MEMORANDUM

TO: Governing Board

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

THRU: Charles Houder, Acting Executive Director CH.
Jon Dinges, Department Director JND

DATE: May 5, 2012

RE: April 2012 Hydrologic Conditions Report for the District

RAINFALL

- Average rainfall in April was 1.24", which is 37% of the long-term April average based on records starting in 1932 (Table 1, Figure 1). Most of the month's precipitation was due to a low pressure system that formed over the Gulf on the 21st and 22nd, causing localized accumulations of up to 4" (Figure 2). The highest gaged total in the District was 2.17" near Trenton, and the lowest was 0.31" at Cooks Hammock in southwestern Lafayette County. Most of the District and tributary basins in South Georgia had less than 50% of normal rainfall (Figure 3).
- The 12 months ending April 30 had the lowest rainfall total (37.46") of all May-April periods since 1932, and was the 3rd driest of all 12-month periods. The 12-month deficit rose to 17.1" (Figure 4). Figure 5 shows the change in annual deficits beginning in 1932. The average 3-month deficit was 4.5".

SURFACEWATER

- **Rivers**: By the end of the month flows at all gages but the Fenholloway were in the lowest 10% of April records, with most of the Suwannee gages and the Econfina and Steinhatchee rivers setting the lowest flows of all April observations. The District's gage on the Santa Fe River near High Springs fell below the 2002 record low stage by 1.5". Daily discharge statistics for six river stations are presented in Figure 6 and streamflow conditions for major gages are shown in Figure 7.
- **Lakes**: All monitored lakes were below their long-term average levels at the end of the month. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for 14 lakes.
- **Springs:** Average April flow relative to historical flows based on computed daily values is shown for 6 spring systems in Figure 9a, and flow measurements for 8 additional springs are shown in Figure 9b. Daily flow rates at the spring-fed Ichetucknee River were approximately 9% higher than record drought-induced lows observed in 2002. The flow at Poe Springs in Alachua County dropped to 16% of the previous record low flow by the end of

the month. Treehouse Spring in Alachua County, a first-magnitude spring that is a resurgence of the Santa Fe River, had no observable flow for the first time in its record. Most other springs on the Santa Fe River were near or below previous drought-induced low flows. Manatee Springs continued to set new low average monthly flows, and Fanning Springs saw the intrusion of river water during high tides because of low spring flow.

GROUNDWATER

Levels in 83% of the District's upper Floridan aquifer monitor wells fell in April, dropping by an average of 7". Eighty-four percent had levels in the bottom 10 percent of all records, considered extremely low. Seventy-one percent had levels in the bottom 5 percent of all records. Seventeen wells had record-setting lows (Figure 10). Conditions averaged across the District compared to all historic levels fell to the 5th percentile from the 9th percentile the previous month (based on records beginning no earlier than 1978). Statistics for a representative sample of wells are shown in Figure 11, and Figure 12 shows graphs of Floridan aquifer wells in or near the District with the longest continuous records.

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 during the last week of April was -4.07 in North Florida, indicating extreme drought.
- The U.S. Geological Survey categorized all District rivers and Georgia tributaries under severe hydrologic drought, with the exception of the middle- and lower- Suwannee basins, which were in extreme hydrologic drought.
- The 3-month precipitation outlook issued by the Climate Prediction Center is for equal chances of above-normal, normal, or below-normal precipitation through July. Above-normal temperatures are expected through July.

CONSERVATION

A Water Shortage Advisory is in effect. All users are strongly urged to eliminate unnecessary uses. Landscape irrigation is limited to two days per week between March and November based on a 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 (106 wells), surfacewater (35 stations), agricultural water use (106 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	Apr-2012	April Average	Last 3 Months	Last 12 Months
Alachua	1.29	3.35	6.71	37.51
Baker	1.68	3.07	7.29	36.85
Bradford	1.51	3.16	5.62	35.76
Columbia	1.16	3.10	7.40	37.49
Dixie	1.01	3.35	5.64	39.35
Gilchrist	1.19	3.58	6.48	40.22
Hamilton	1.14	3.21	8.83	35.06
Jefferson	1.43	4.04	8.45	33.44
Lafayette	0.76	3.24	6.32	35.78
Levy	1.50	3.11	5.85	38.29
Madison	1.10	3.23	10.08	40.82
Suwannee	1.33	3.24	8.24	39.72
Taylor	1.11	3.35	6.55	34.87
Union	0.92	3.65	6.27	39.82

April 2012 Average:	1.24
Historical April Average (1932-2011):	3.31
Historical 12-month Average (1932-2011):	54.56
Past 12-Month Total:	37.46
12-month Rainfall Deficit:	-17.10

(Rainfall reported in inches)

