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: February 6, 2014

RE: January 2014 Hydrologic Conditions Report for the District

RAINFALL

- District-wide January rainfall was 5.43", almost 50% higher than the average of 3.66" based on records beginning in 1932 (Table 1, Figure 1). Most of the District received at least 4" with parts of Taylor, Dixie, Lafayette, Suwannee, and Columbia counties seeing 7-8" (Figure 2).
- The lowest gaged total for the month was 4.02" at the District's station in Clyattville, Georgia. The highest gaged total was 8.46" at the Tom Gunter gage in Mallory Swamp (southeast Lafayette County). This gage also had the highest daily total of 2.78".
- The Alapaha and Withlacoochee basins in south Georgia received less than normal rainfall, with a deficit of 1-2" for the second month in a row. The Okefenokee Swamp (the headwaters of the upper Suwannee River) received at least an inch above normal (Figure 3).
- Average rainfall for the 12 months ending January 31 was 5.4" higher than the long-term average of 54.63" (Figure 4). Persistent deficits in the upper Suwannee, Santa Fe, and Aucilla basins were reduced slightly by the month's rainfall, but still remained near 10". Average rainfall for the 3 months ending January 31 was 3" higher than the long-term average of 9.2", an improvement of 4" since December (Figure 5).

SURFACEWATER

- **Rivers:** The Suwannee River at White Springs rose 5' by mid-month, then fell by 2'. Gages on the entire Suwannee remained above median, but still in a range considered typical for the time of year. Gages on tributary rivers in south Georgia also remained in a normal range. Conditions improved at the Santa Fe River near Fort White, which rose to its long-term median January level after dropping below the 25th percentile in October. The Econfina and Fenholloway rivers rose above the 75th percentile early in the month. Statistics for a number of rivers are presented graphically in Figure 6, and conditions relative to historic conditions are in Figure 7.

- **Lakes**: Levels rose at all of the District's monitored lakes. Only Crosby Lake, Sampson Lake, and Sneads Smokehouse Lake remained lower than their long-term mean levels. Sneads Smokehouse Lake, in the upper Aucilla basin in Jefferson County, rose 4' in four days early in the month. The lake had fallen to record lows in December after the Florida Fish and Wildlife Conservation Commission completed a hydrologic restoration project by removing a dam that had separated the lake from a sinkhole since the 1960s. Sneads ended the month only 4" lower than average, with the highest level since September. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for a number of monitored lakes.

- **Springs**: The rising Suwannee River began flowing into White Sulphur Springs on January 4 after six weeks of no flow in or out. The spring had flowed out for eight weeks in September and October. The flow rate into the spring on January 30 was 22 MGD (million

gallons per day). The flow at Poe Springs on the 28th was 34 MGD, near its long-term median flow of 30 MGD. Statistics for these springs and others are shown in Figure 9. Troy Springs State Park was closed to swimming and diving after the rising river inundated the spring pool.

GROUNDWATER

After falling steadily since August, upper Floridan aquifer levels rose at 75% of the District's monitor wells. Levels continued to fall in the middle Suwannee River corridor in Lafayette County, where even above-average rainfall could not sustain the exceptionally high groundwater levels caused by nearly 40" of rain that fell in the summer. Overall, conditions improved from near the 50th percentile in December to the 70th percentile by the end of January, based on records beginning in the 1970s. Only 8 wells had levels lower than their 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 February 1 indicated normal conditions in north Florida and southeast Georgia.
- The National Weather Service Climate Prediction Center (CPC) three-month outlook showed a potential for below-normal precipitation through April. Neutral El Niño/Southern Oscillation conditions are expected through the spring, with no tendency toward either El Niño (cooler and wetter) or La Niña (warmer and drier) conditions caused by Pacific Ocean temperatures. Longer-range model results suggest the possibility of a mild El Niño developing in the summer.
- The U.S. Drought Monitor showed no drought conditions in north Florida or south Georgia, an improvement since December when abnormally dry conditions existed in the upper Suwannee basin.

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 (inches)

County	Jan 2014	January Average	Month % of Normal	Last 12 Months	Annual % of Normal
Alachua	5.12	3.39	151%	55.24	108%
Baker	6.27	3.48	180%	54.27	109%
Bradford	5.34	2.90	184%	52.18	103%
Columbia	6.10	3.43	178%	56.43	110%
Dixie	5.62	3.54	159%	60.65	103%
Gilchrist	4.72	4.58	103%	58.09	101%
Hamilton	5.27	4.31	122%	56.70	109%
Jefferson	4.06	4.35	93%	58.28	96%
Lafayette	5.87	4.09	144%	65.18	115%
Levy	4.73	3.99	119%	63.19	106%
Madison	5.12	3.93	130%	63.17	112%
Suwannee	5.80	4.20	138%	63.34	120%
Taylor	6.12	4.10	149%	67.29	113%
Union	5.68	4.00	142%	53.38	99%

January 2014 Average:	5.43
January Average (1932-2013):	3.66
Historical 12-month Average (1932-2013):	54.63
Past 12-Month Total:	60.07
12-Month Rainfall Surplus:	5.44

