 3.69". This was the driest January since 1950, and the fourth driest since 1932. Levy County had just 10% of normal rainfall (Table 1, Figure 1). The month's total recorded at the Usher Tower gage near Chiefland was the lowest since 1974. The highest accumulations occurred in a narrow band from Steinhatchee to Starke, with isolated totals up to 2.2" (Figure 2). The lowest gaged monthly total was 0.37" at Santa Fe Lake, and the highest was 1.85" at O'Leno State Park. The upper Withlacoochee and Alapaha basins in Georgia were also abnormally dry, with most of the area receiving less than 25% of normal rainfall (Figure 3).
- Average rainfall for the 12 months ending January 31 was 3.87" higher than the long-term average of 54.61". This surplus is the result of a wide range of accumulation, with areas in the central part of the District seeing 30"-40" more than the northern and southern areas in the last year (Figure 4). Northern Jefferson County had a deficit near 20". Total rainfall from November through January was 42% of the long-term average and the lowest since 1950, based on records beginning in 1932. Figure 5 shows the history of rainfall deficits beginning in 1932.

SURFACEWATER

- **Rivers:** Levels at all gages fell throughout January. Georgia tributaries ended the month with conditions in the lowest 10 percent of January records, considered much below normal. Suwannee, Santa Fe, and most coastal river gages were below normal. Statistics for a number of rivers are presented graphically in Figure 6, and conditions relative to historic conditions for the time of year are in Figure 7.
- **Lakes**: Levels at most monitored lakes remained stable with an average drop of less than 1", although Alligator Lake in Lake City fell by nearly 6". Eight of 14 lakes were lower than average. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for monitored lakes.

SPRINGS

Flows at monitored springs fell in January. Flow at the Ichetucknee River fell slowly but was still the highest seen in 7 years. A measurement made at the Alapaha Rise on the Suwannee River in mid-January was near its long-term median. The flow on that day was 20% of the total flow of the upper Suwannee, as measured at Ellaville. Statistics for a representative sample of springs are shown in Figures 9a and 9b.

GROUNDWATER

Levels in 75% percent of monitored upper Floridan aquifer wells dropped in January, falling by an average of 7". Levels remained stable in Baker County, and were stable or rose slightly in Hamilton County. Levels district-wide fell from the 41st percentile to the 37th (based on records beginning no earlier than 1978). Eighty-six percent of monitored levels were below median, up from 71% in December. Levels in two wells in northern Jefferson County that have been below the 10th percentile since summer of 2011 continued to fall. Only two wells remained above the 75% percentile in an area in Lafayette County that received a typical year's worth of rain between June and August 2012. 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 February 2 indicated mild drought in north Florida and moderate drought in south central Georgia.
- The U.S. Geological Survey categorized all District rivers and Georgia tributaries as below normal, based on a comparison of 7-day average streamflow to historical streamflow for January 31.
- The National Weather Service Climate Prediction Center (CPC) three-month outlook indicated a probability of below-normal precipitation through April in north Florida.
- The U.S. Seasonal Drought Outlook issued on January 17 showed persistent drought in south Georgia and development of drought in north Florida through at least April 30.

CONSERVATION

A Phase I Water Shortage Advisory remains in effect. Users are urged to eliminate unnecessary uses. Landscape irrigation is limited to once per week between November and March 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 or by request.

Table 1: Estimated Rainfall Totals

County	Jan 2013	January Average	Month % of Normal	Last 12 Months	Annual % of Normal
Alachua	0.52	3.39	15%	58.87	115%
Baker	0.93	3.48	27%	58.98	118%
Bradford	1.22	2.90	42%	59.98	118%
Columbia	1.12	3.43	33%	63.18	123%
Dixie	0.81	3.54	23%	56.13	95%
Gilchrist	0.81	4.58	18%	57.28	100%
Hamilton	0.80	4.31	19%	53.01	101%
Jefferson	0.96	4.35	22%	49.16	81%
Lafayette	0.95	4.09	23%	69.26	122%
Levy	0.38	3.99	10%	55.17	93%
Madison	0.85	3.93	22%	54.15	96%
Suwannee	0.82	4.20	19%	67.74	128%
Taylor	0.82	4.10	20%	59.10	99%
Union	1.55	4.00	39%	57.53	107%

January 2013 Average:	0.82
January Average (1932-2012):	3.69
Historical 12-month Average (1932-2012):	54.61
Past 12-Month Total:	58.48
12-Month Rainfall Surplus:	3.87