Figure 1: Comparison of District Monthly Rainfall

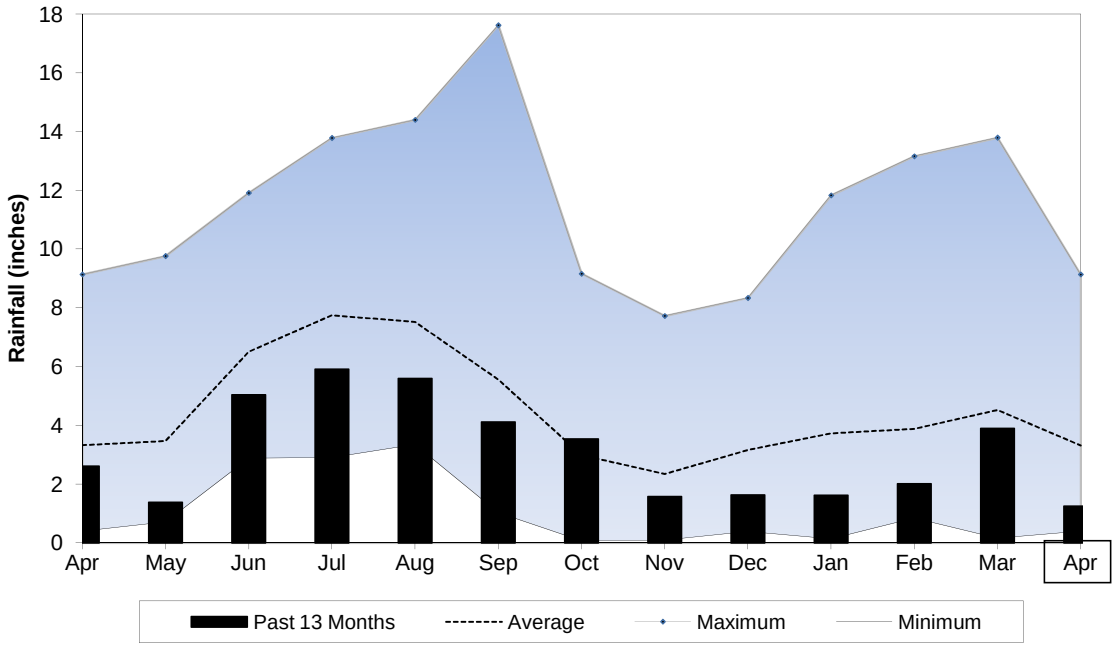


Figure 2: April 2012 Rainfall Estimate

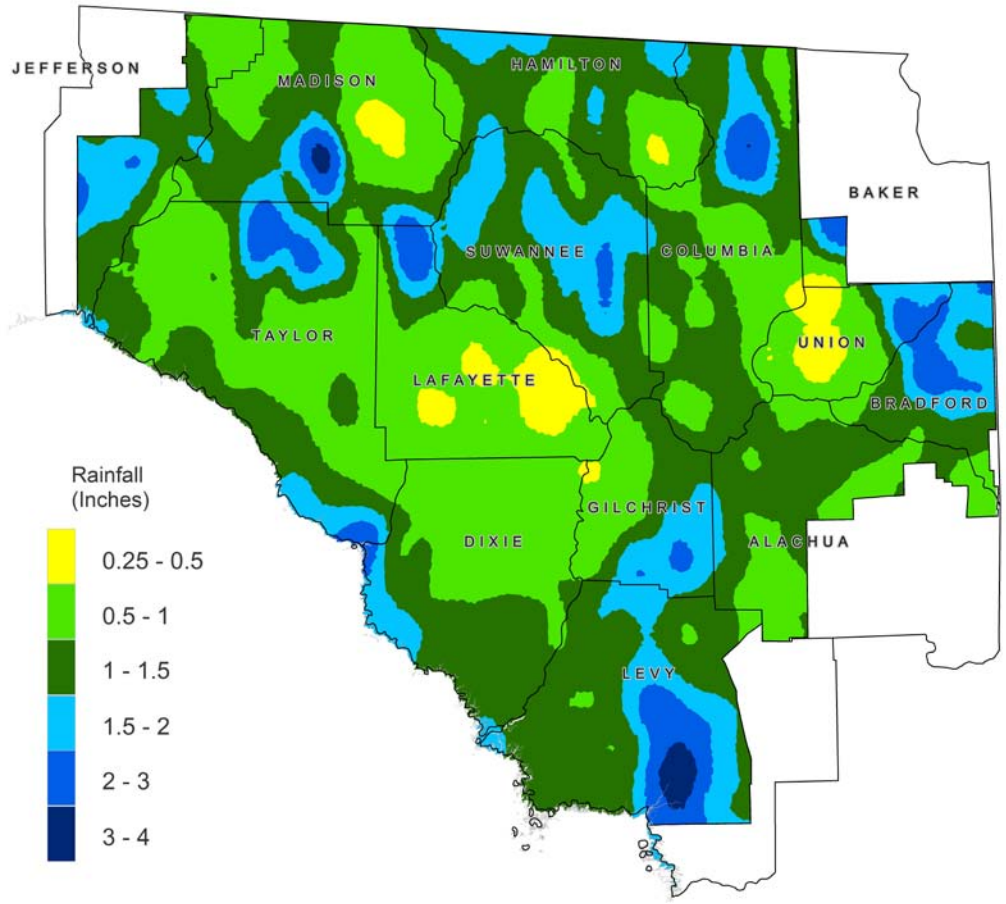


Figure 3: April 2012 Regional Percent of Normal Rainfall

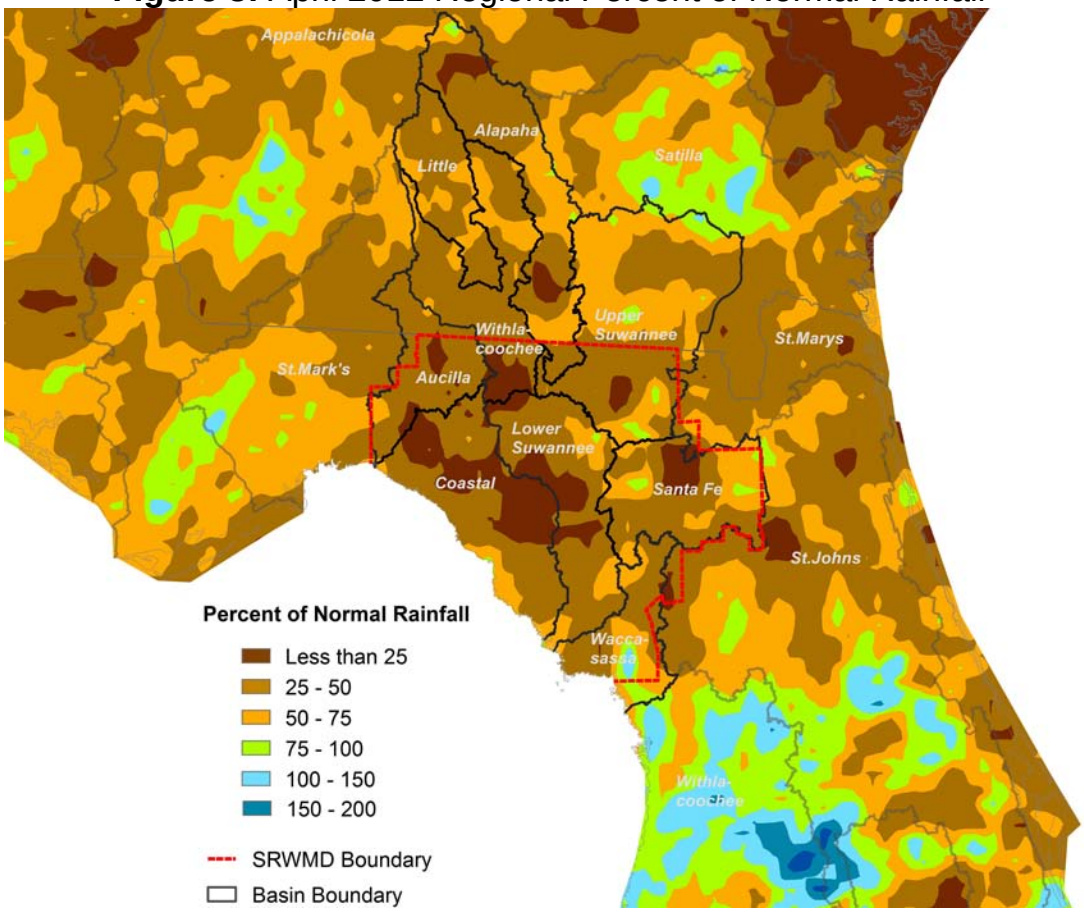


Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin
Ending April 30, 2012

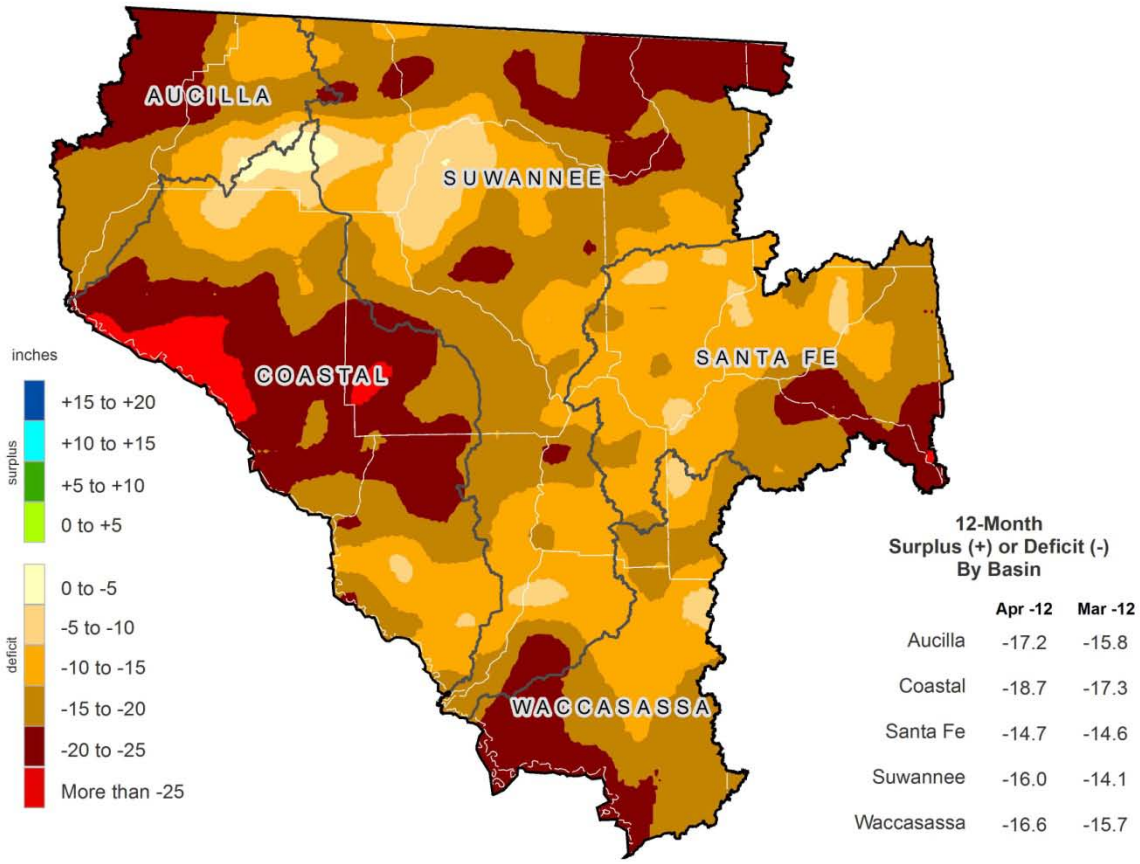


Figure 5: 12-Month Rolling Rainfall Deficit Since 1932
Difference between observed 12-month rainfall and the long-term average over the same period

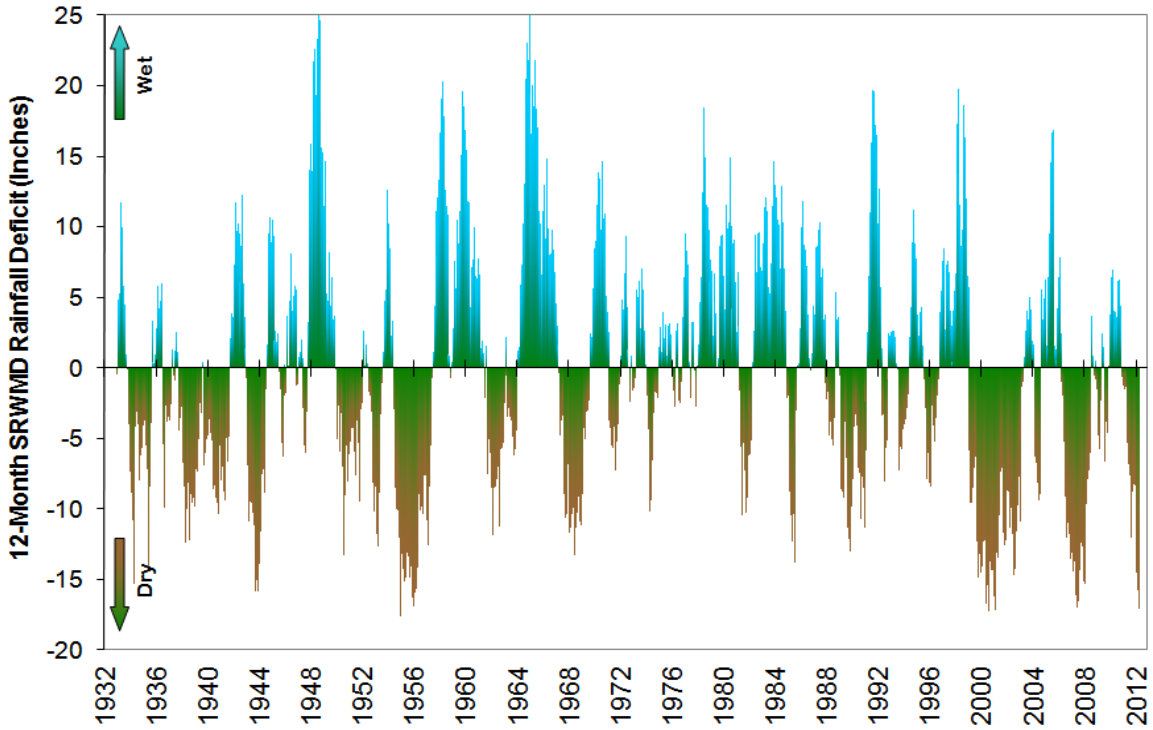
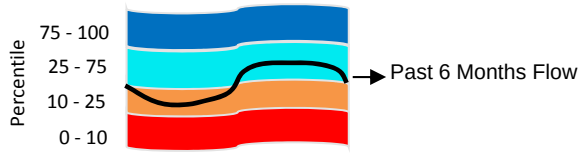
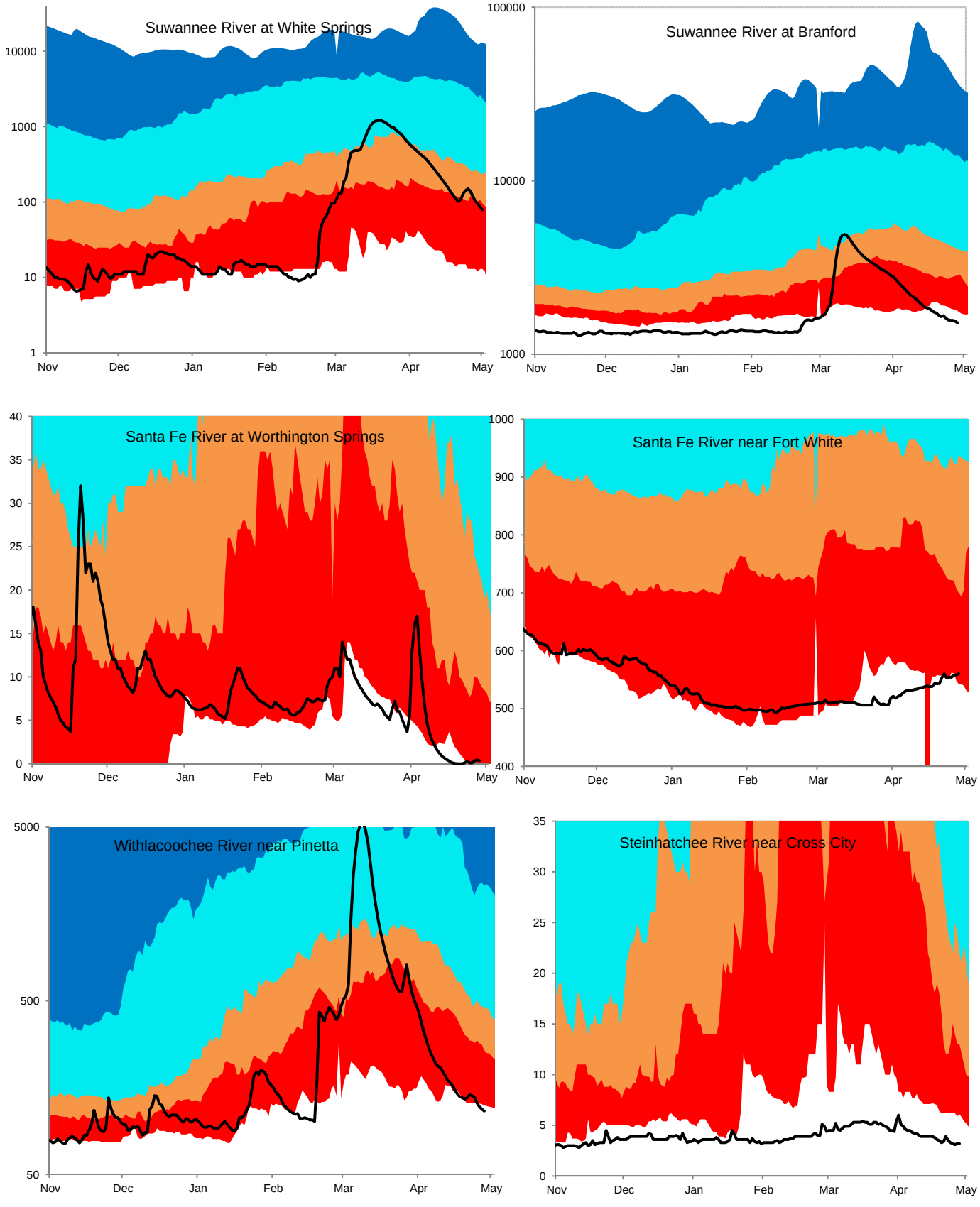