Figure 1: Comparison of District Monthly Rainfall

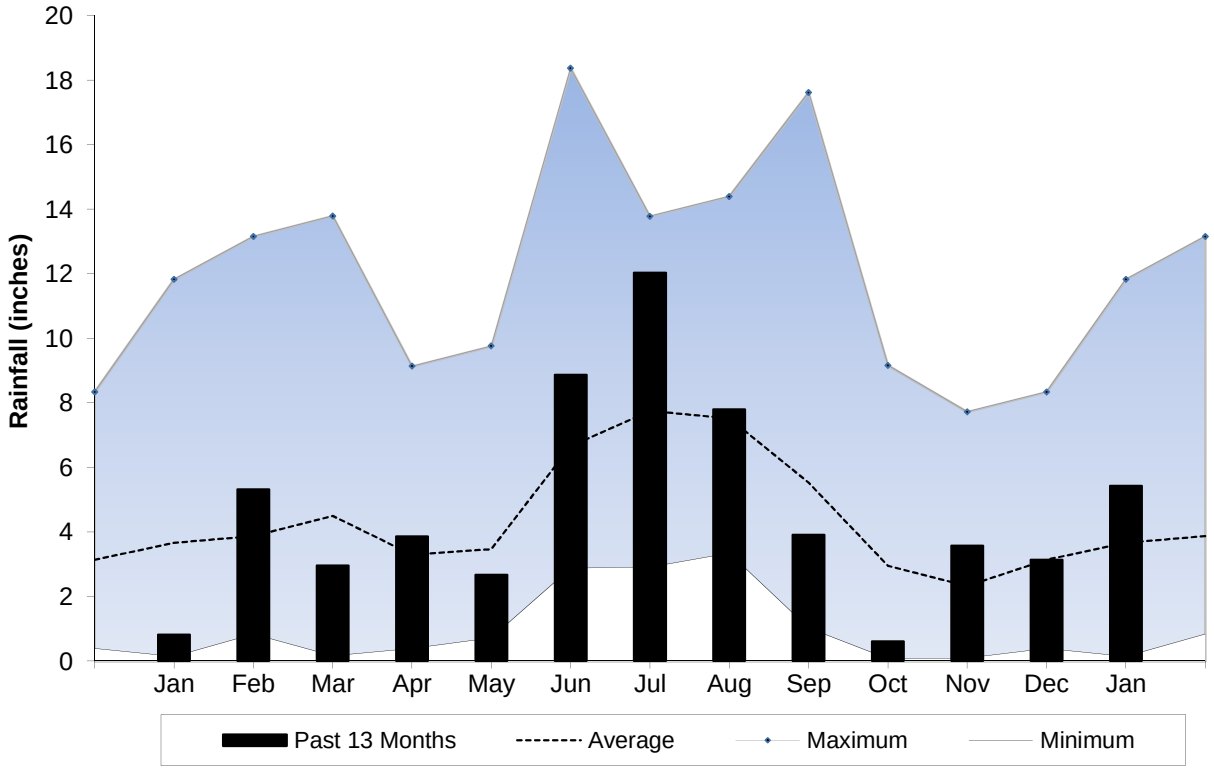


Figure 2: January 2014 Rainfall Estimate