Figure 1: Comparison of District Monthly Rainfall

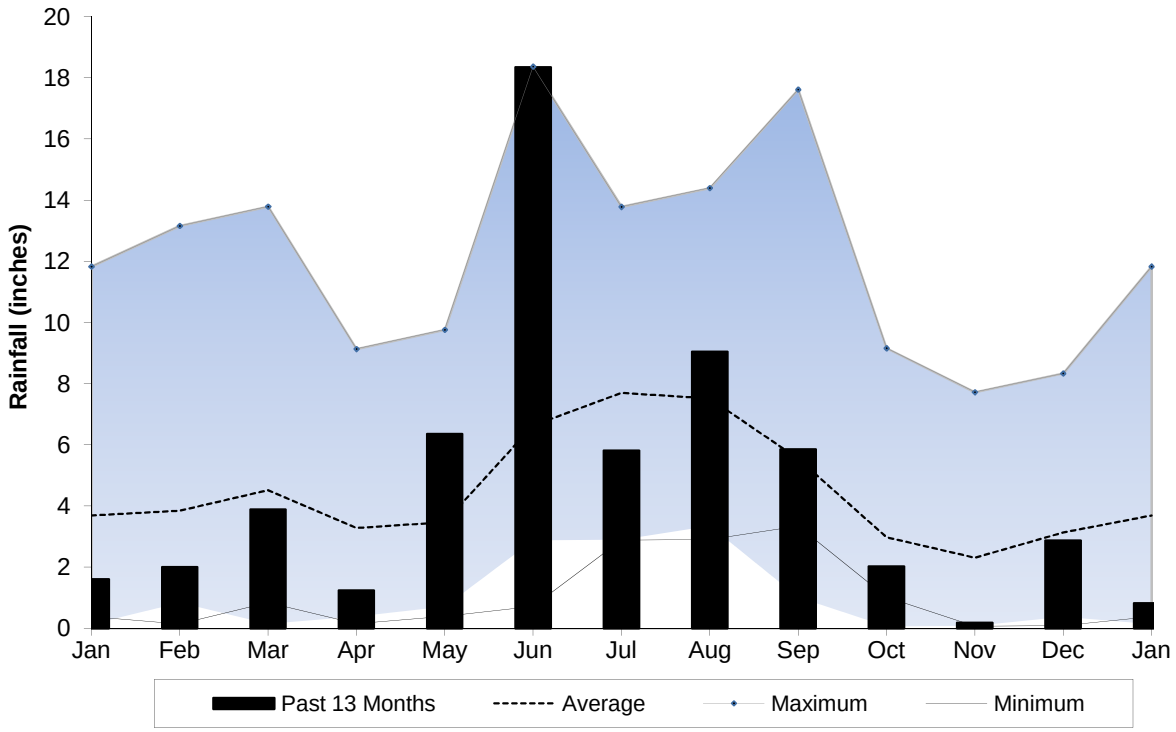


Figure 2: January 2013 Rainfall Estimate

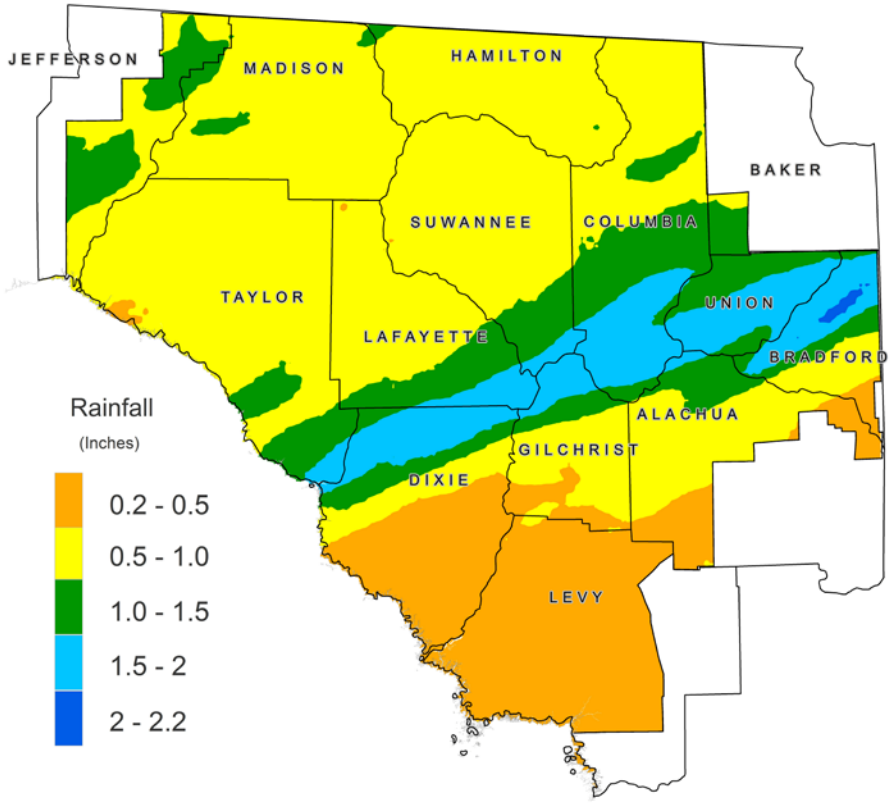


Figure 3: January 2013 Percent of Normal Rainfall

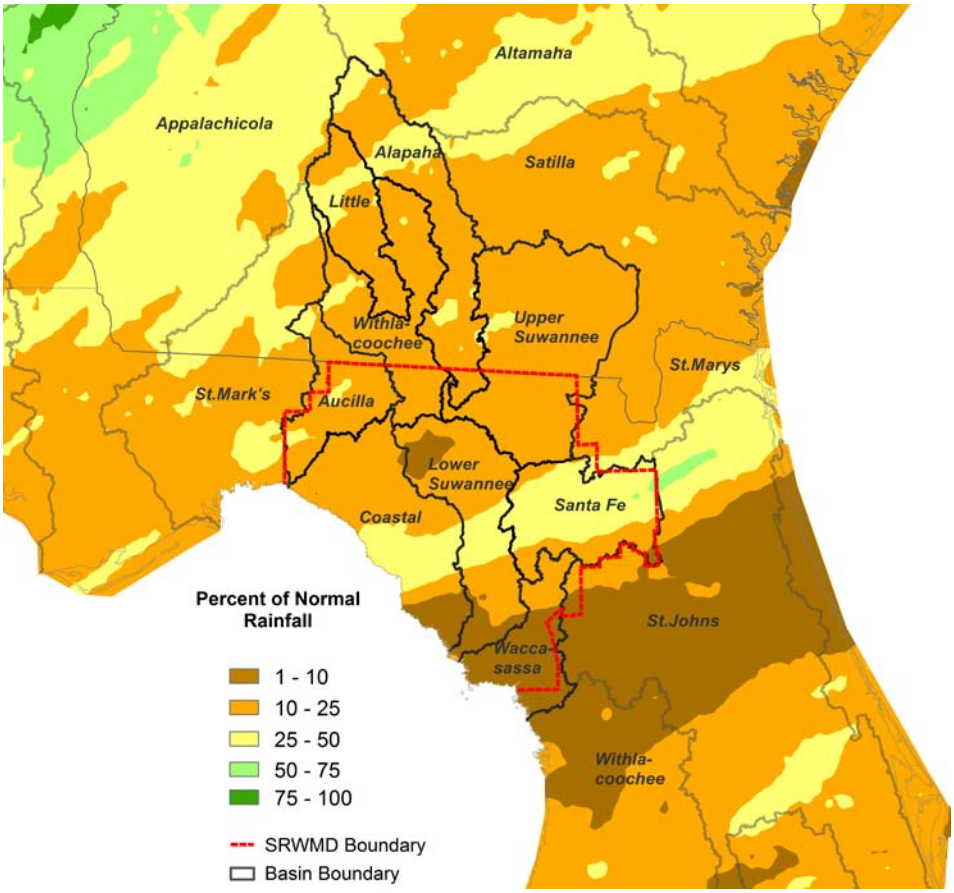


Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin
Through January 31, 2013

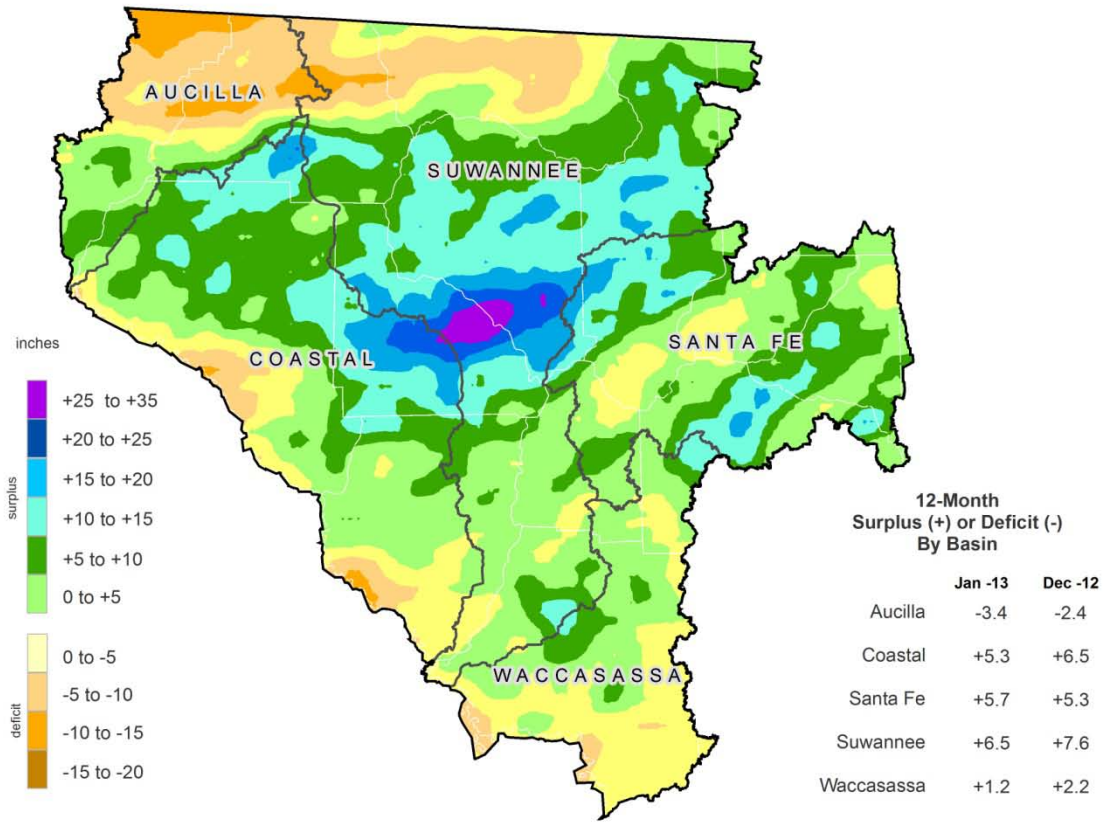


Figure 5: 12-Month Rolling Rainfall Deficit Since 1932