Figure 6: Daily River Flow Statistics

November 1, 2011 through April 30, 2012





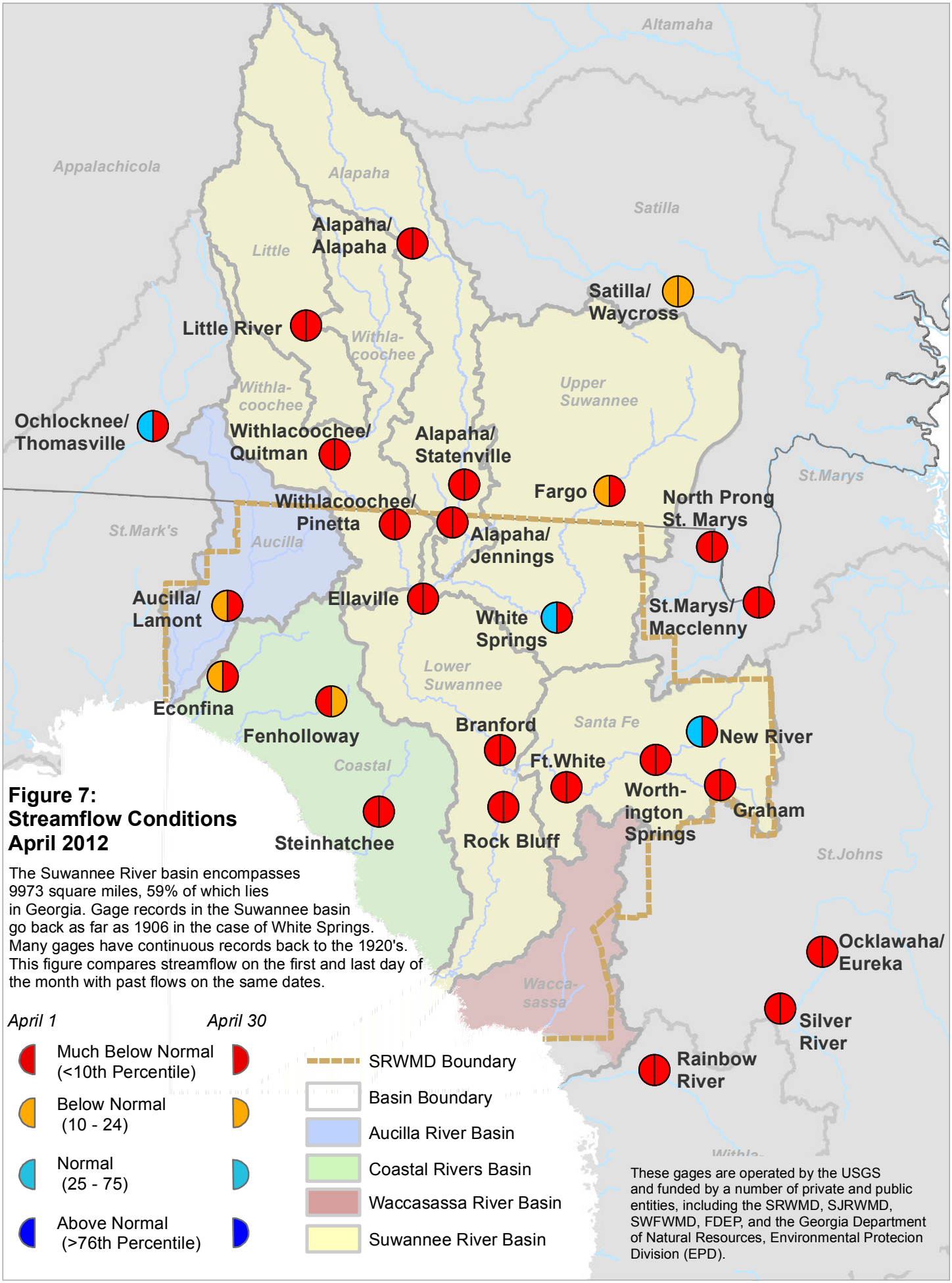
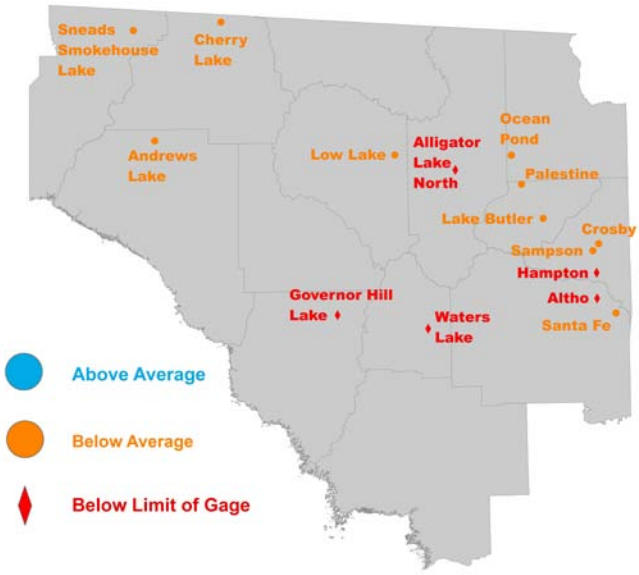
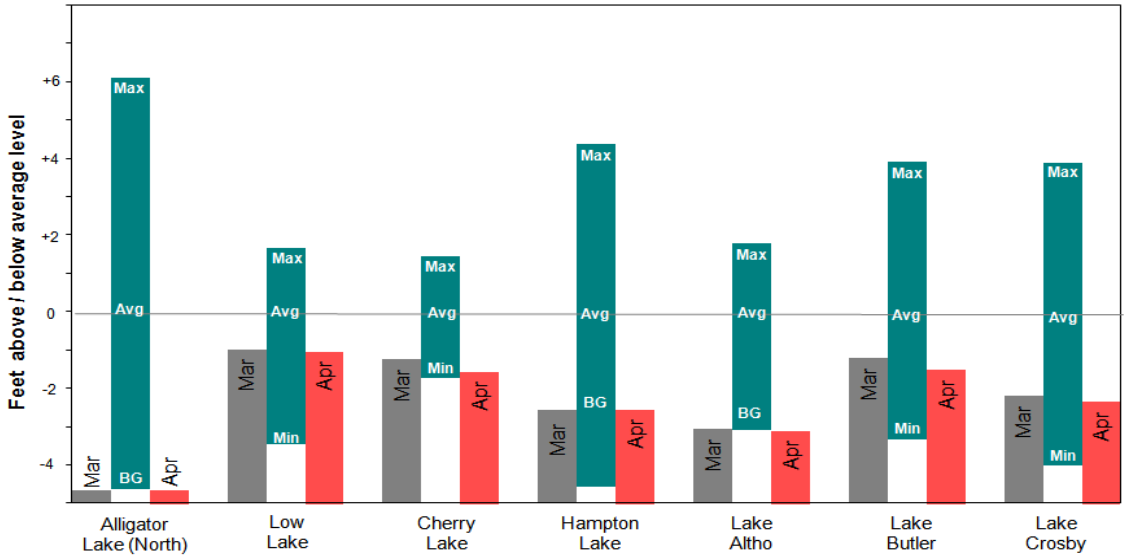

Altamaha
Appalachicola
Alapaha
Satilla
Little
Alapaha/
Alapaha
Satilla/
Waycross
Little River
Withla-
coochee
Withla-
coochee
Upper
Suwannee
Ochlocknee/
Thomasville
Withlacoochee/
Quitman
Alapaha/
Statenville
St.Marys
Fargo
North Prong
St. Marys
Withlacoochee/
Pinetta
St.Mark's
Aucilla
Alapaha/
Jennings
Aucilla/
Lamont
Ellaville
White
Springs
St.Marys/
Macclenny
Lower
Suwannee
Econfina
Fenholloway
Branford
Santa Fe
New River
Coastal
Ft.White
Worth-
ington
Springs
Graham
Steinhatchee
Rock Bluff
St.Johns
Ocklawaha/
Eureka
Wacca-
sassa
Silver
River
Rainbow
River
Figure 7:
Streamflow Conditions
April 2012
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.
April 1
April 30
Much Below Normal (<10th Percentile)
Below Normal (10 - 24)
Normal (25 - 75)
Above Normal (>76th Percentile)
SRWMD Boundary
Basin Boundary
Aucilla River Basin
Coastal Rivers Basin
Waccasassa River Basin
Suwannee River Basin
These gages are operated by the USGS and funded by a number of private and public entities, including the SRWMD, SJRWMD, SWFWMD, FDEP, and the Georgia Department of Natural Resources, Environmental Protecion Division (EPD).

Figure 8: April 2012 Lake Levels

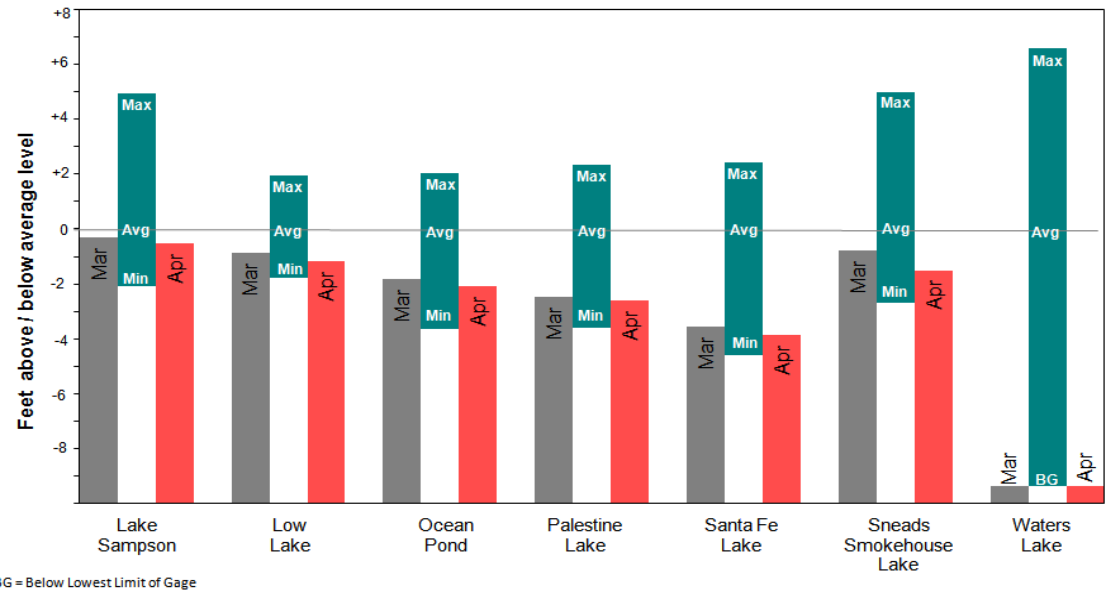


SRWMD lakes react differently to climatic changes depending on their location in the landscape. Some lakes, in particular ones in the eastern part of the District, are embedded in a surficial or intermediate aquifer over relatively impermeable clay deposits. These lakes rise and fall according to local 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 full. 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 1970's, although the Sampson Lake record starts in 1957.



BG = Below Lowest Limit of Gage



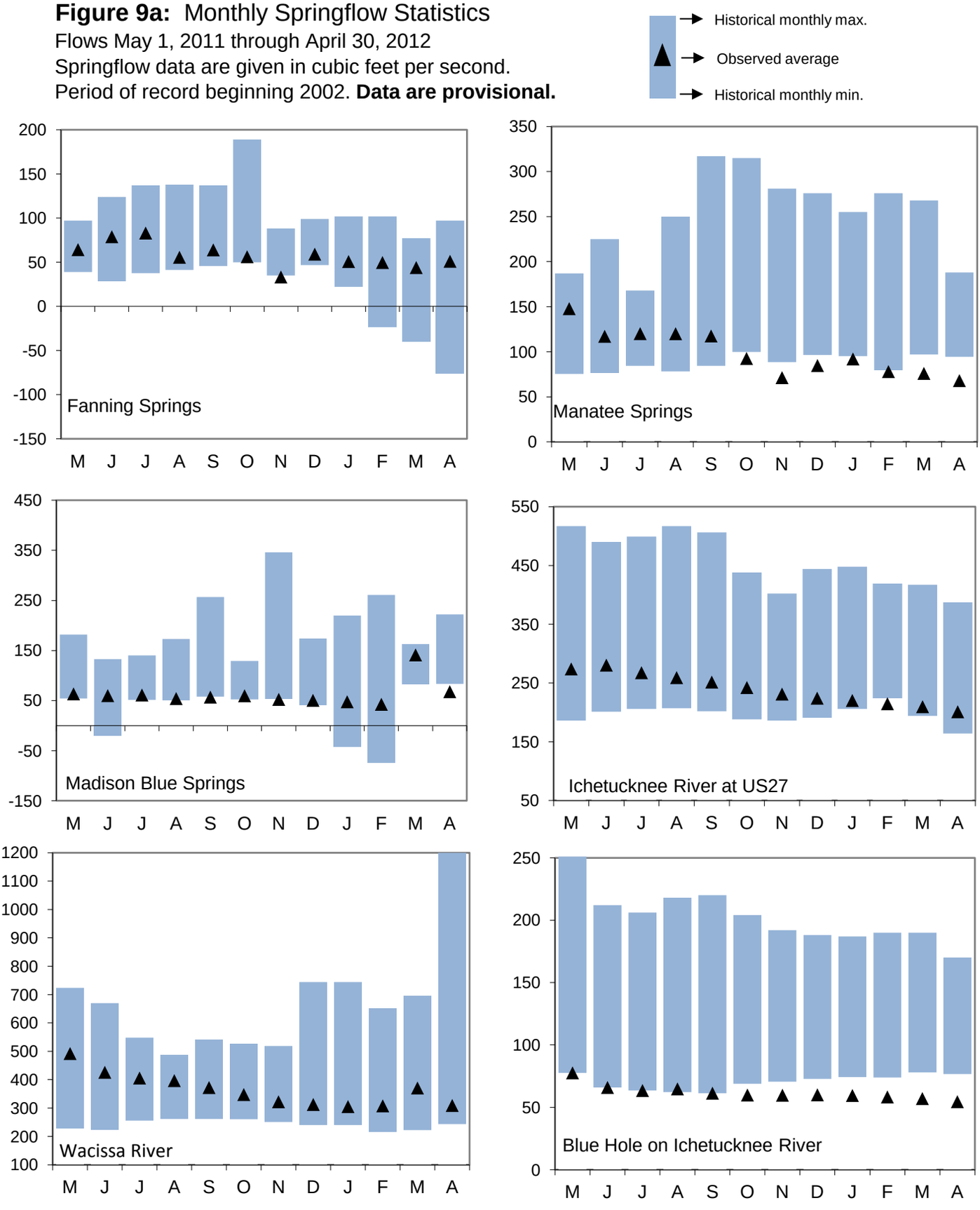
BG = Below Lowest Limit of Gage

Figure 9a: Monthly Springflow Statistics

Flows May 1, 2011 through April 30, 2012

Springflow data are given in cubic feet per second.