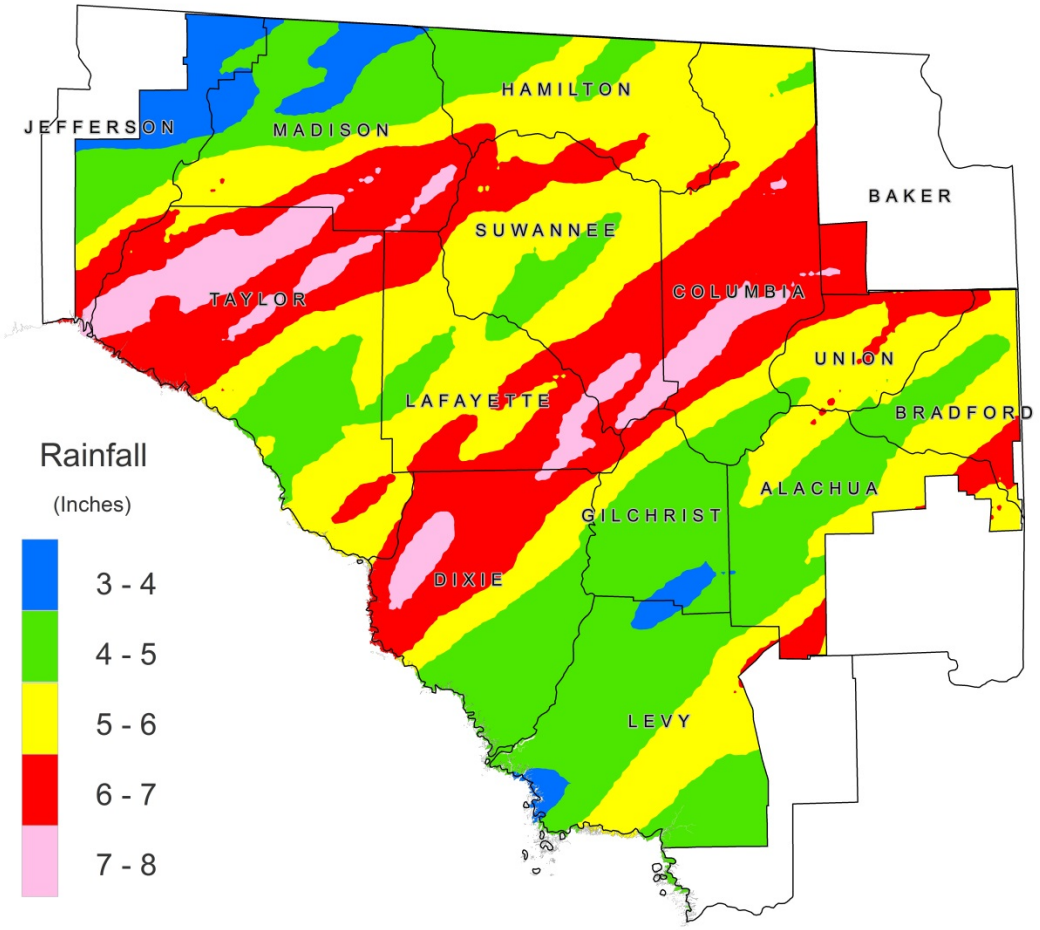


Figure 3: January 2014 Percent of Normal Rainfall

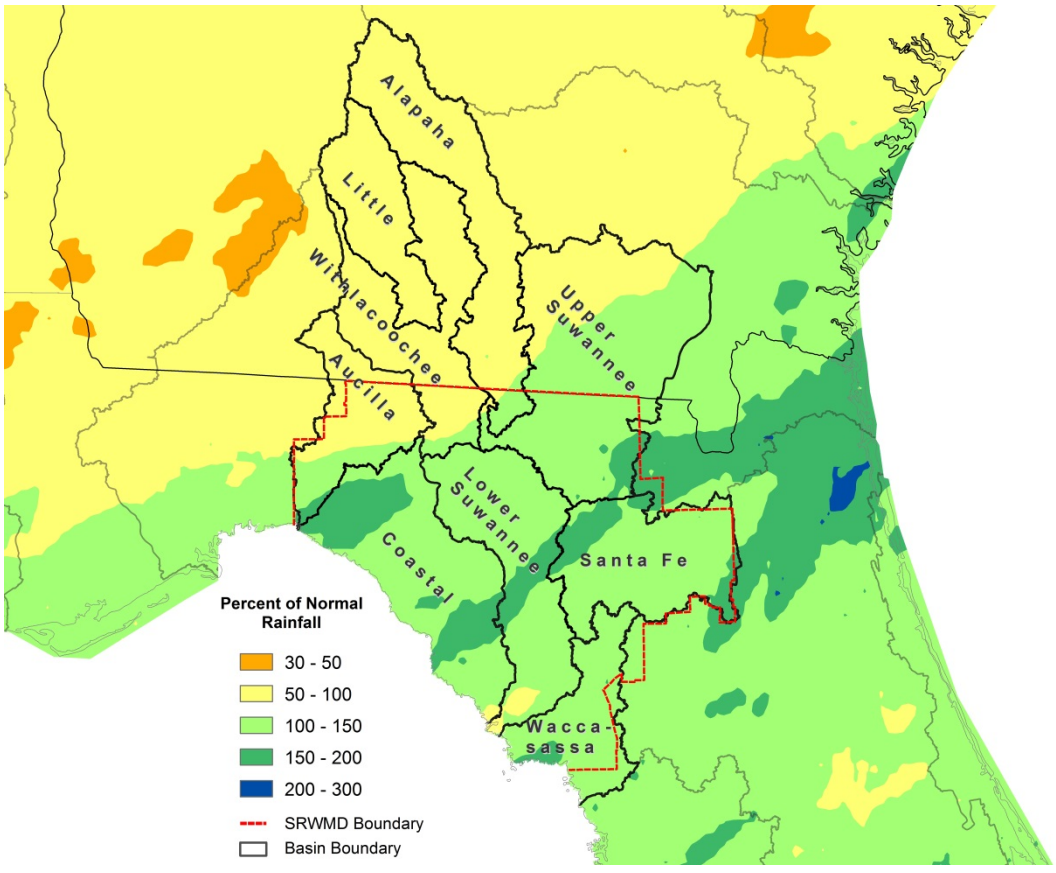
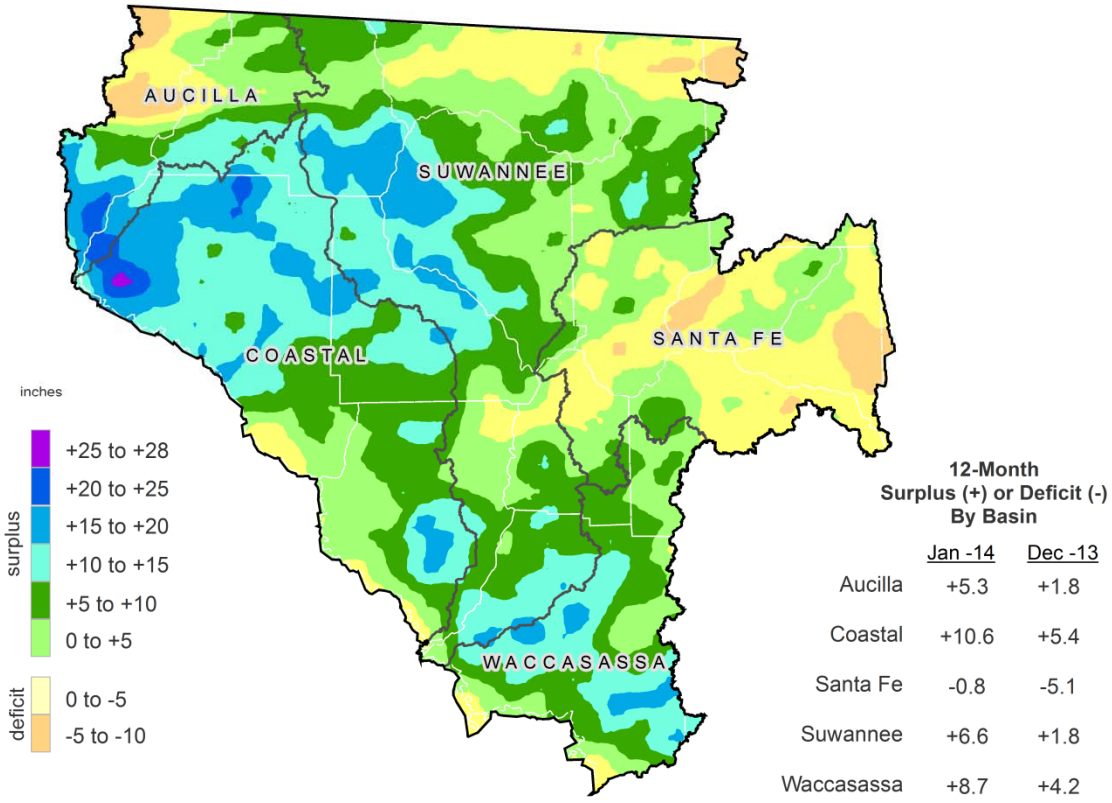