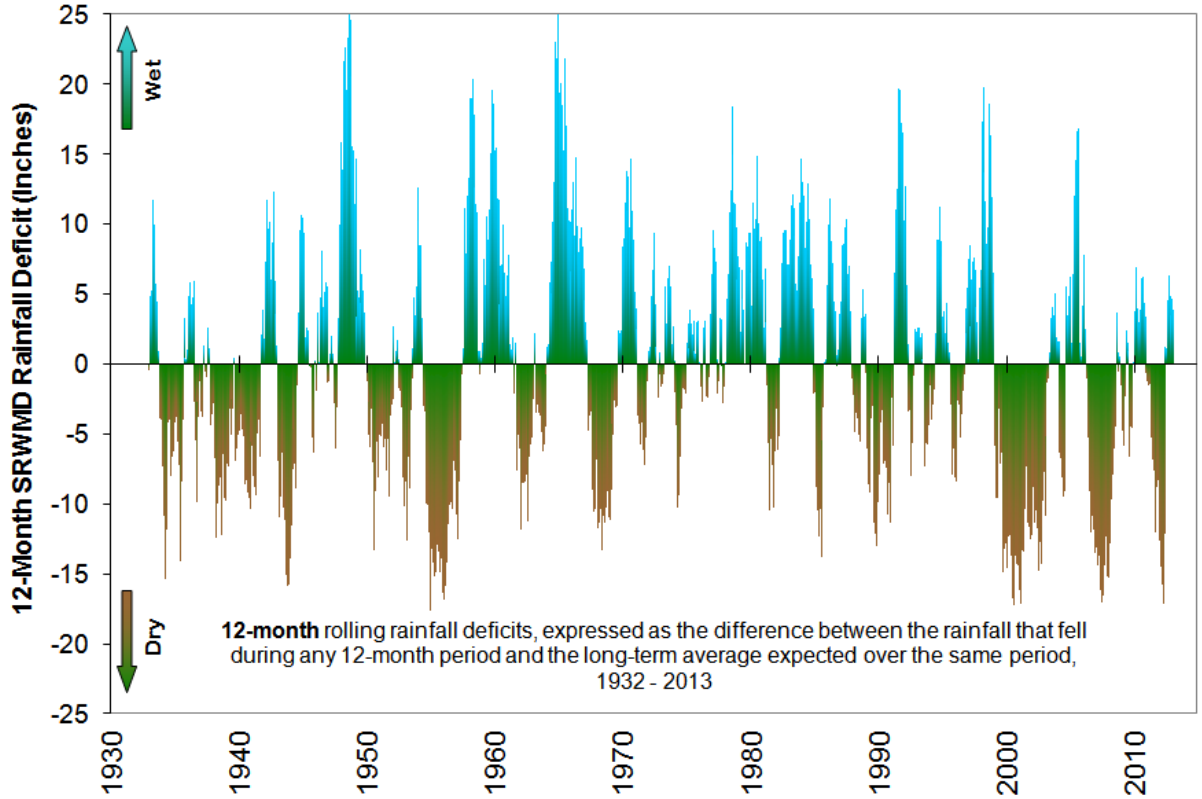


Figure 6: Daily River Flow Statistics
February 1, 2012 through January 31, 2013

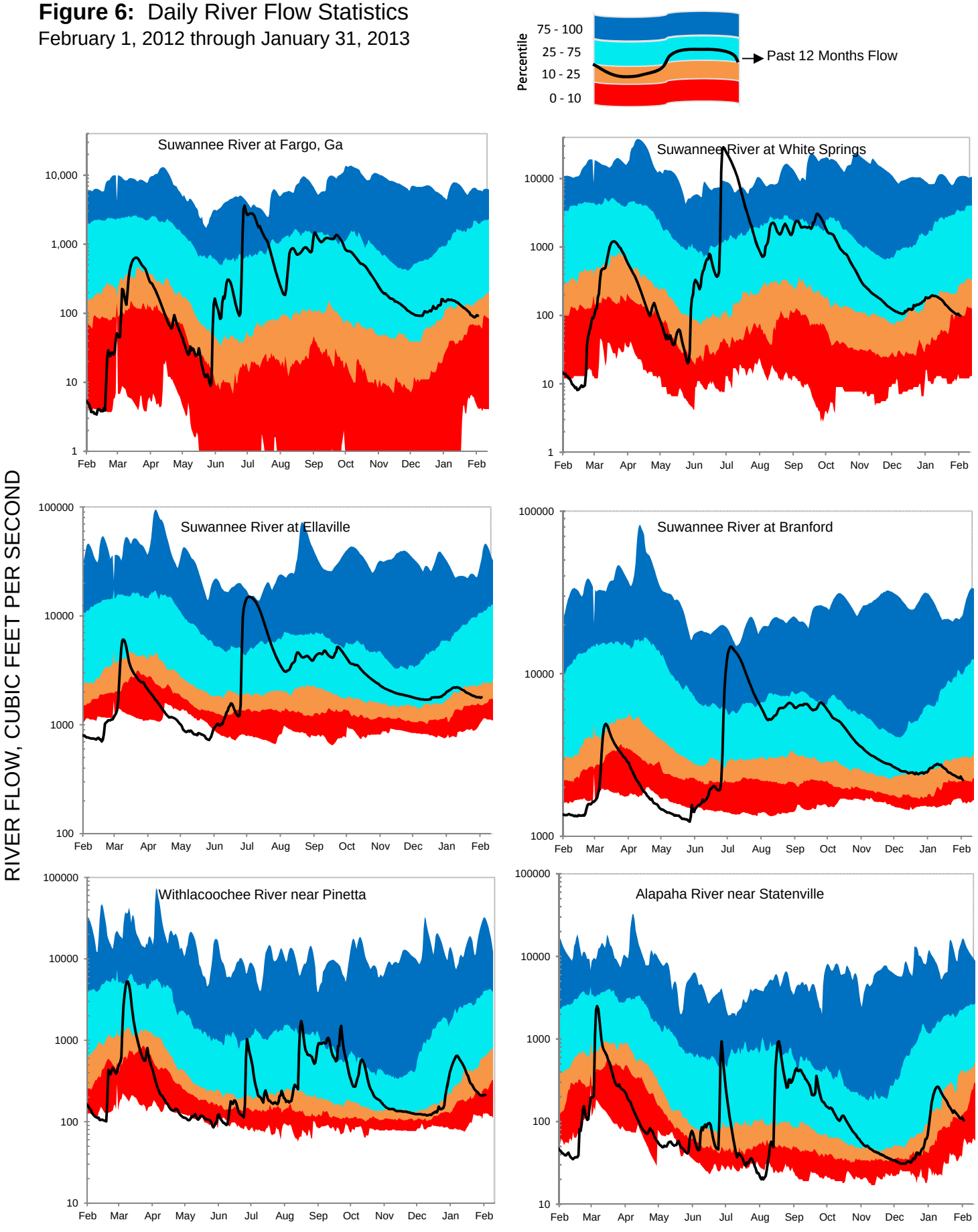
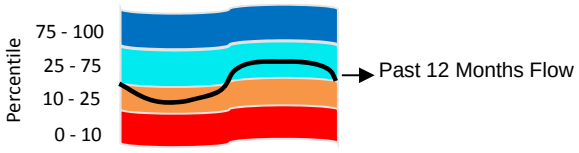
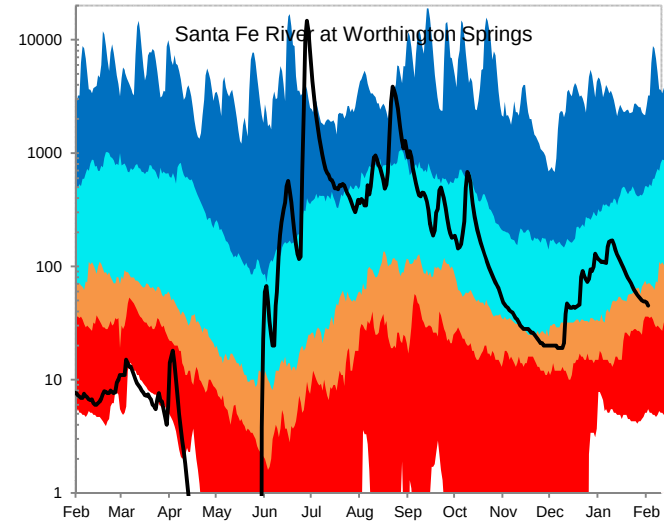
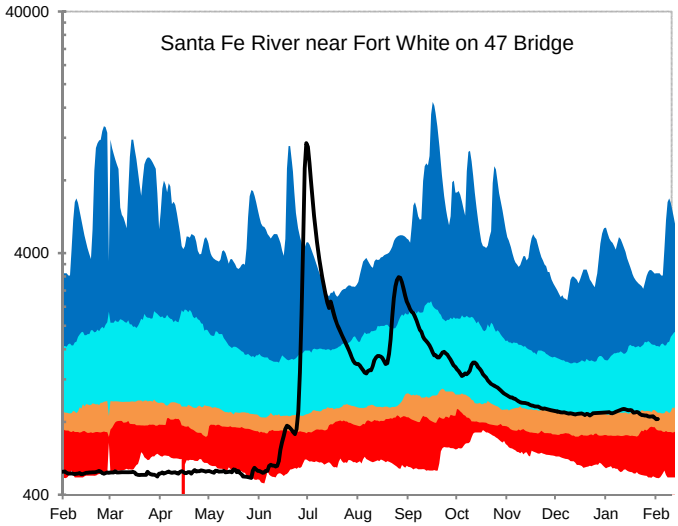


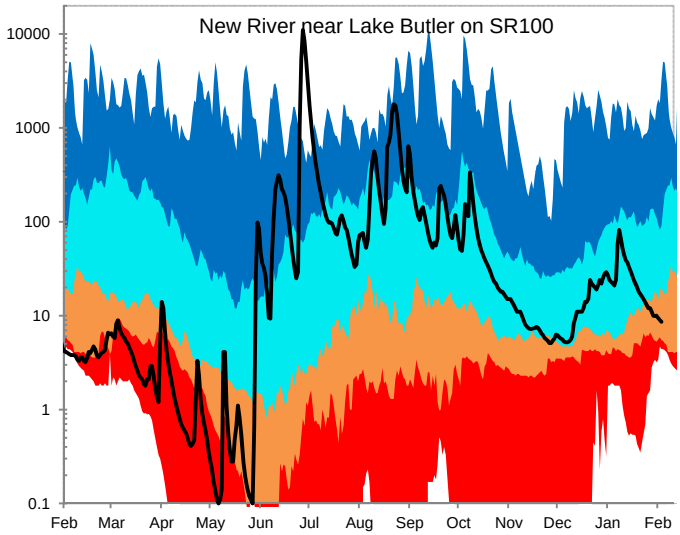
Figure 6, cont: Daily River Flow Statistics
February 1, 2012 through January 31, 2013