Period of record beginning 2002. **Data are provisional.**

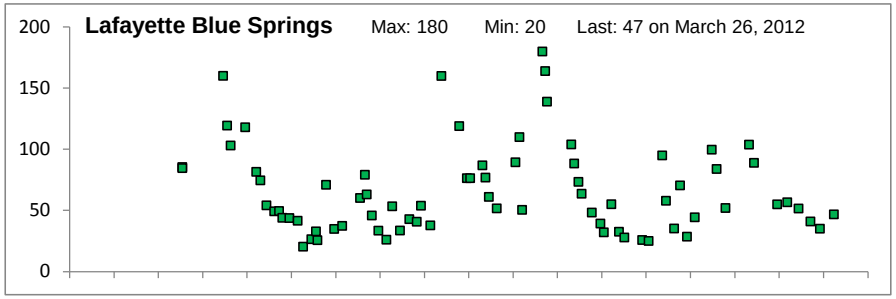


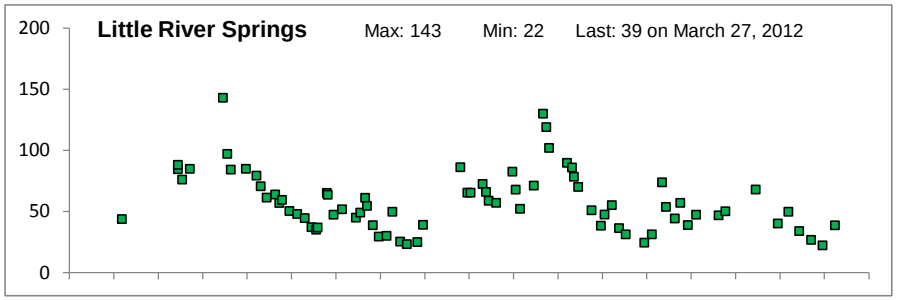
Note: Rising river levels caused by high tides or flooding can cause springflow to slow or reverse.
Springflow for months marked by an asterisk (*) was strongly affected by river conditions.
Data will be revised once approved and published by the U.S. Geological Survey.

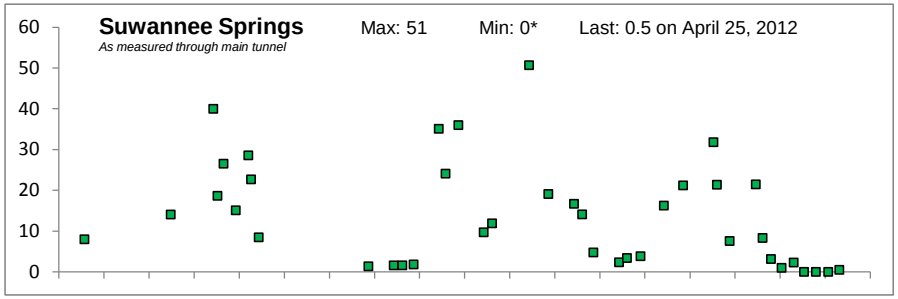
Figure 9b: Quarterly Springflow Measurements
These springs are measured at least once per quarter.
Springflow data are given in cubic feet per second.

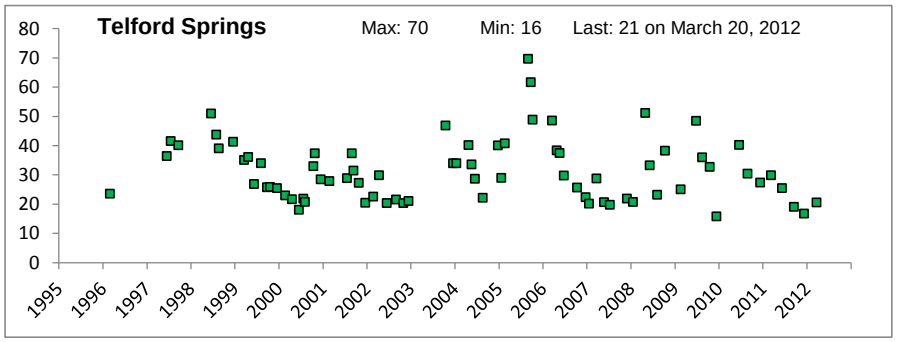
Spring flow is greatly affected by river levels. Rising river levels can slow spring flow or even reverse it. Some low flows in this data may not be representative of drought conditions.