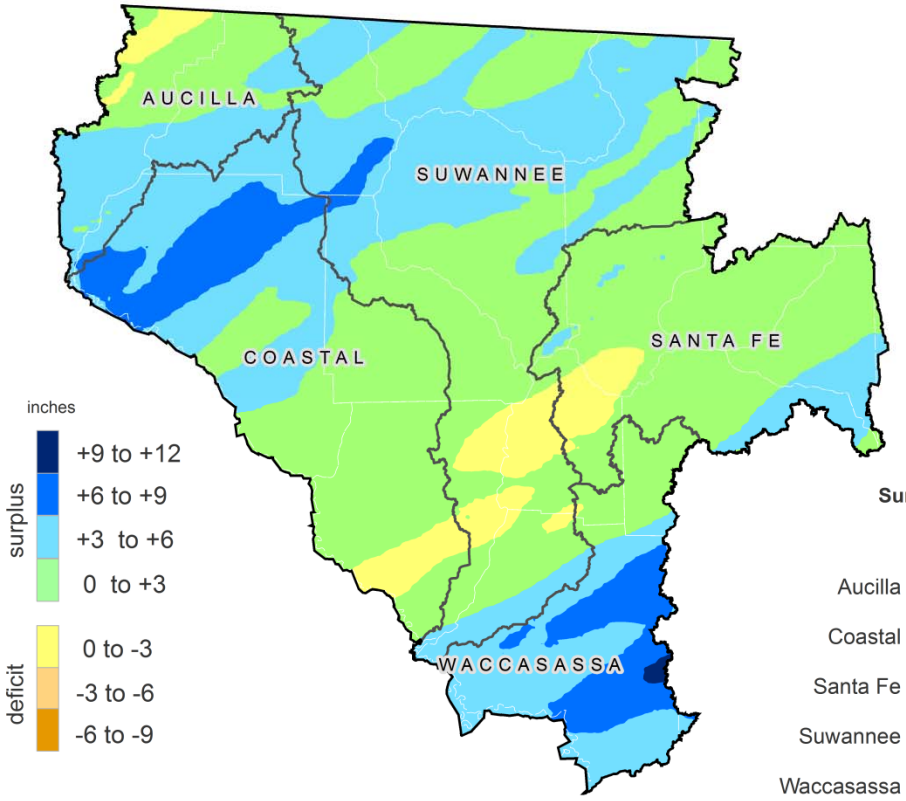
Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin
Through January 31, 2014



12-Month Surplus (+) or Deficit (-) By Basin

	Jan -14	Dec -13
Aucilla	+5.3	+1.8
Coastal	+10.6	+5.4
Santa Fe	-0.8	-5.1
Suwannee	+6.6	+1.8
Waccasassa	+8.7	+4.2

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



3-Month Surplus (+) or Deficit (-) By Basin

	Jan -14	Dec -13
Aucilla	+2.4	-0.6
Coastal	+3.3	-1.3
Santa Fe	+1.8	-2.7
Suwannee	+2.8	-1.5
Waccasassa	+5.0	+1.8