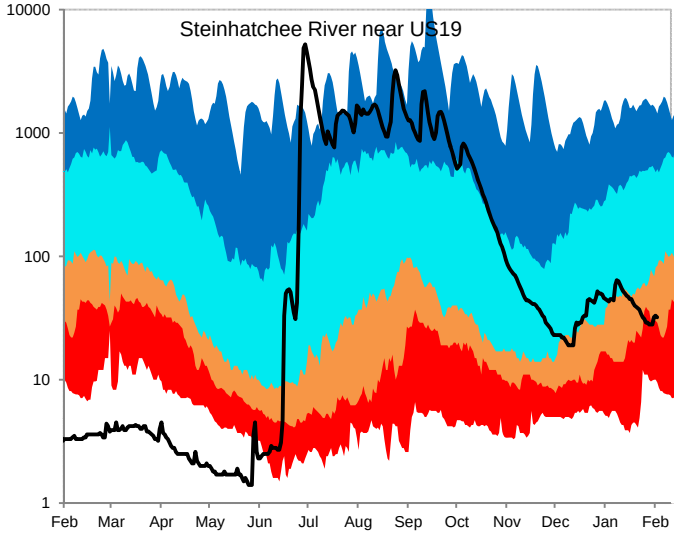


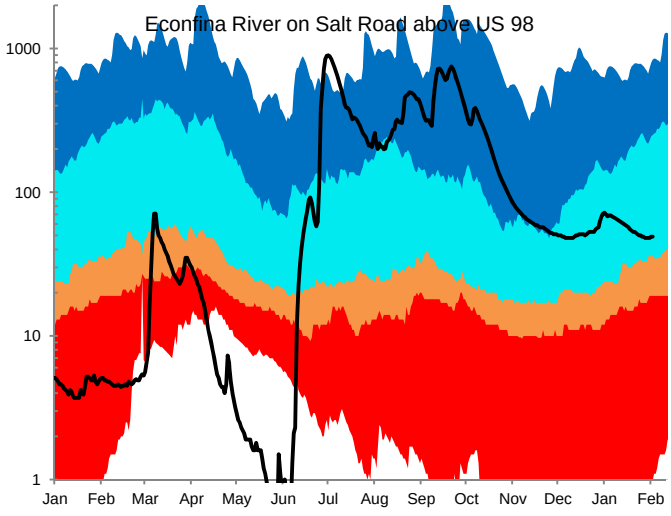
RIVER FLOW, CUBIC FEET PER SECOND

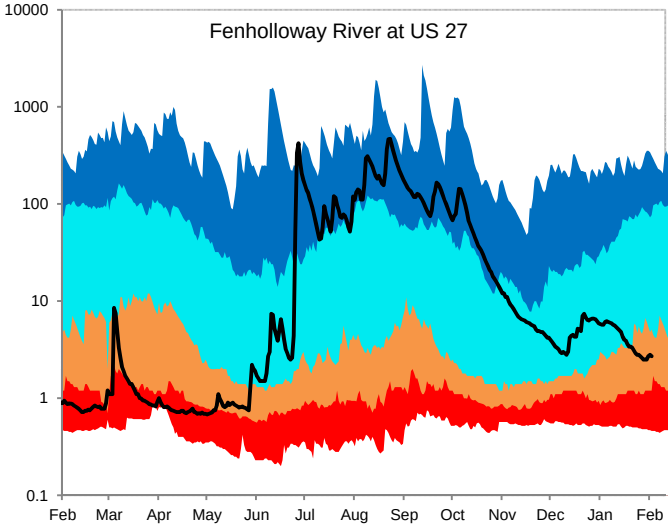












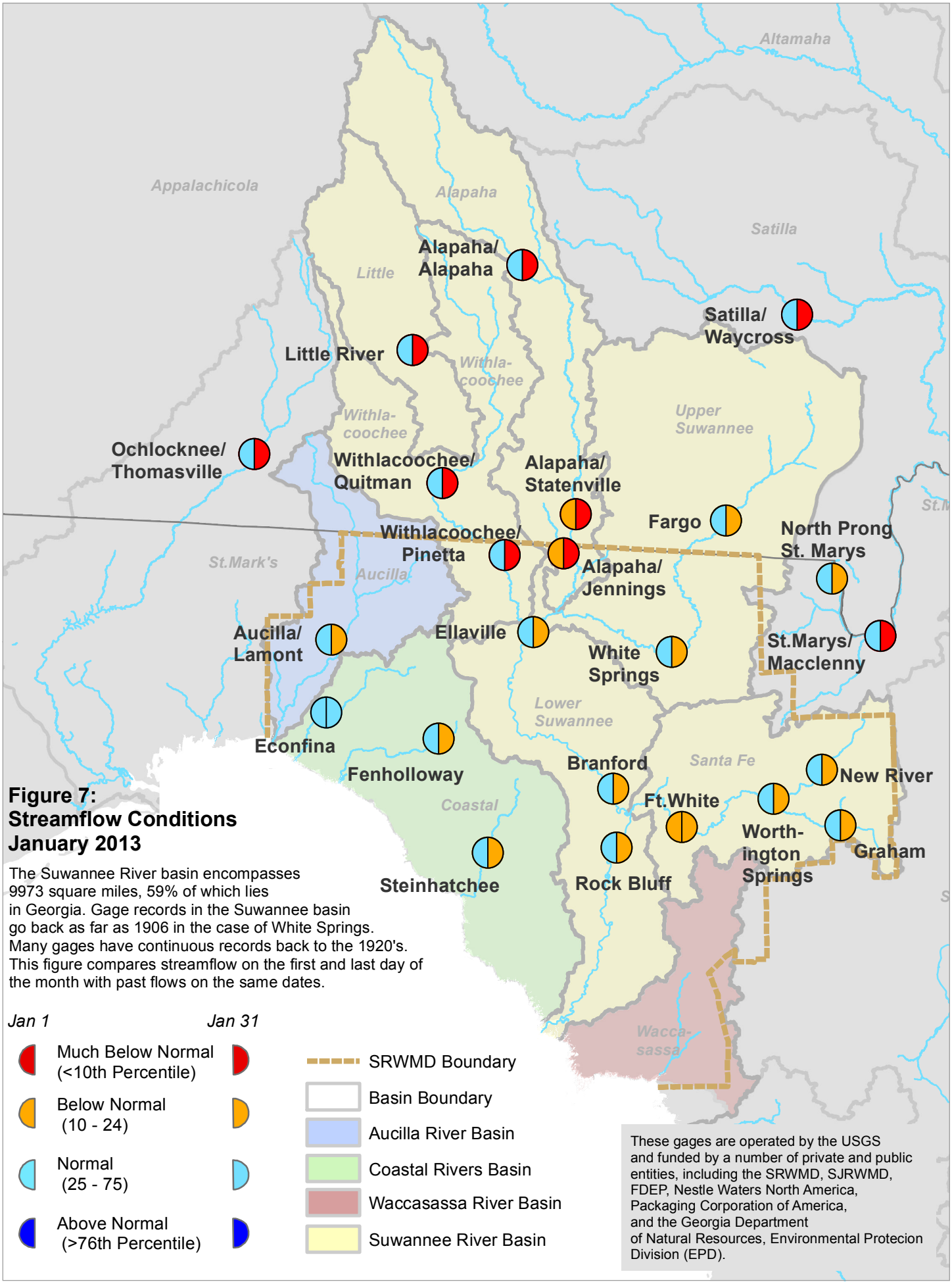
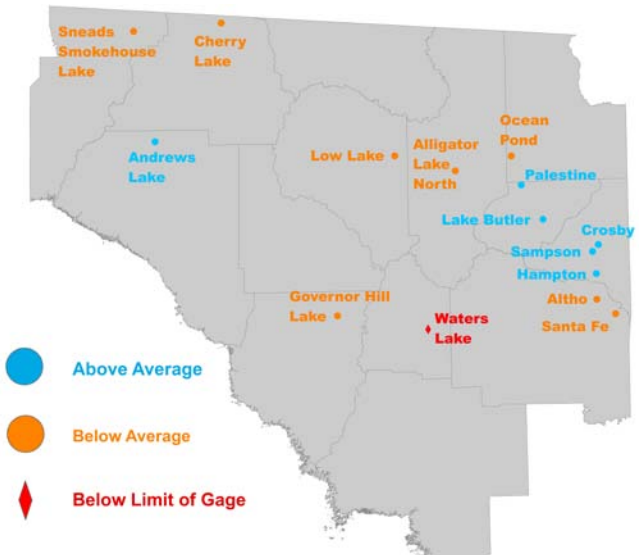


Figure 7:
Streamflow Conditions
January 2013

The Suwannee River basin encompasses 9973 square miles, 59% of which lies in Georgia. Gage records in the Suwannee basin go back as far as 1906 in the case of White Springs. Many gages have continuous records back to the 1920's. This figure compares streamflow on the first and last day of the month with past flows on the same dates.

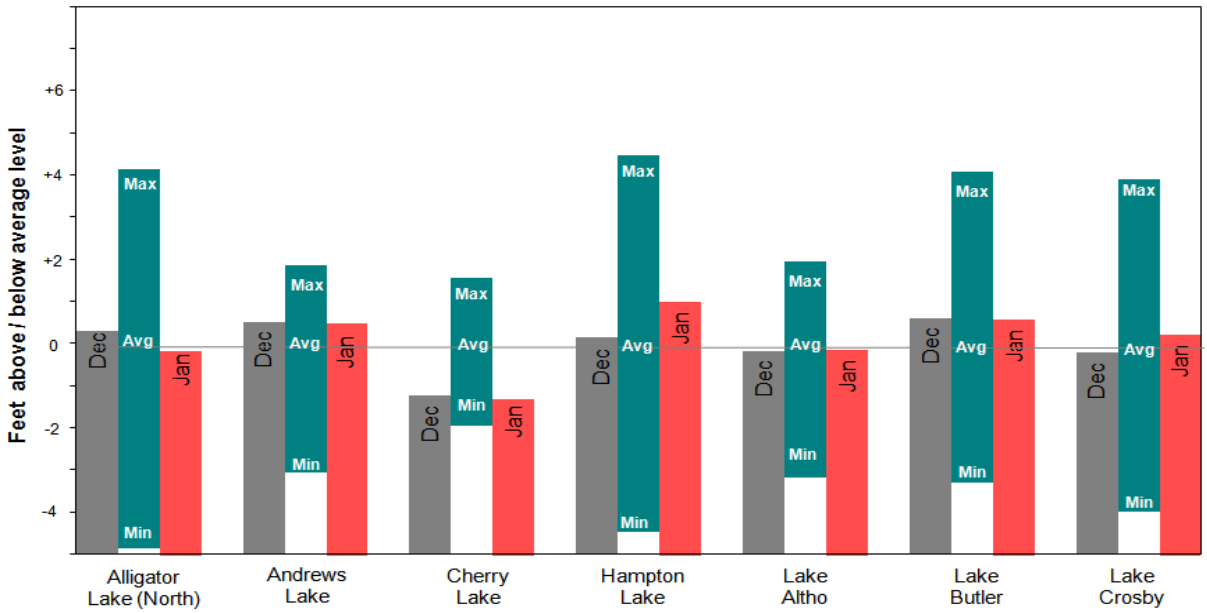
These gages are operated by the USGS and funded by a number of private and public entities, including the SRWMD, SJRWMD, FDEP, Nestle Waters North America, Packaging Corporation of America, and the Georgia Department of Natural Resources, Environmental Protecion Division (EPD).