Springs on Suwannee River

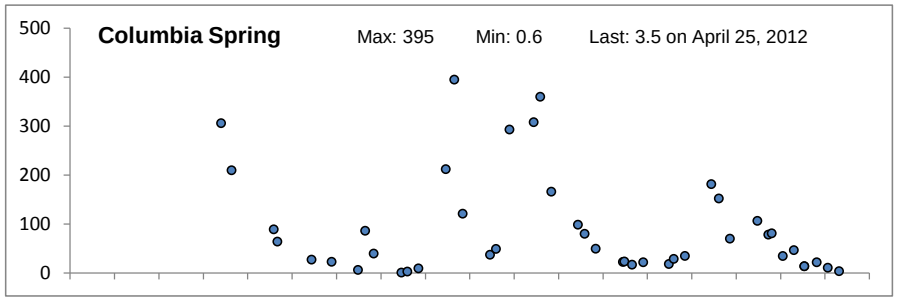


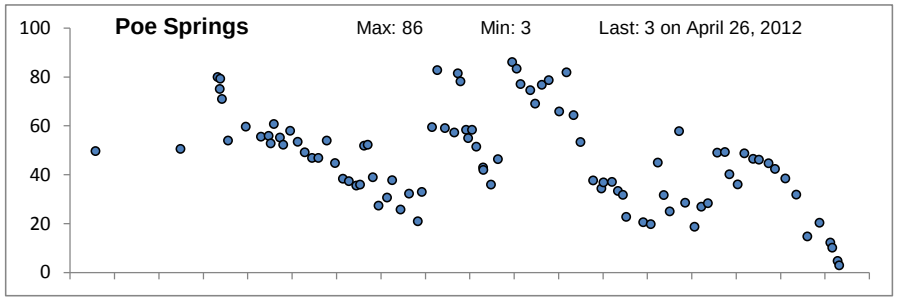


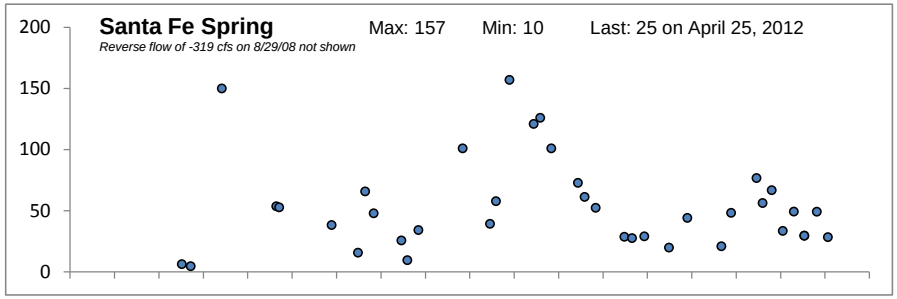


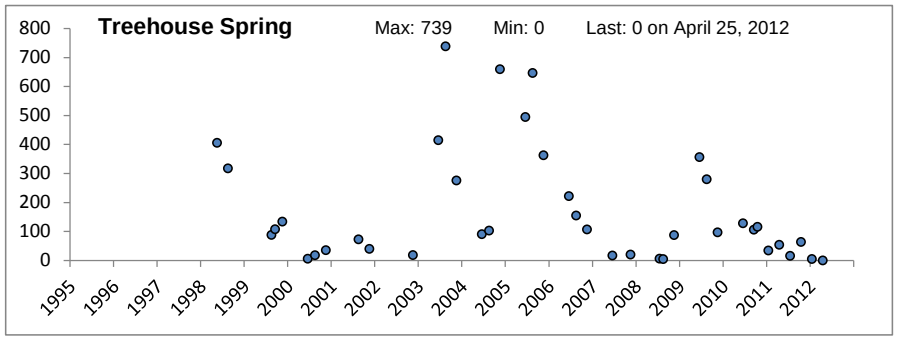


Springs on Santa Fe River









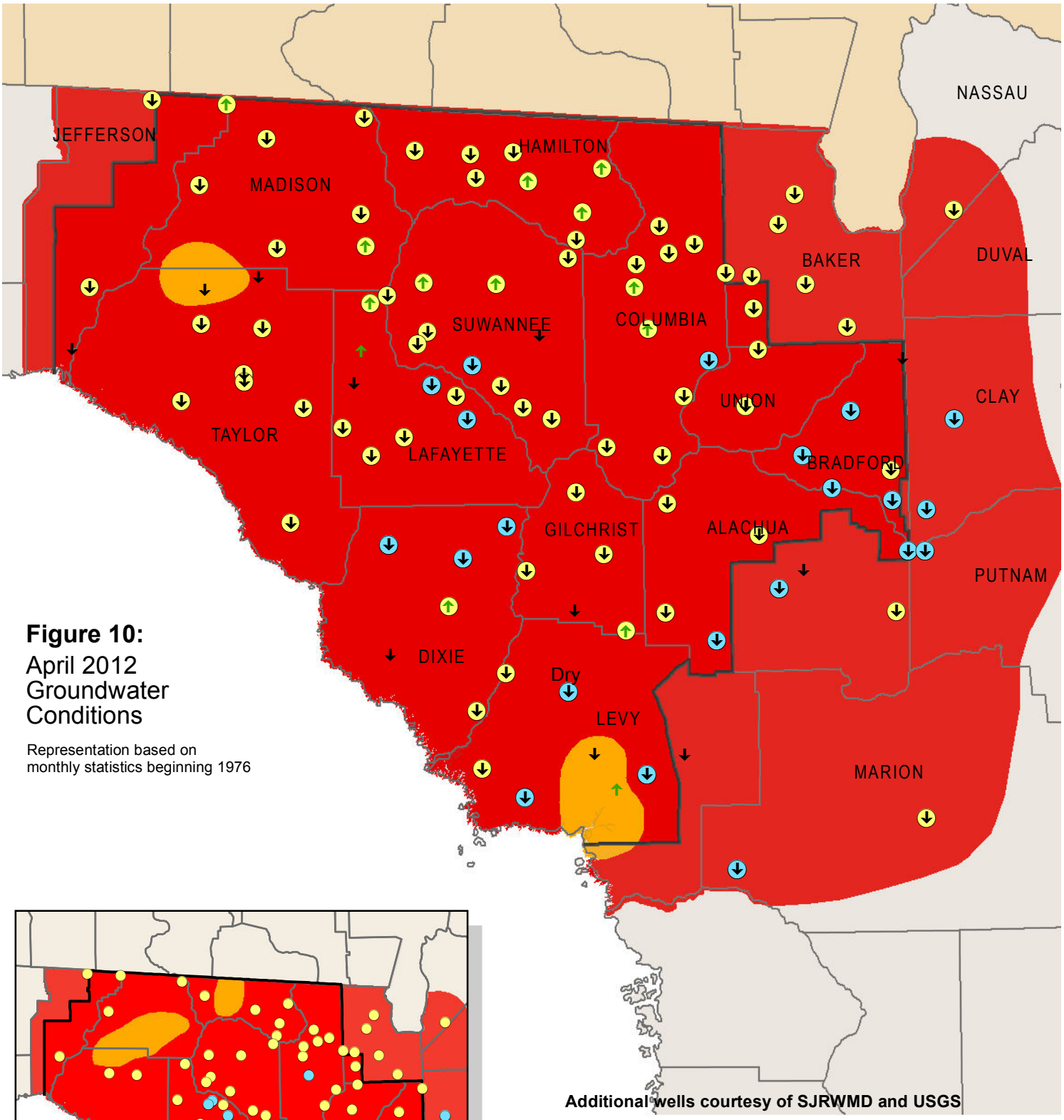
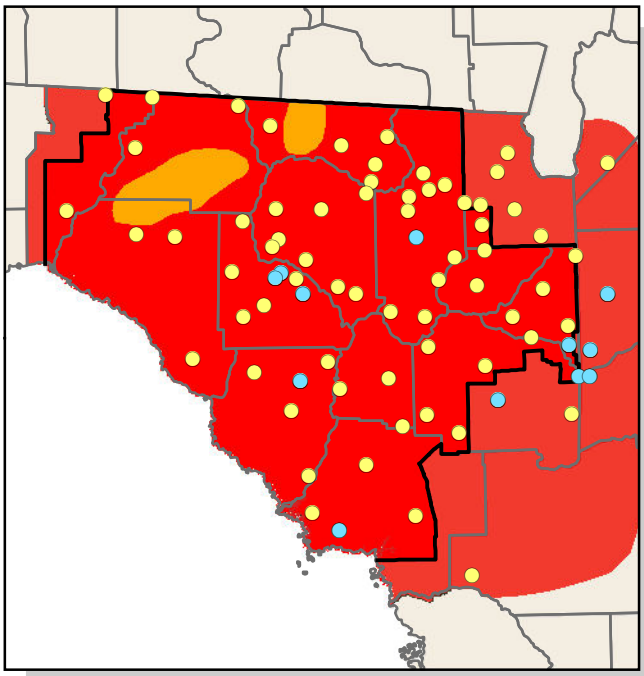


Figure 10:
April 2012
Groundwater
Conditions

Representation based on
monthly statistics beginning 1976



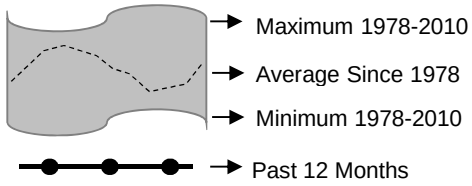
Inset: March 2012 Groundwater Levels

Additional wells courtesy of SJRWMD and USGS

- 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
- District Boundary
- Record Low for Month
- Historic Low

Figure 11: Monthly Groundwater Level Statistics

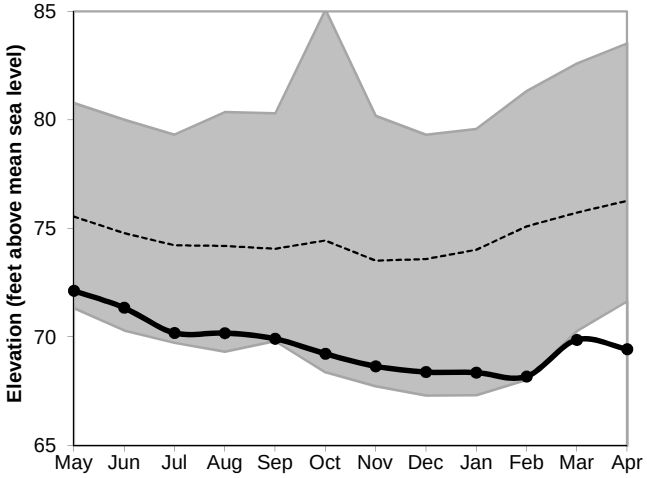
Levels May 1, 2011 through April 30, 2012
Period of Record Beginning 1978



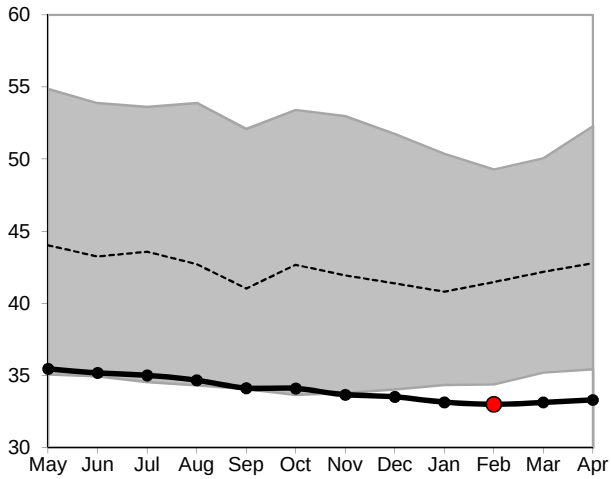
Historic Low

Past 12 Months

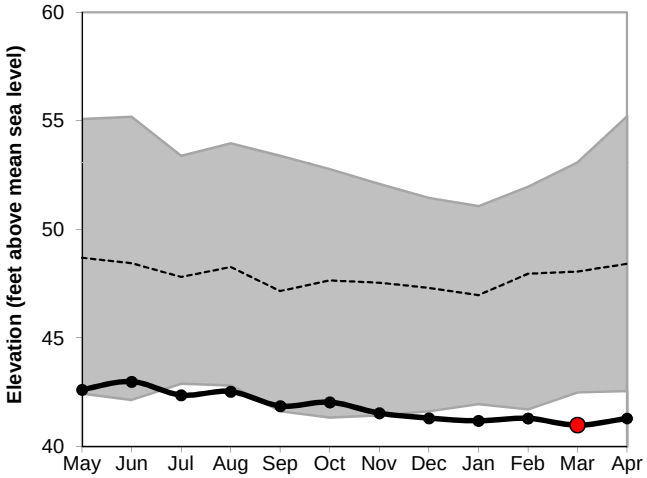
Madison County N010719001
near Greenville



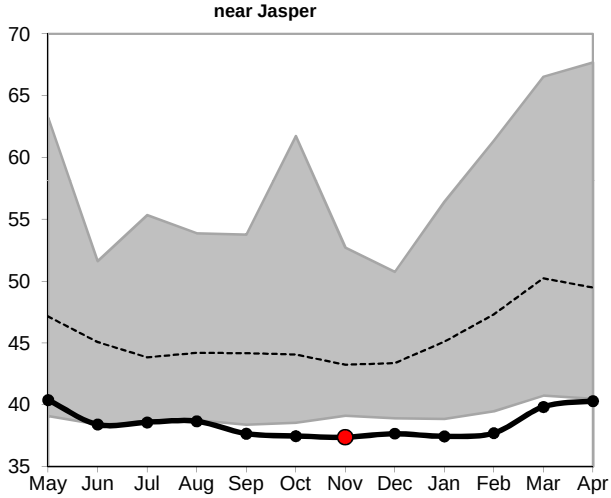
Suwannee County S021335001
near Live Oak



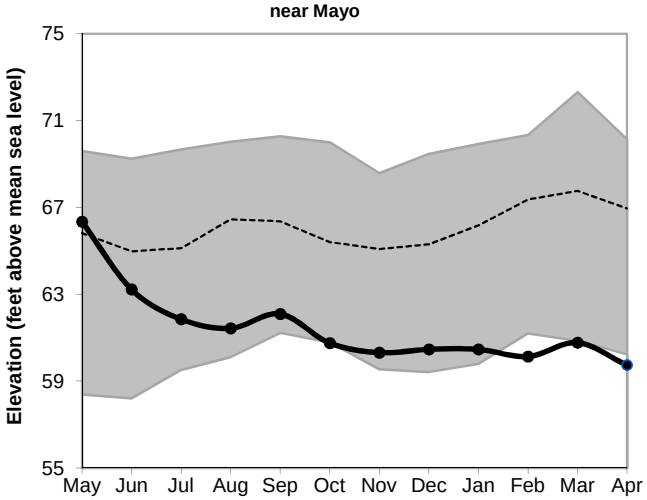
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S050701001
near Perry

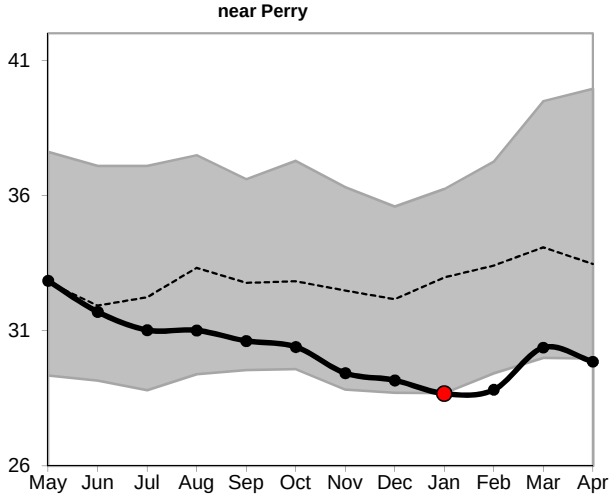
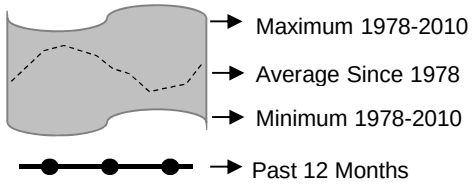
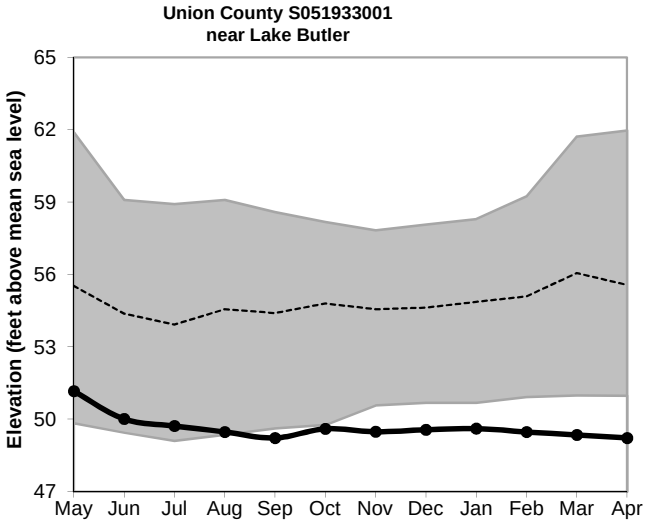
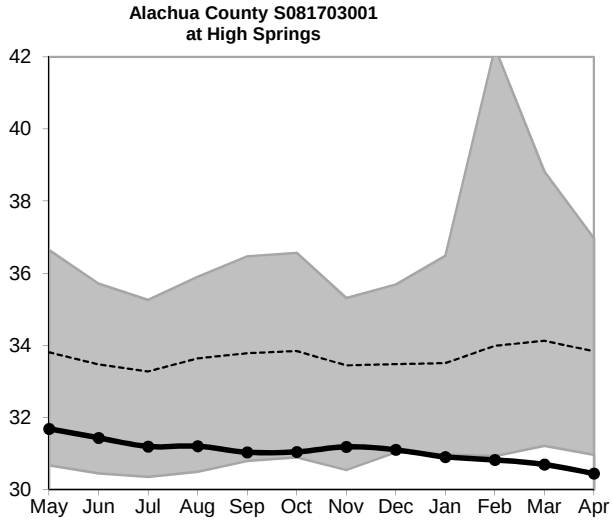