Figure 6: Daily River Flow Statistics
February 1, 2013 through January 31, 2014

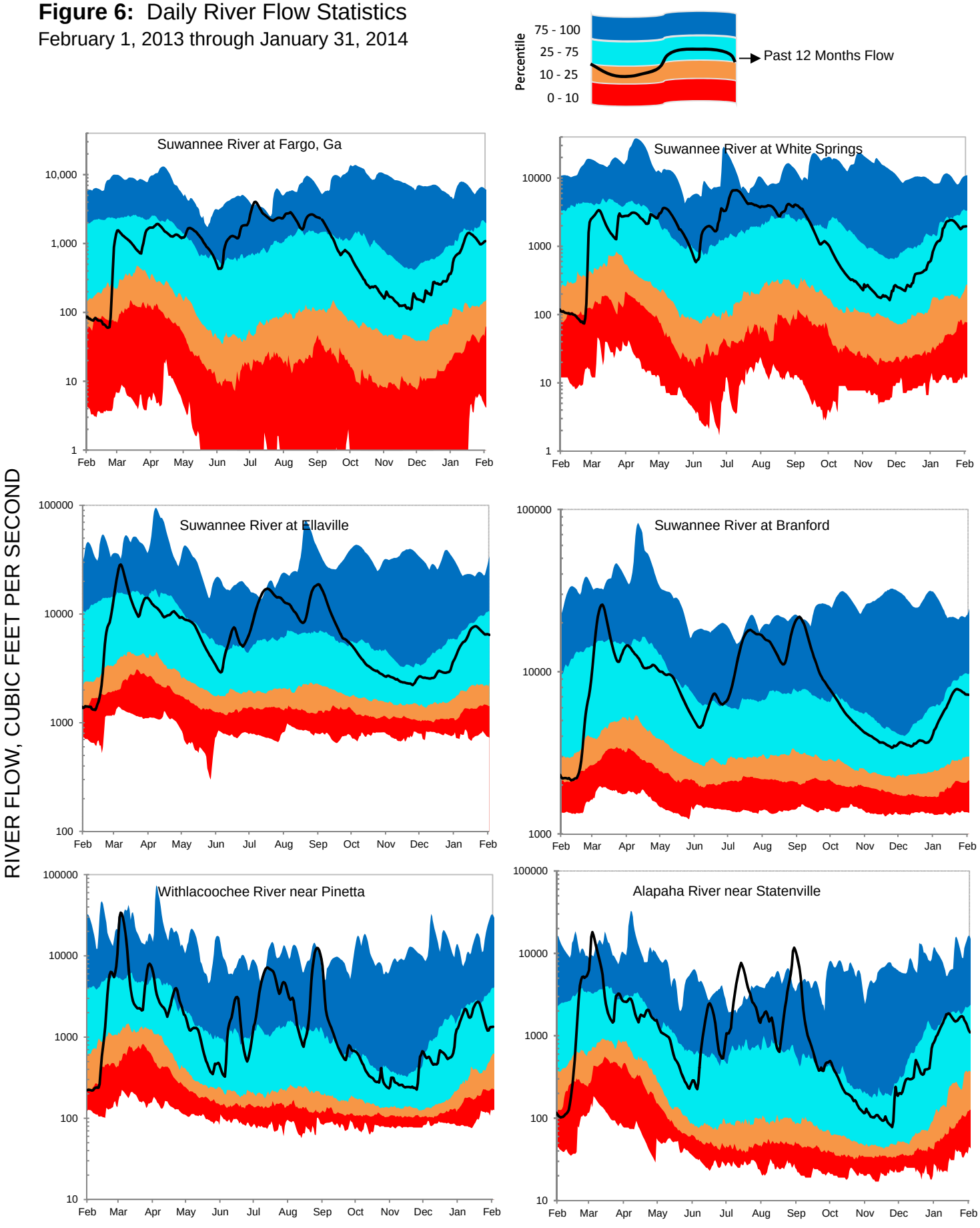
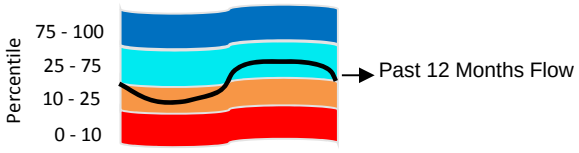
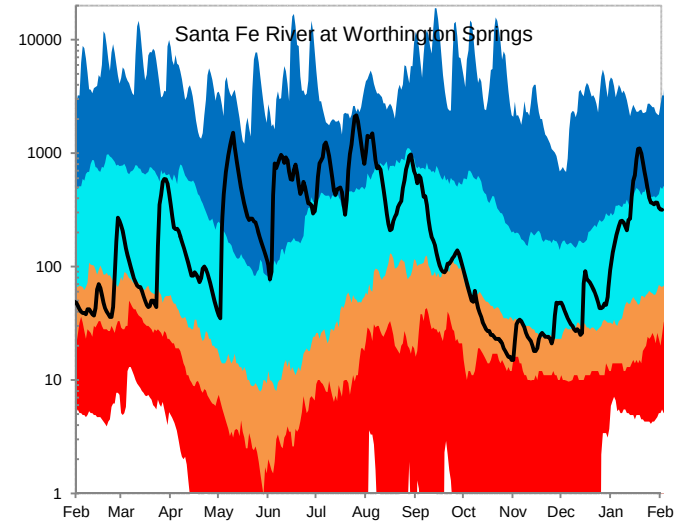
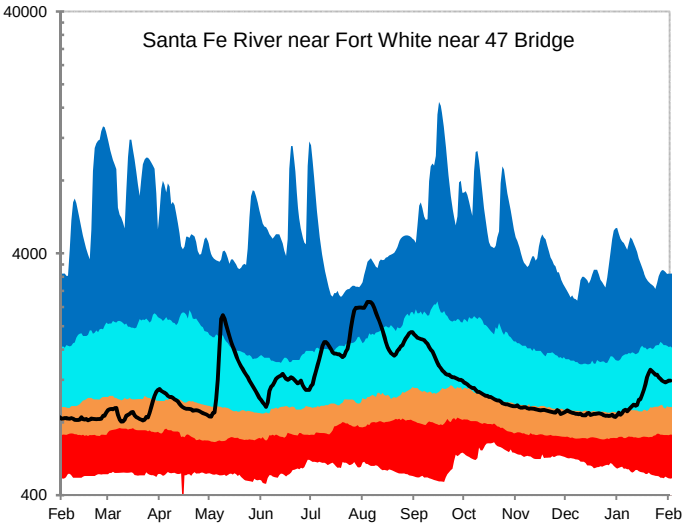


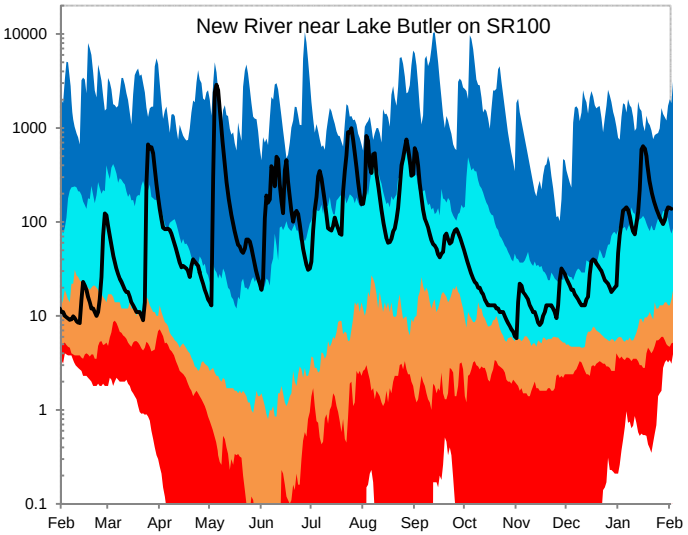
Figure 6, cont: Daily River Flow Statistics
February 1, 2013 through January 31, 2014