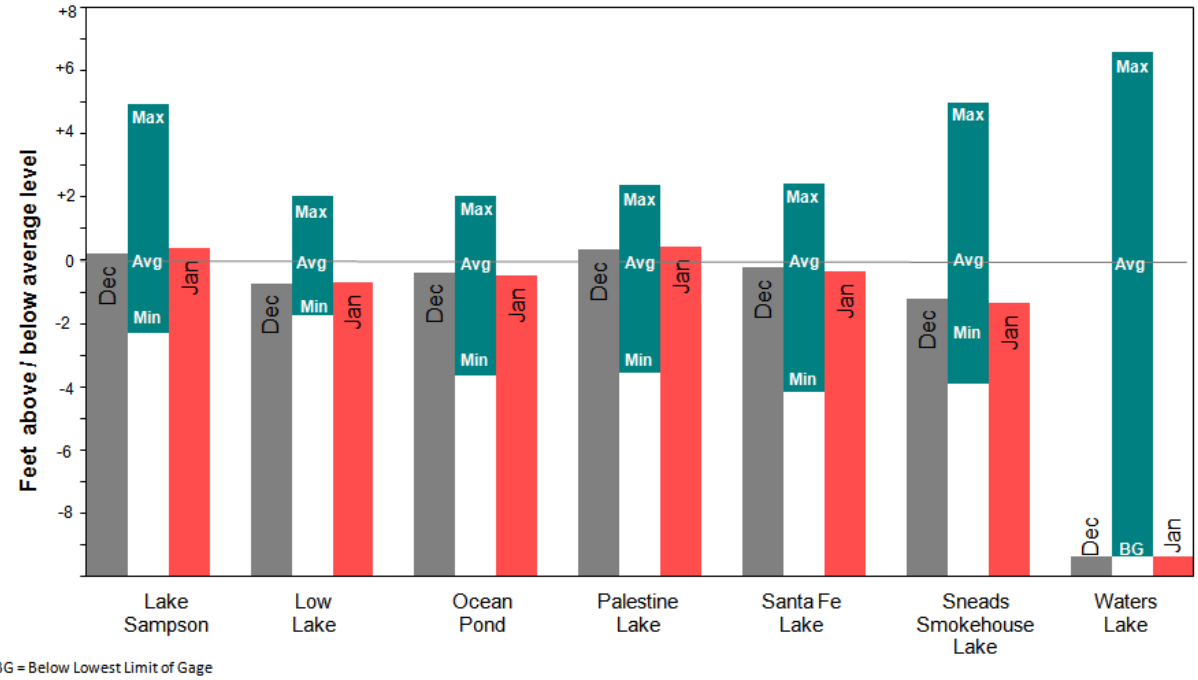
Figure 8: January 2013 Lake Levels



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.

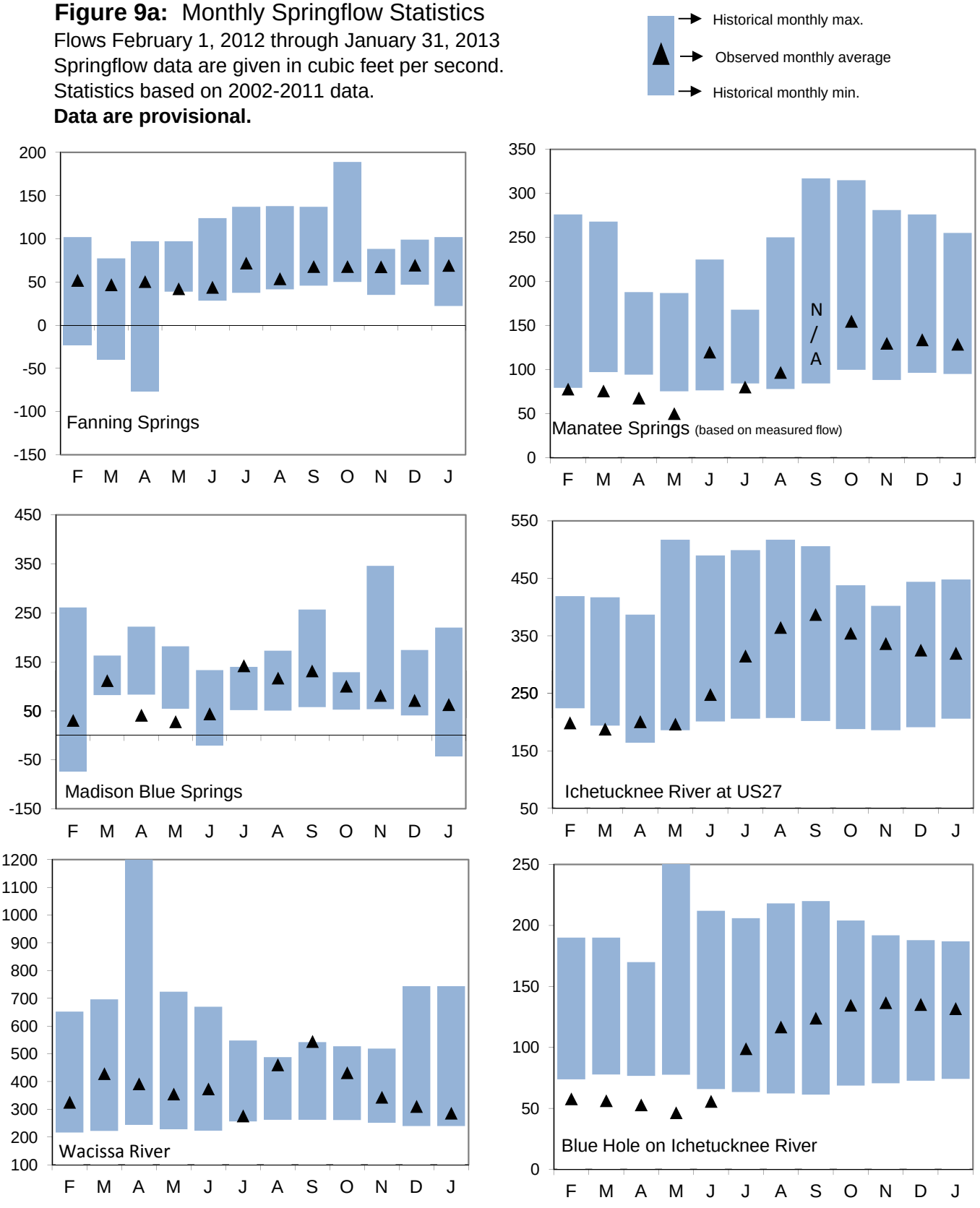
The District monitors 15 lakes with much of the data provided by volunteer observers. Most records go back to the 1970s, although the Sampson Lake record starts in 1957.





BG = Below Lowest Limit of Gage

Figure 9a: Monthly Springflow Statistics
Flows February 1, 2012 through January 31, 2013
Springflow data are given in cubic feet per second.
Statistics based on 2002-2011 data.
Data are provisional.

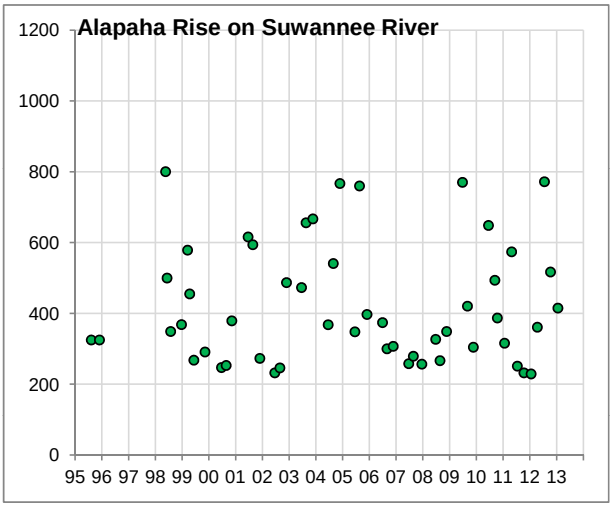


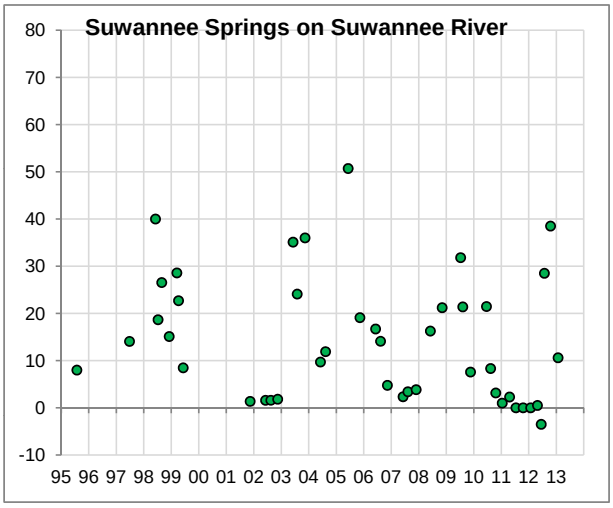
Note: Rising river levels caused by high tides or flooding can cause springflow to slow or reverse.
Springflow for months marked by an asterisk (*) was strongly affected by river conditions.
Data will be revised once approved and published by the U.S. Geological Survey.