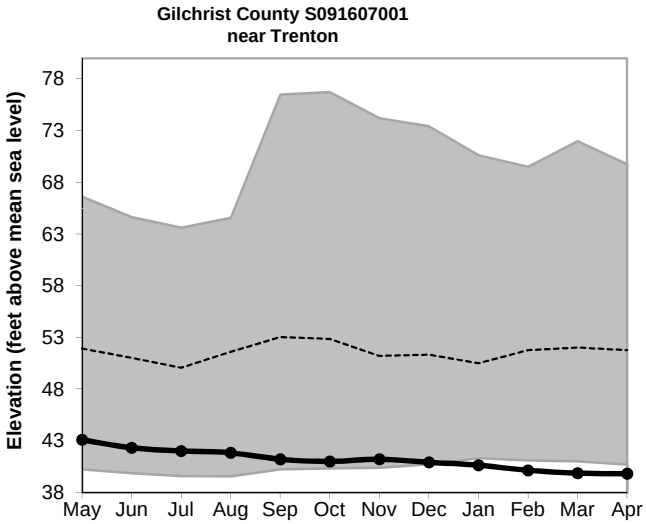
Figure 11, cont.: Groundwater Level Statistics

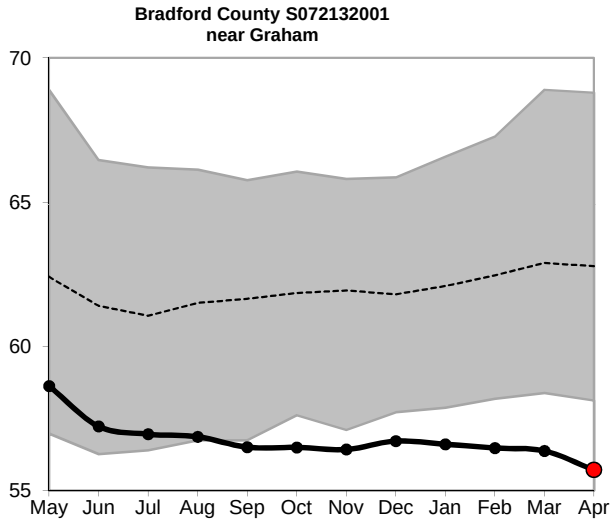
Levels May 1, 2011 through April 30, 2012
Period of Record Beginning 1978

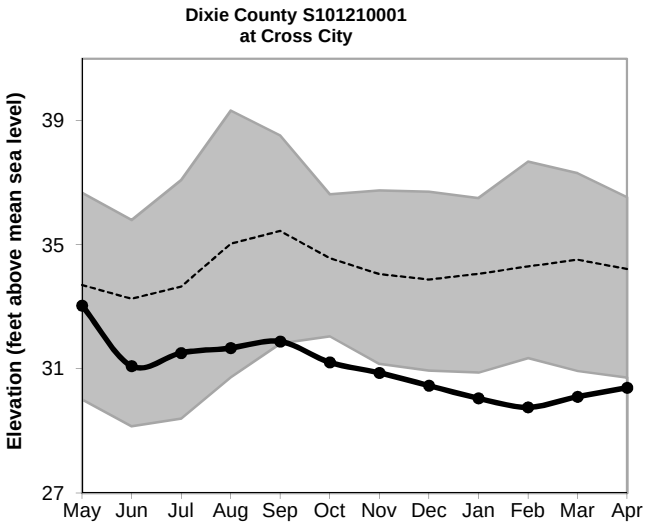


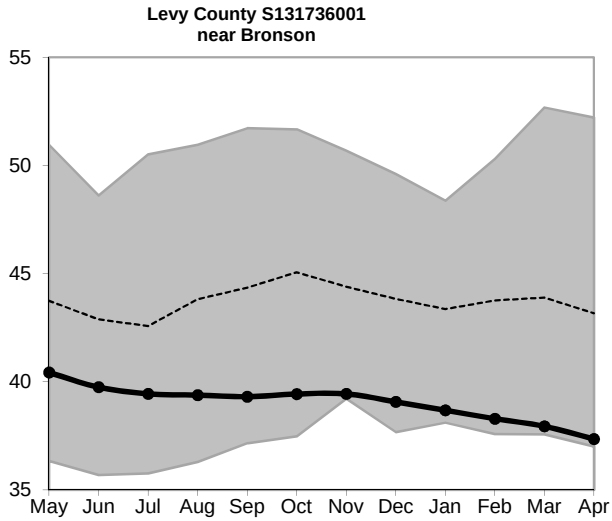












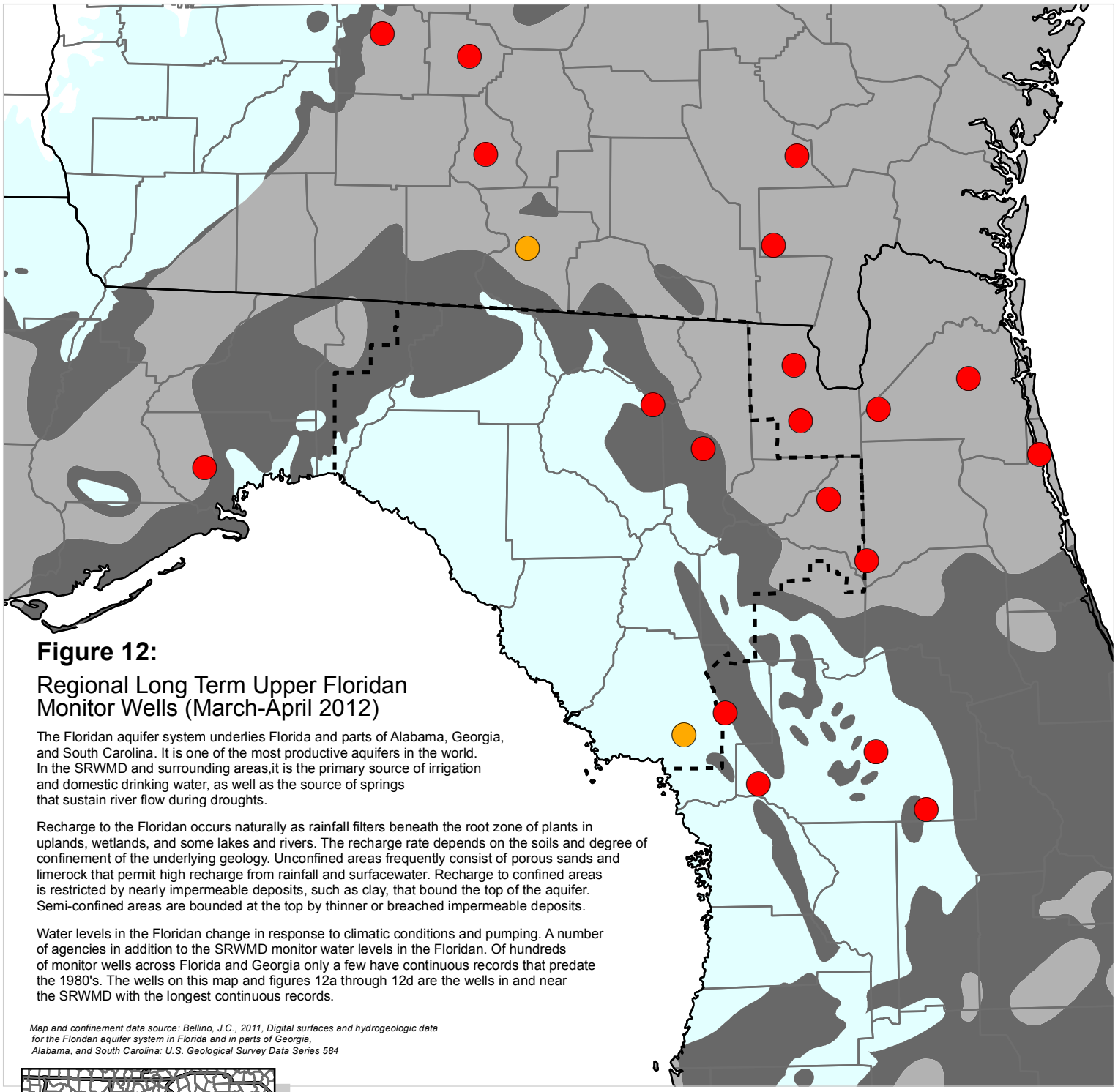


Figure 12:

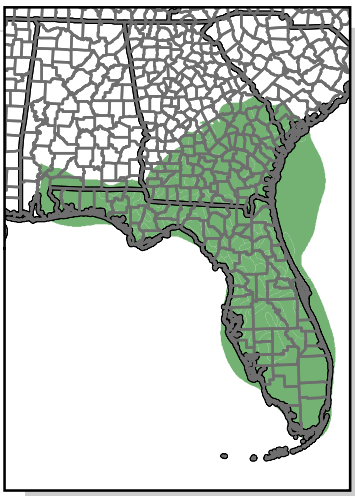
Regional Long Term Upper Floridan Monitor Wells (March-April 2012)

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 figures 12a through 12d 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

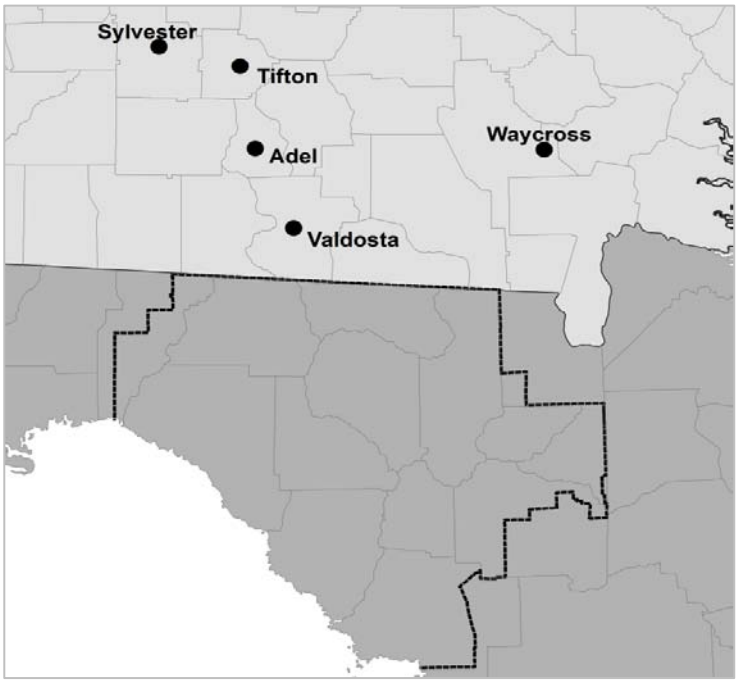
- Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
- Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
- Unconfined: Upper confining unit is absent or very thin. Recharge is high.