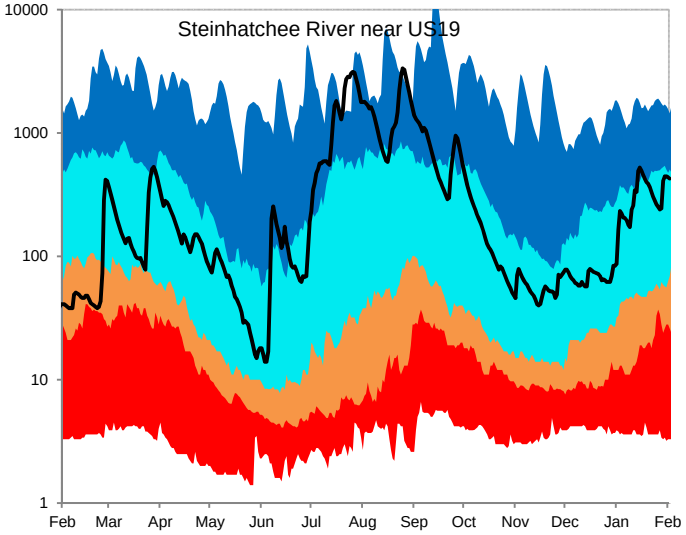


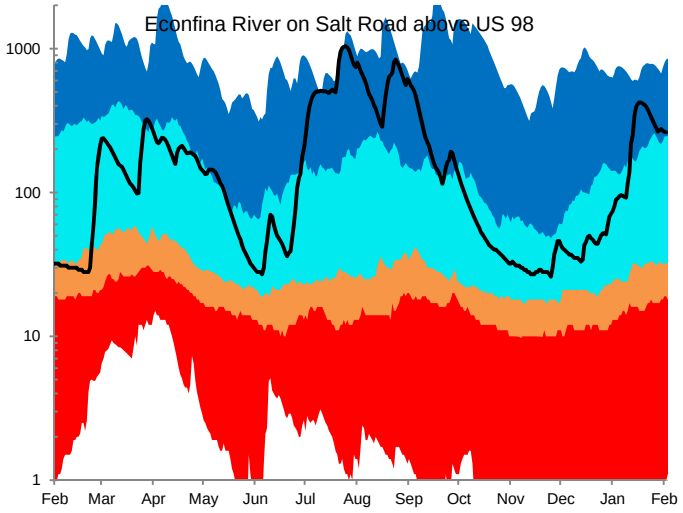
RIVER FLOW, CUBIC FEET PER SECOND

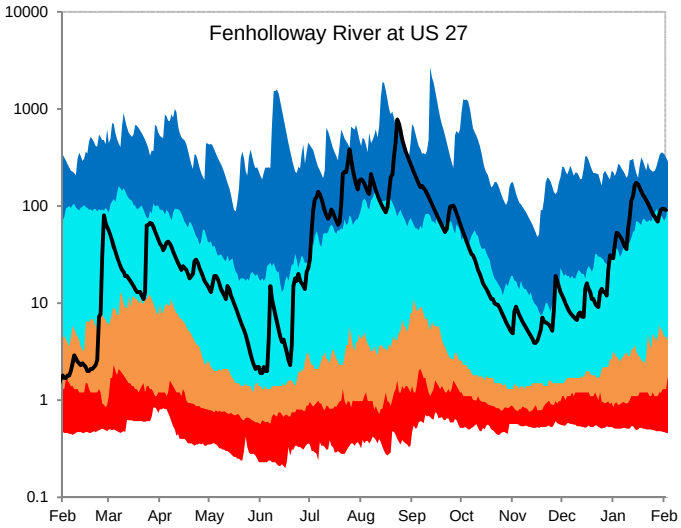












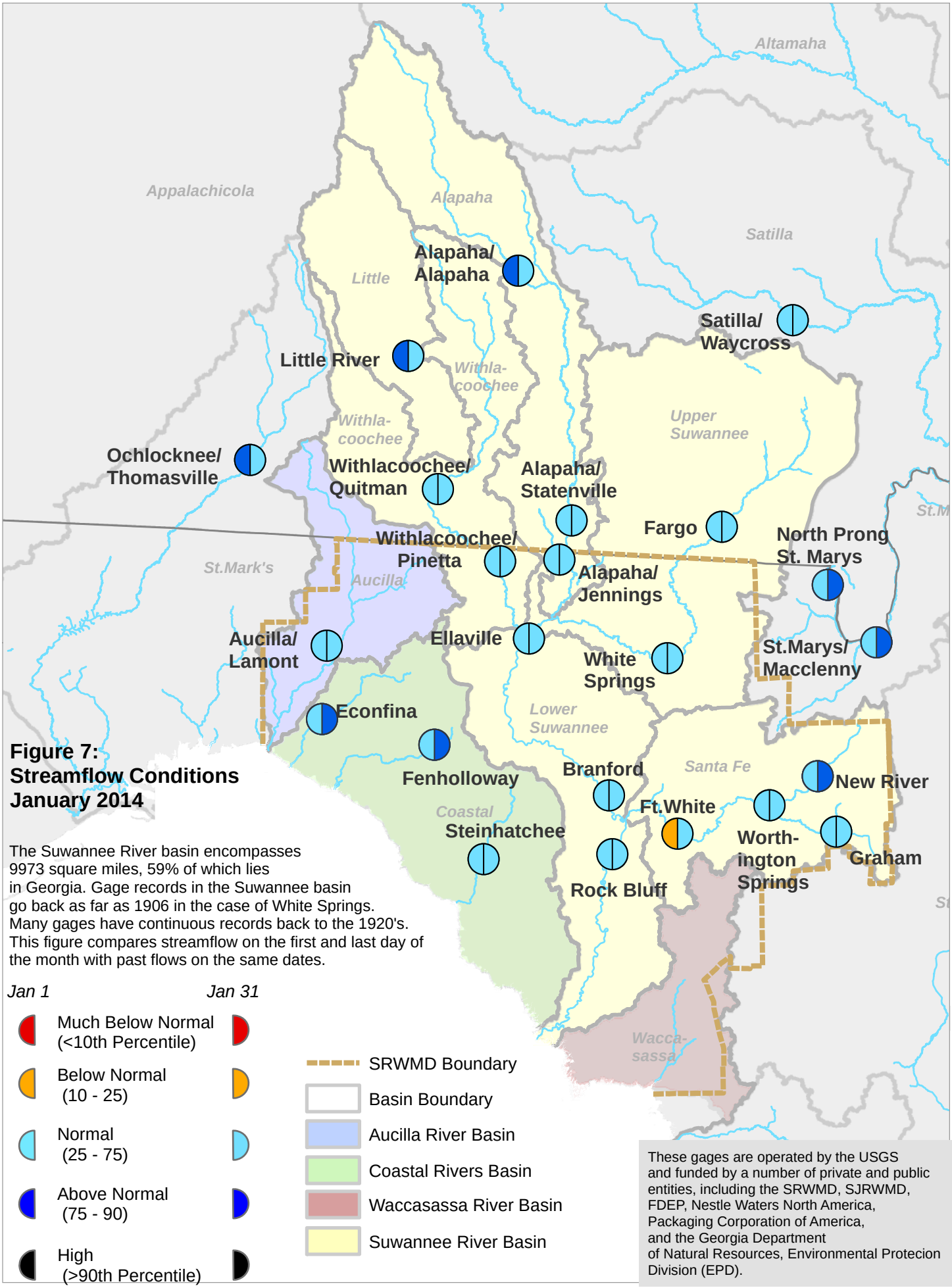
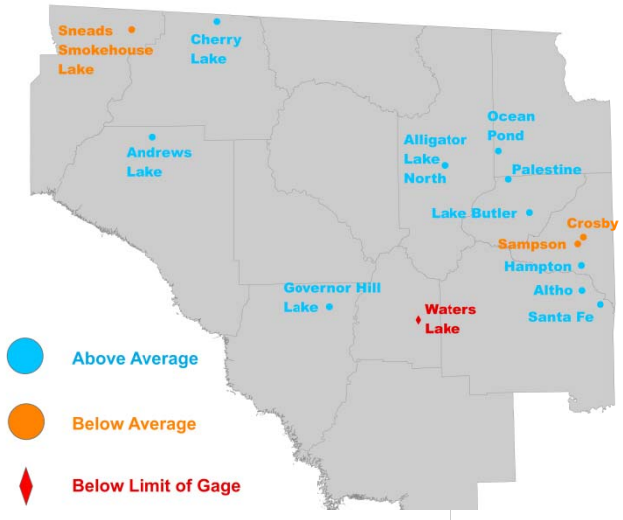
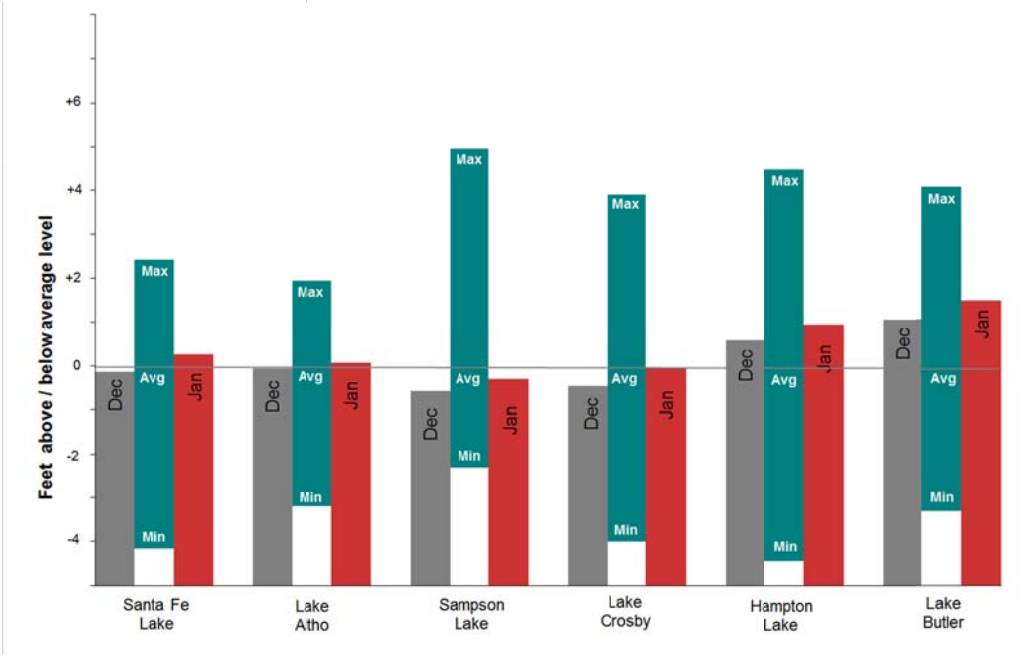

Altamaha
Appalachicola
Alapaha
Satilla
Alapaha/
Alapaha
Little
Satilla/
Waycross
Little River
Withla-
coochee
Upper
Suwannee
Withla-
coochee
Ochlocknee/
Thomasville
Withlacoochee/
Quitman
Alapaha/
Statenville
Fargo
North Prong
St. Marys
St.Mark's
Withlacoochee/
Pinetta
Aucilla
Alapaha/
Jennings
Aucilla/
Lamont
Ellaville
White
Springs
St.Marys/
Macclenny
Econfina
Lower
Suwannee
Fenholloway
Branford
Santa Fe
New River
Ft.White
Coastal
Steinhatchee
Worth-
ington
Springs
Graham
Rock Bluff
Wacca-
sassa
Figure 7:
Streamflow Conditions
January 2014
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.
Jan 1
Jan 31
Much Below Normal
(<10th Percentile)
Below Normal
(10 - 25)
Normal
(25 - 75)
Above Normal
(75 - 90)
High
(>90th 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,
FDEP, Nestle Waters North America,
Packaging Corporation of America,
and the Georgia Department
of Natural Resources, Environmental Protecion
Division (EPD).

Figure 8: January 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.