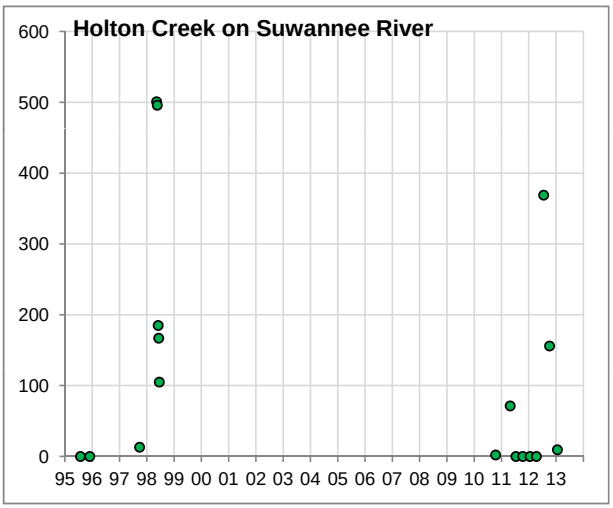
Figure 9b: Quarterly Springflow Measurements

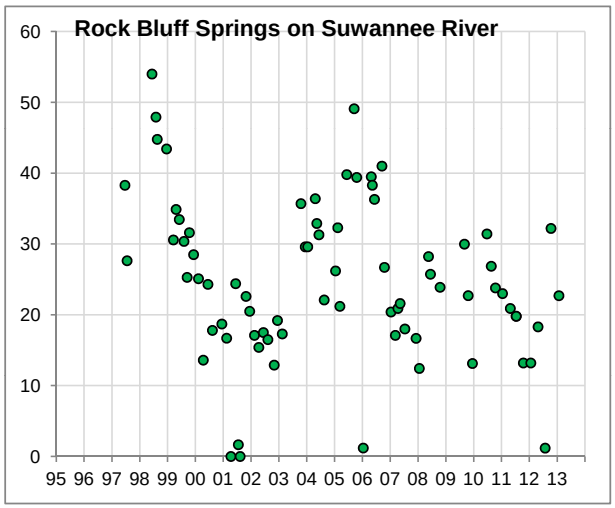
The SRWMD monitors water quality at 30 springs. Flow is measured at the time of the sampling. The springs below were sampled in January 2013. Flow is given in cubic feet per second.

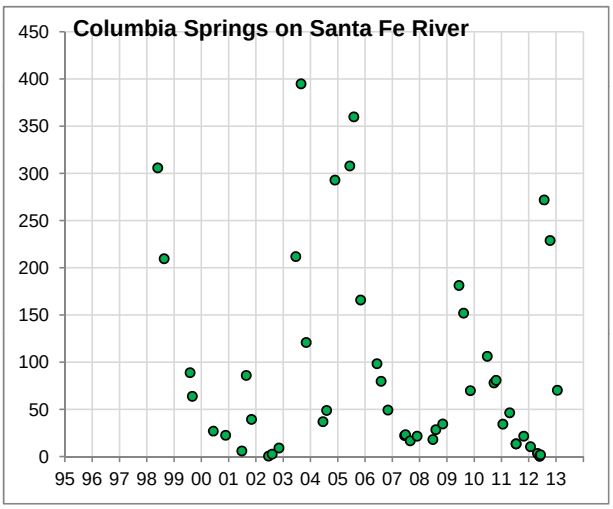
Spring flow is greatly affected by river levels. Rising river levels or high tides can slow spring flow or even reverse it. Some low flows in this data may not be representative of drought conditions.

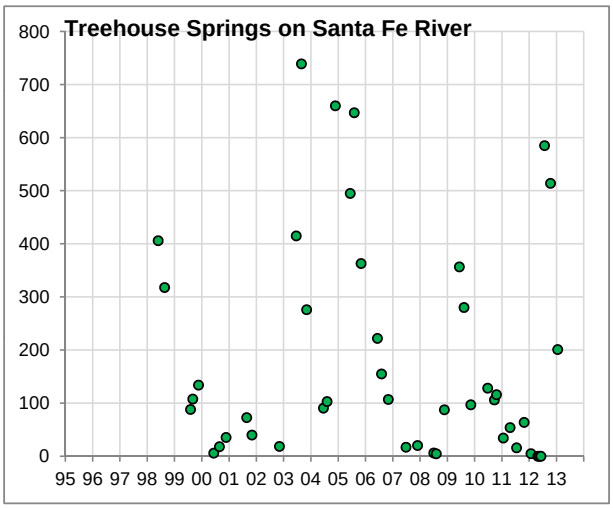












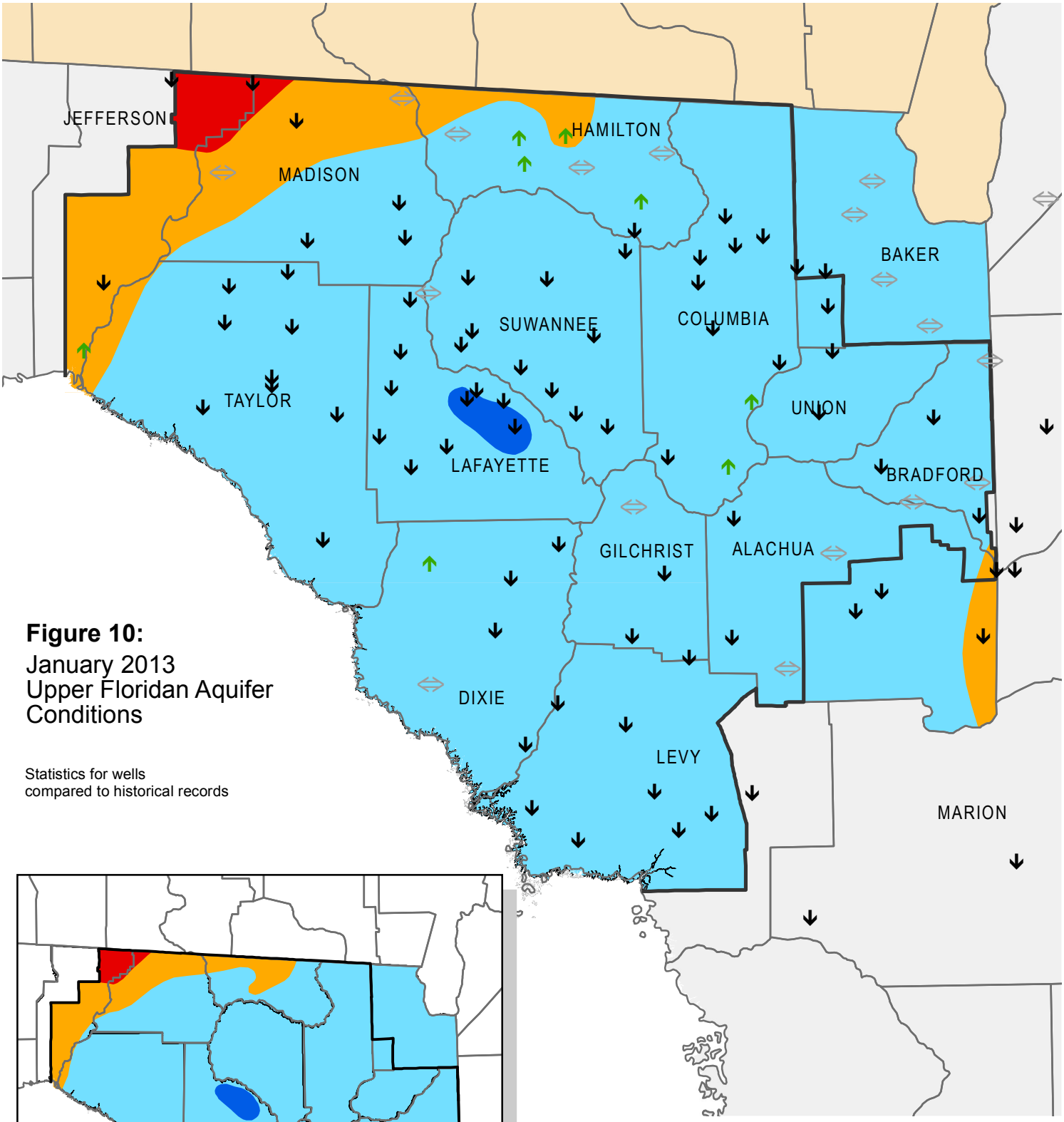
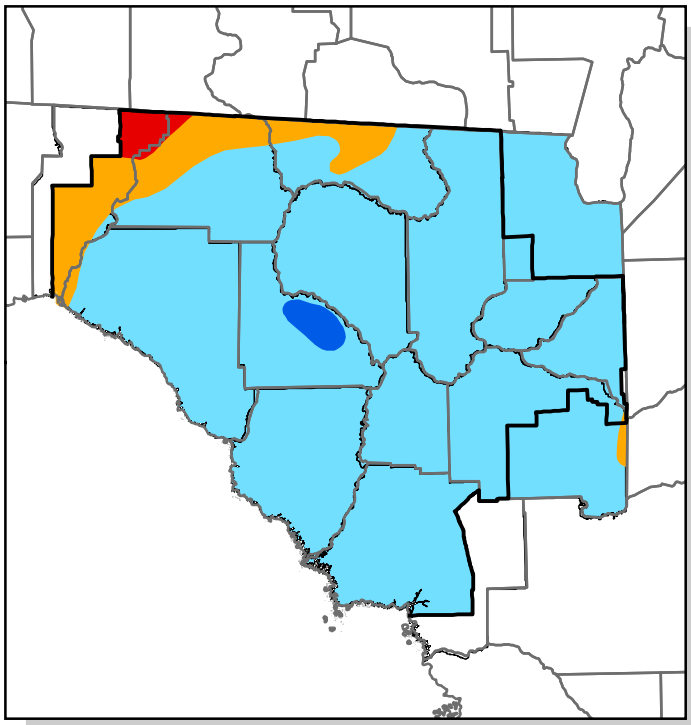