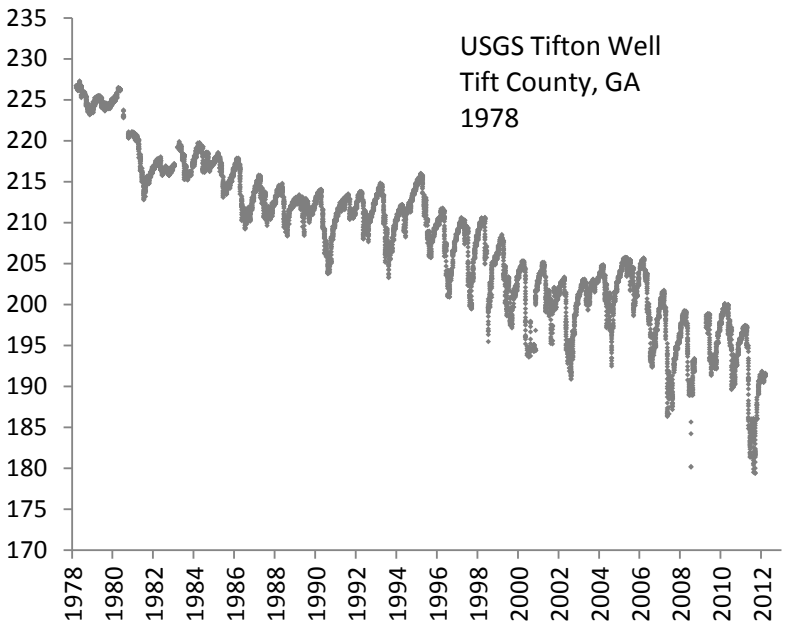
Percentile of Most Recent Water Level Relative to Entire Record

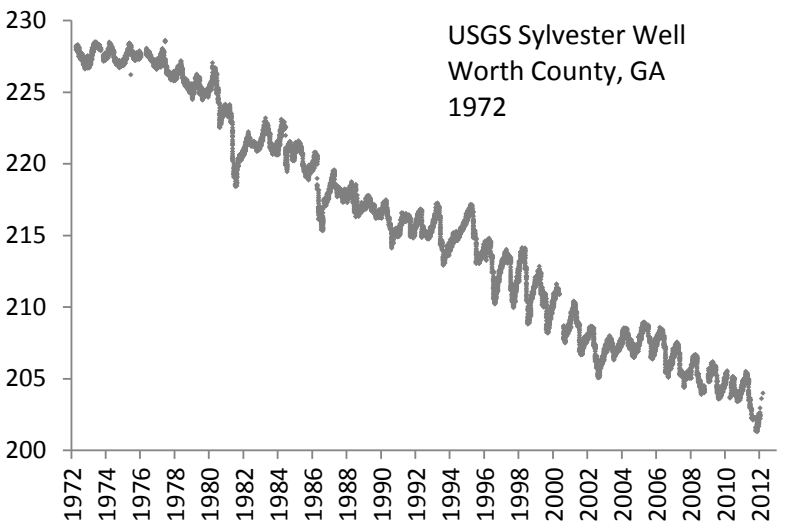
- High (Greater than 75th Percentile)
- Normal (25th to 75th Percentile)
- Low (10th to 25th Percentile)
- Extremely Low (Less than 10th Percentile)
- Not Available
- SRWMD Boundary

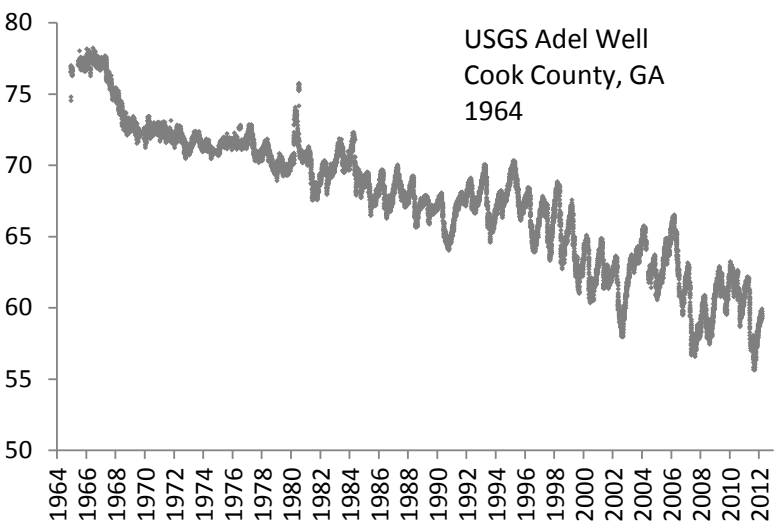
Figure 12a: Regional Long Term Upper Floridan Levels

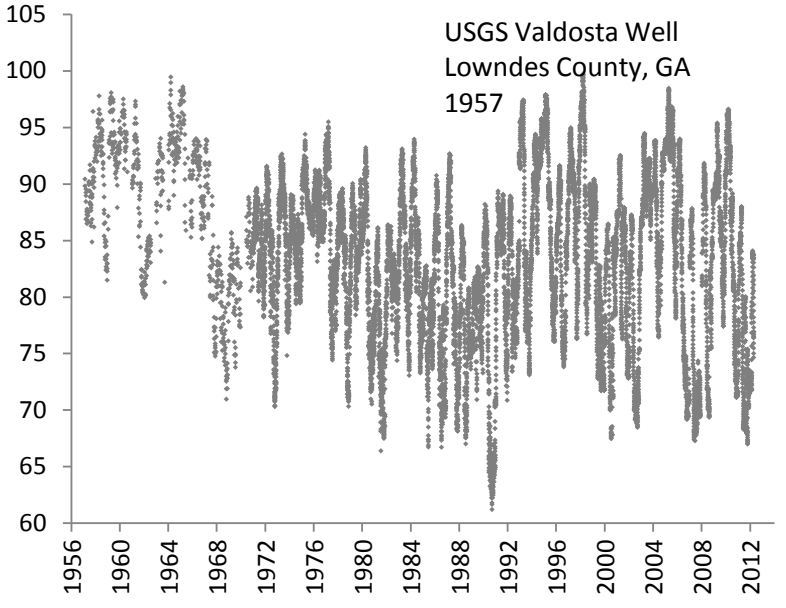
Ending March-April 2012
Upper Floridan Aquifer levels in feet above mean sea level
Courtesy of USGS and Georgia EPD











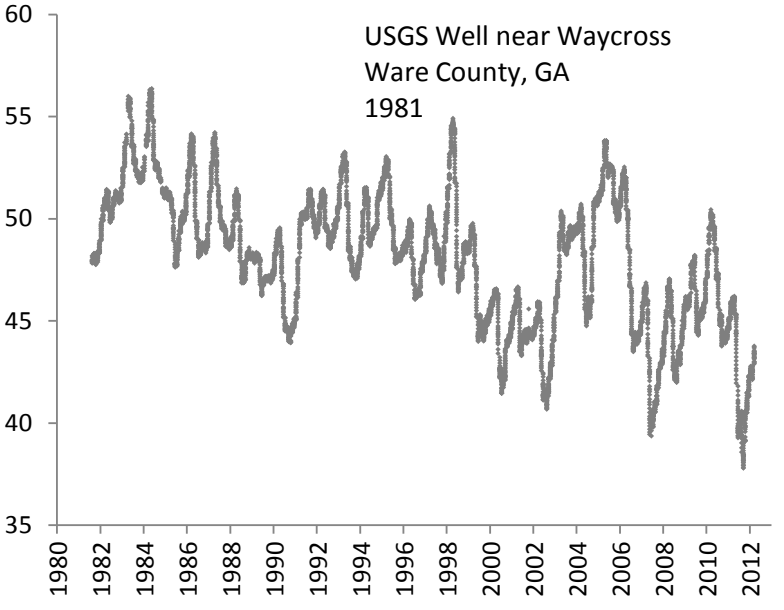
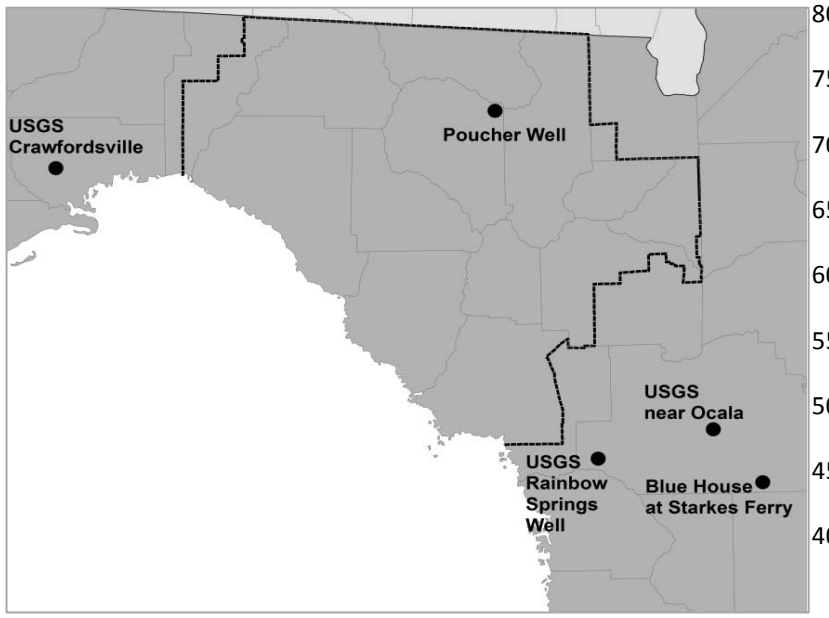
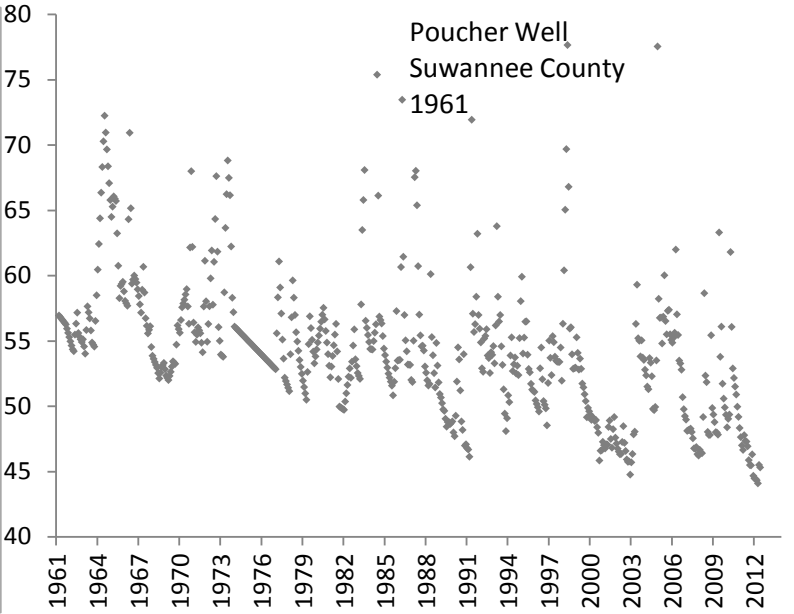
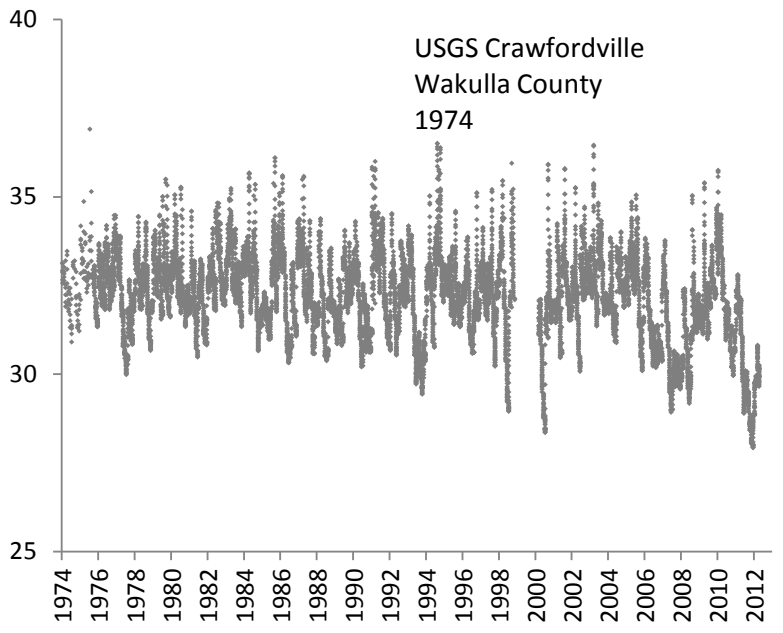


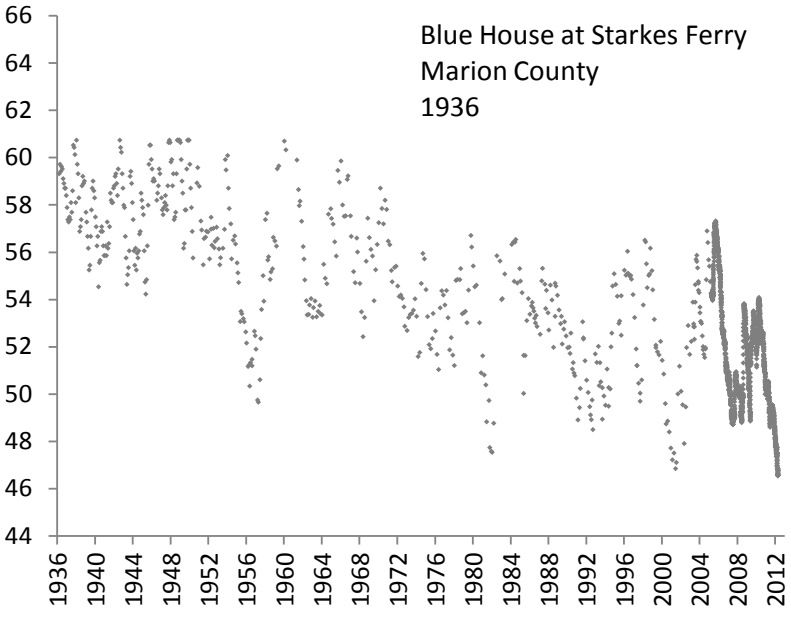
Figure 12b: Regional Long Term Upper Floridan Levels