Figure 10:
January 2013
Upper Floridan Aquifer
Conditions

Statistics for wells
compared to historical records



Inset: December 2012 Groundwater Levels

High
(Greater than 75th Percentile)

Normal
(25th to 75th Percentile)

Low
(10th to 25th Percentile)

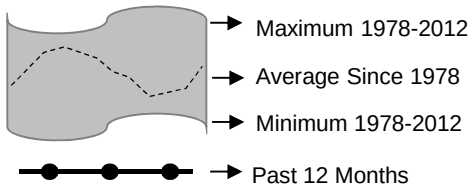
Extremely Low
(Less than 10th Percentile)

Increase/decrease in level since last month

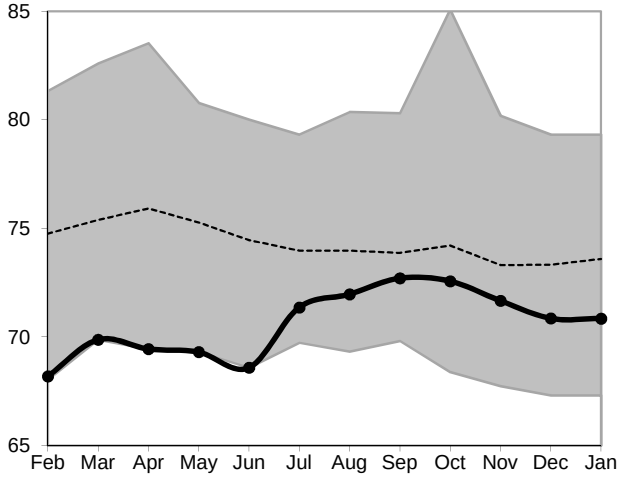
Increase/decrease since last month
less than one percent of historic range

District Boundary

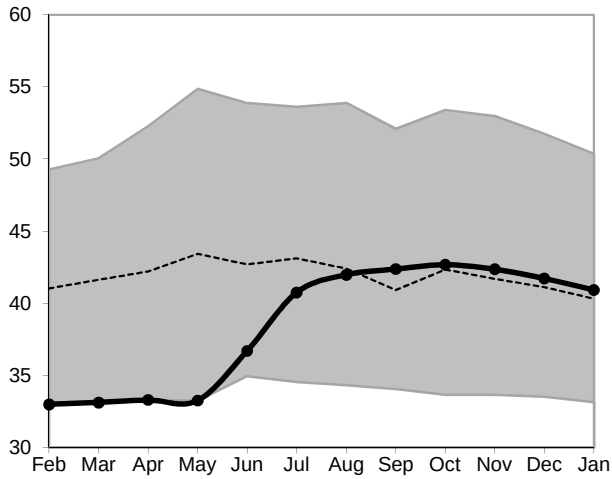
Figure 11: Monthly Groundwater Level Statistics
Levels February 1, 2012 through January 31, 2013
Period of Record Beginning 1978
Datum is NGVD 1929



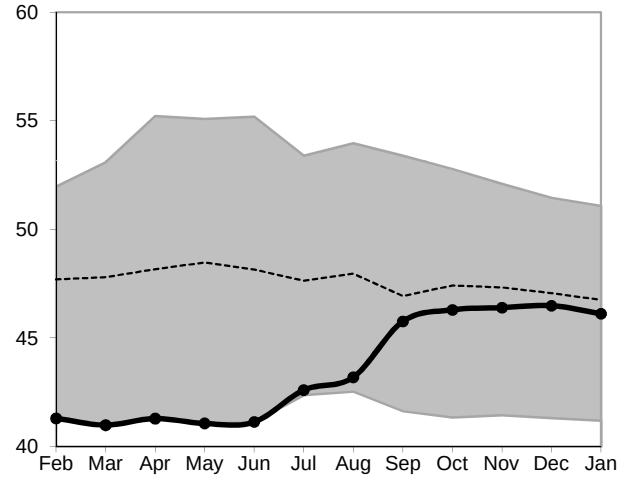
Madison County N010719001
near Greenville



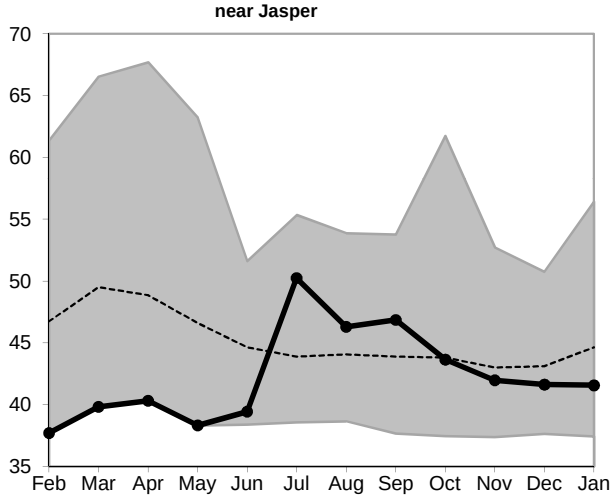
Suwannee County S021335001
near Live Oak



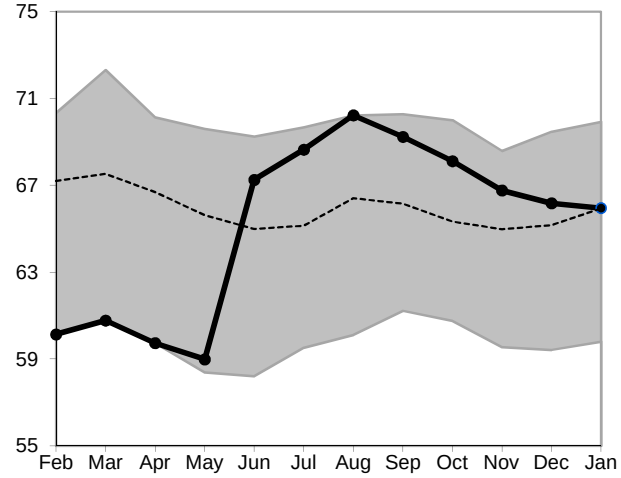
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S050701001
near Perry

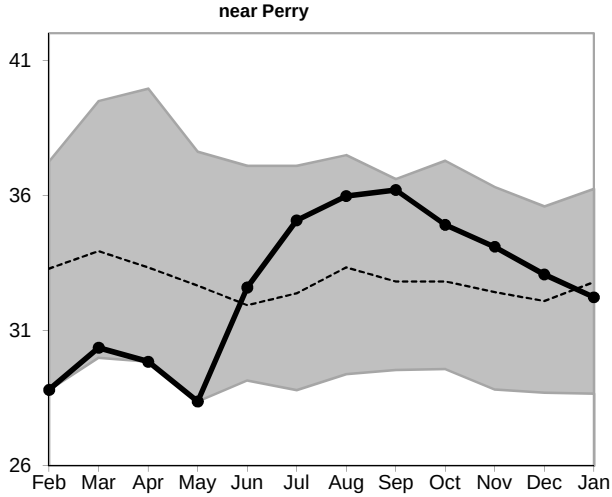
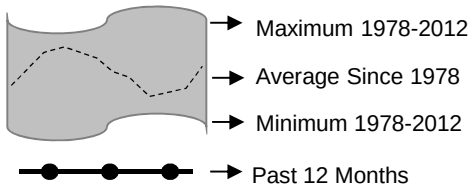
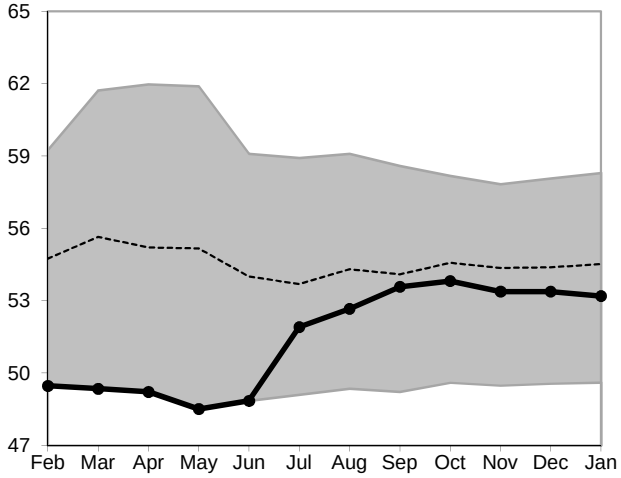