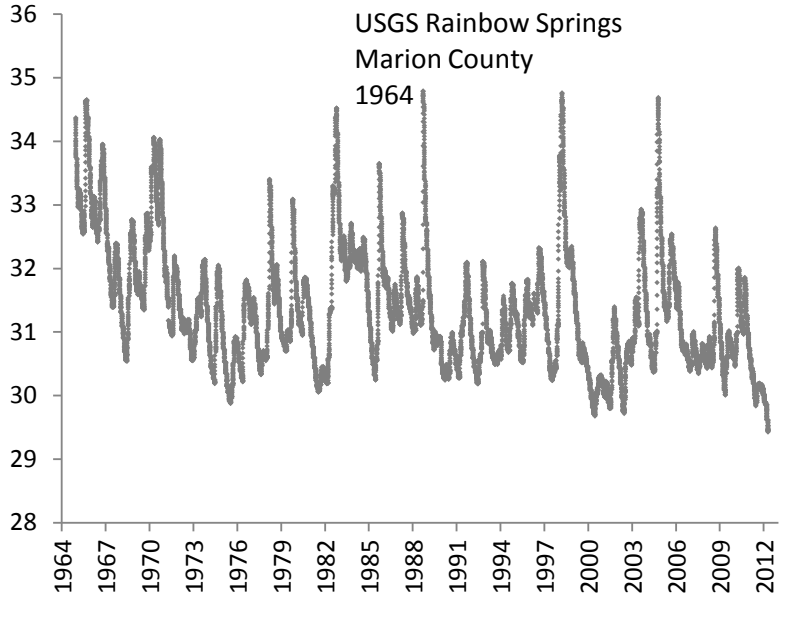
Ending April 30, 2012
Upper Floridan Aquifer levels in feet above mean sea level
Courtesy of USGS, SWFWMD, and SJRWMD











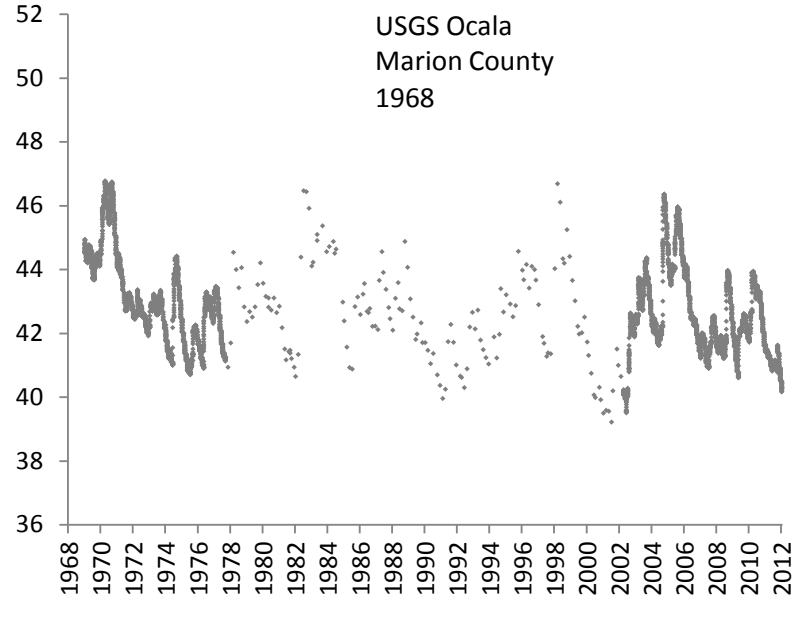
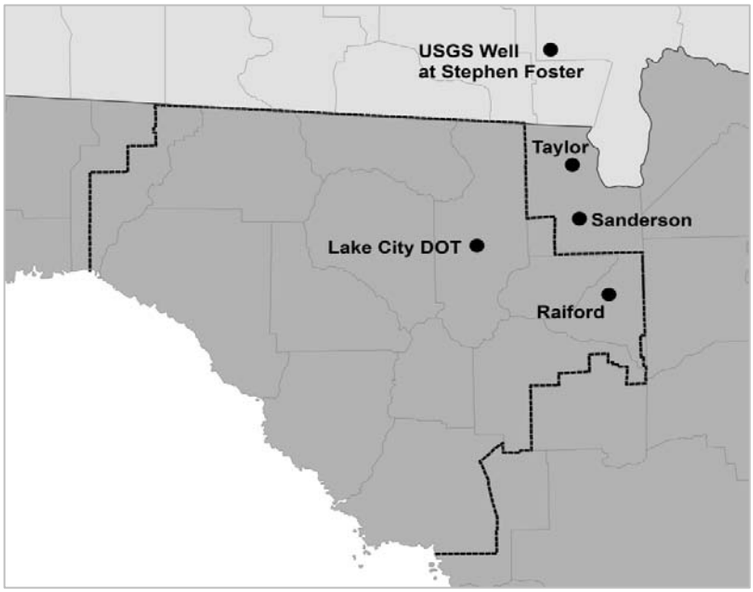
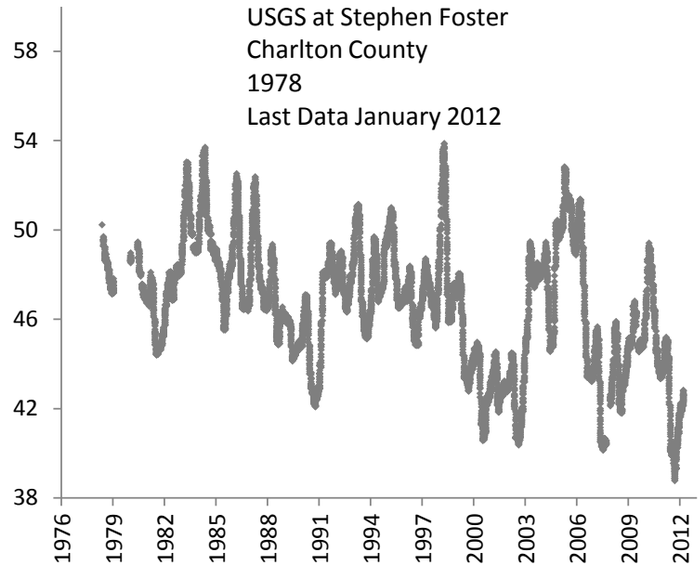
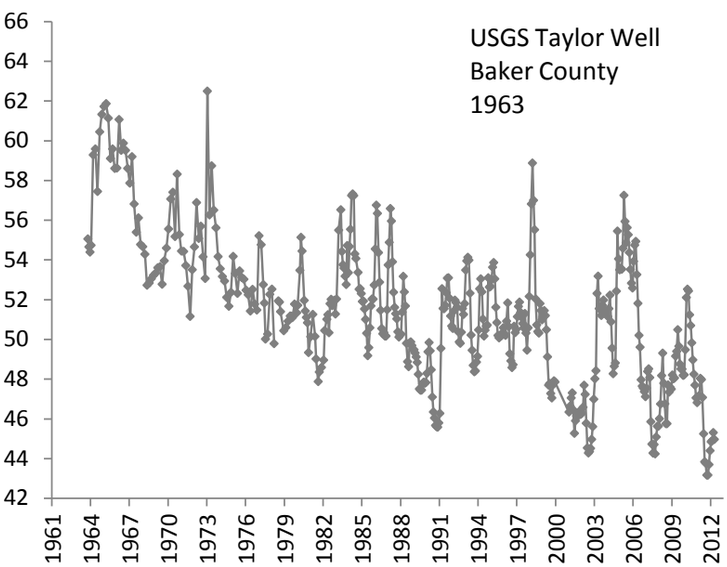


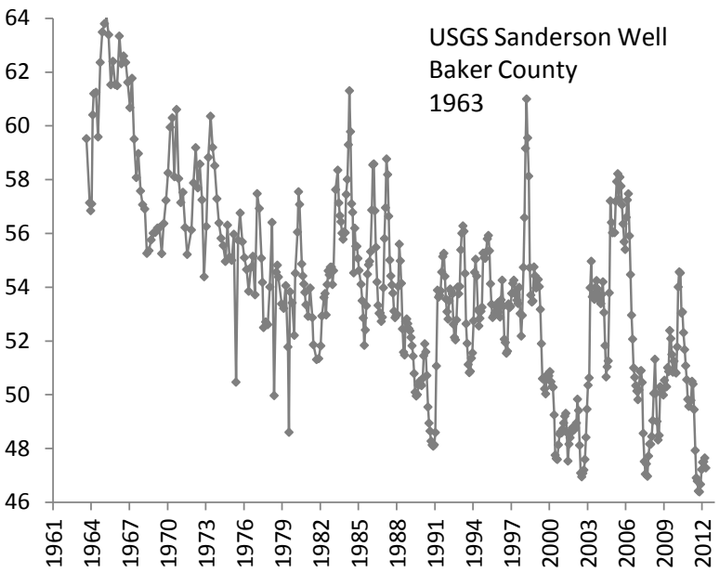
Figure 12c: Regional Long Term Upper Floridan Levels

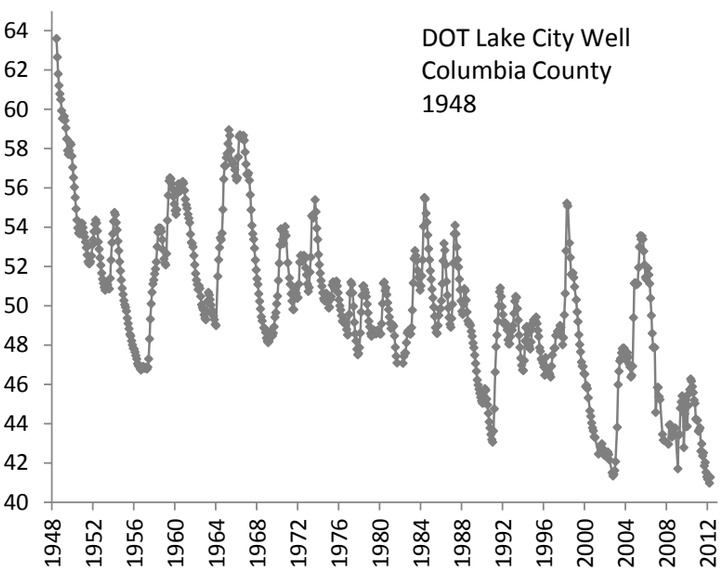
Ending March 2012-April 2012
Upper Floridan Aquifer levels in feet above mean sea level
Courtesy of USGS and SJRWMD











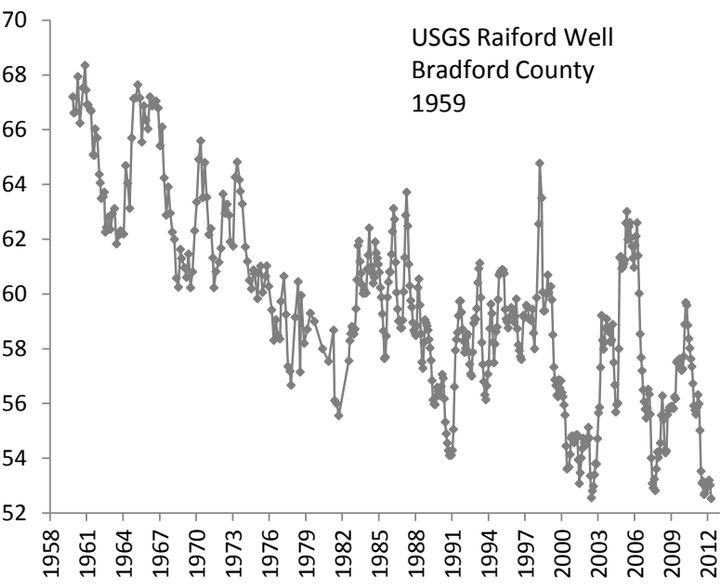


Figure 12d: Regional Long Term Upper Floridan Levels

Ending April 2012
Upper Floridan Aquifer levels in feet above mean sea level
Courtesy of SJRWMD