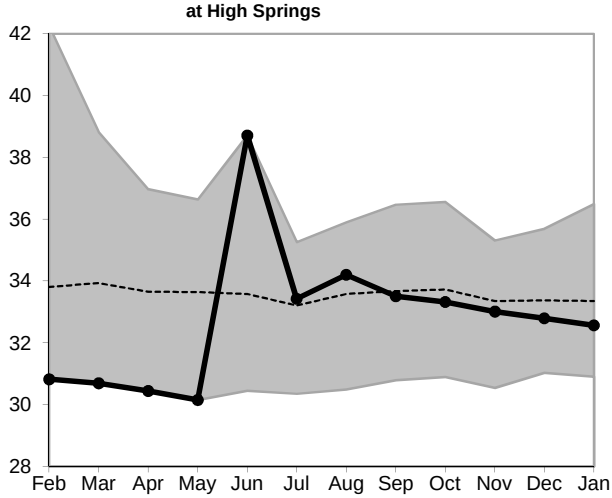
Figure 11, cont.: Groundwater Level Statistics
Levels February 1, 2012 through January 31, 2013
Period of Record Beginning 1978
Datum is NGVD 1929



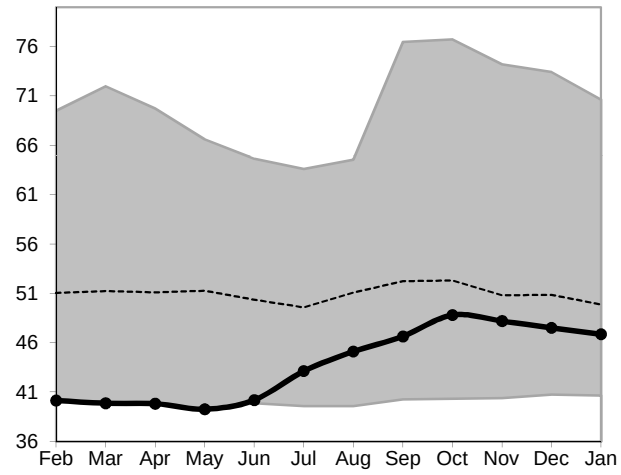
Union County S051933001
near Lake Butler



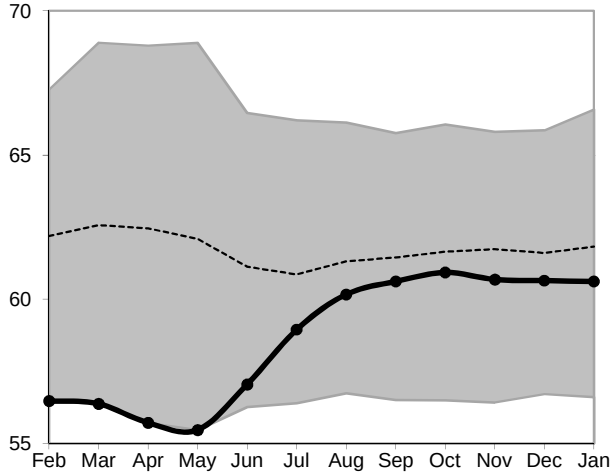
Alachua County S081703001
at High Springs



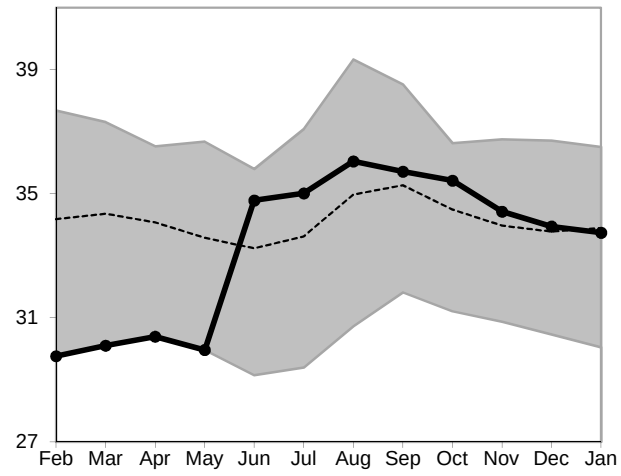
Gilchrist County S091607001
near Trenton



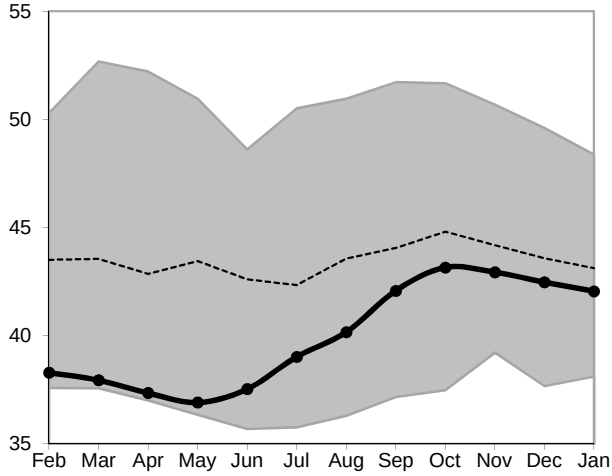
Bradford County S072132001
near Graham



Dixie County S101210001
at Cross City



Levy County S131736001
near Bronson



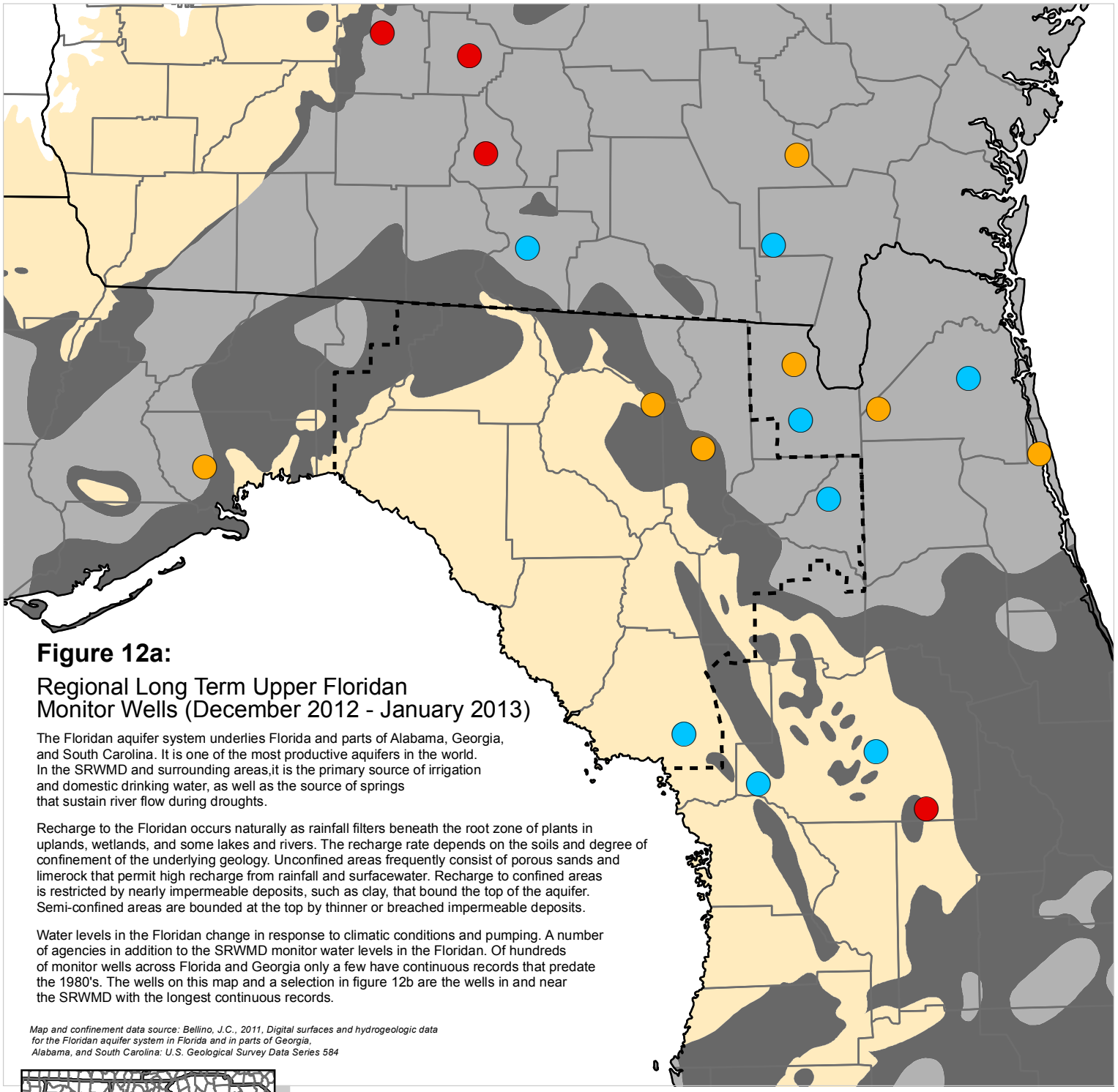


Figure 12a:

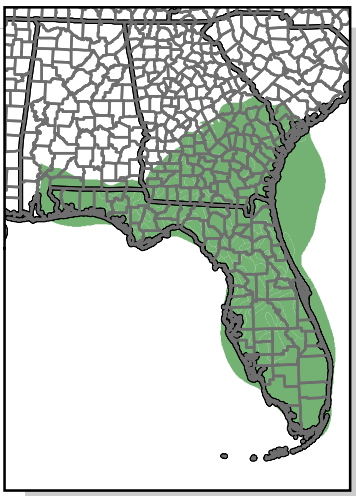
Regional Long Term Upper Floridan Monitor Wells (December 2012 - January 2013)

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

Occurence 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

January 2013

Upper Floridan Aquifer levels in feet above mean sea level

Taylor and Sanderson wells courtesy of SJRWMD