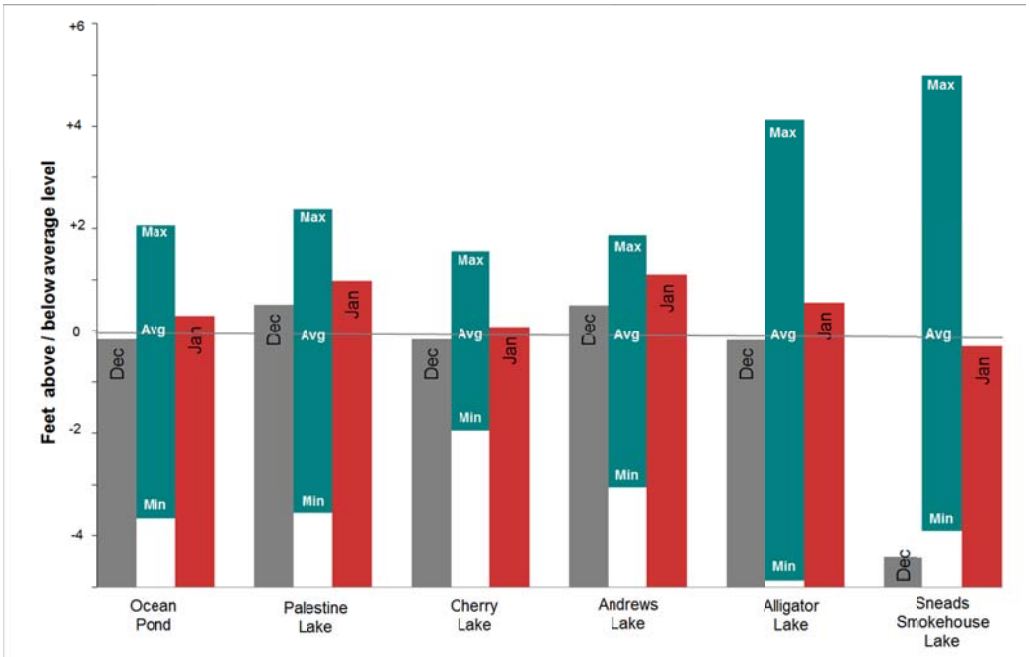
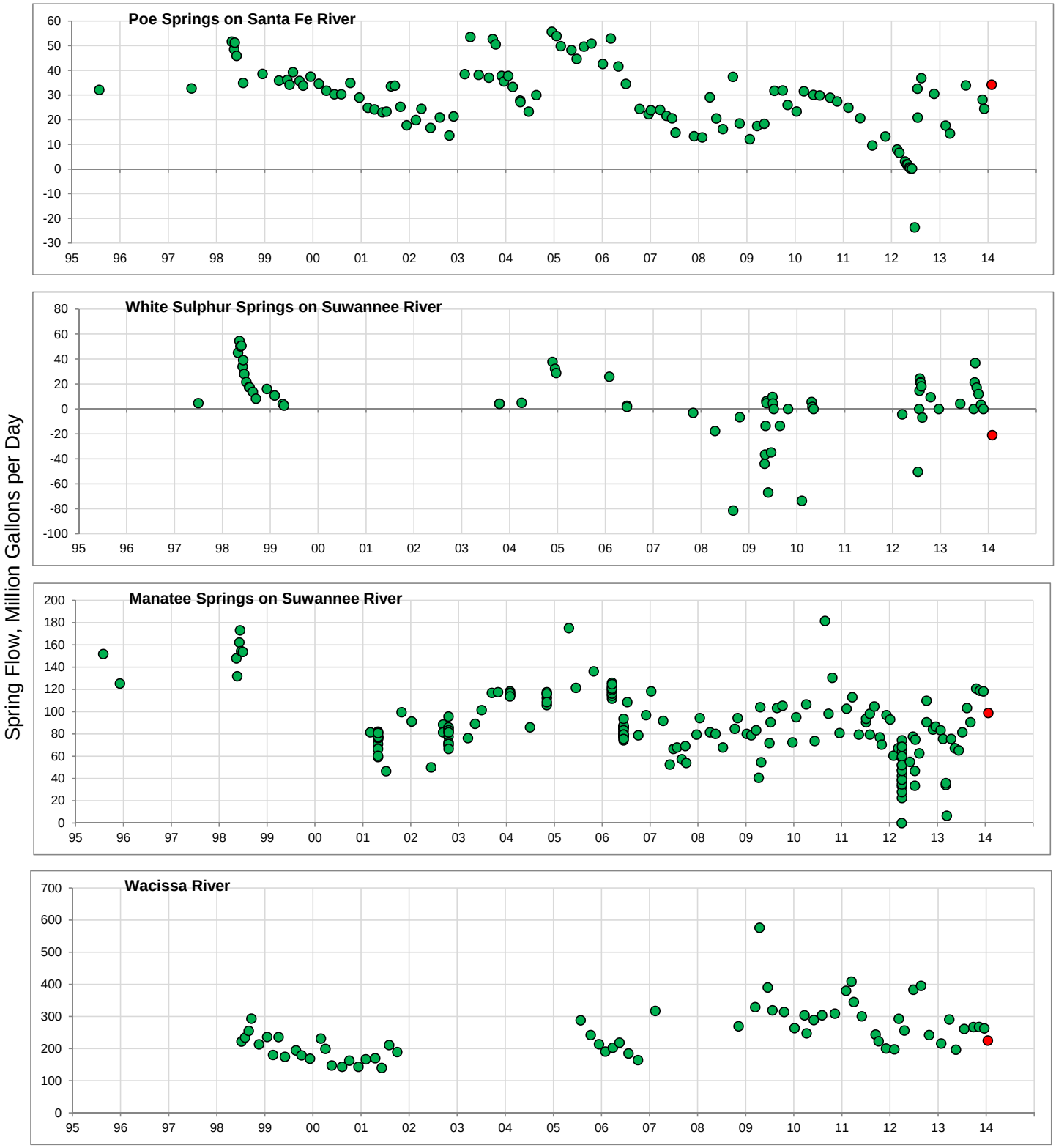


Figure 9: Quarterly Springflow Measurements

The SRWMD monitors water quality at 30 springs. Flow is measured at the time of the sampling. The springs below were measured in January 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.



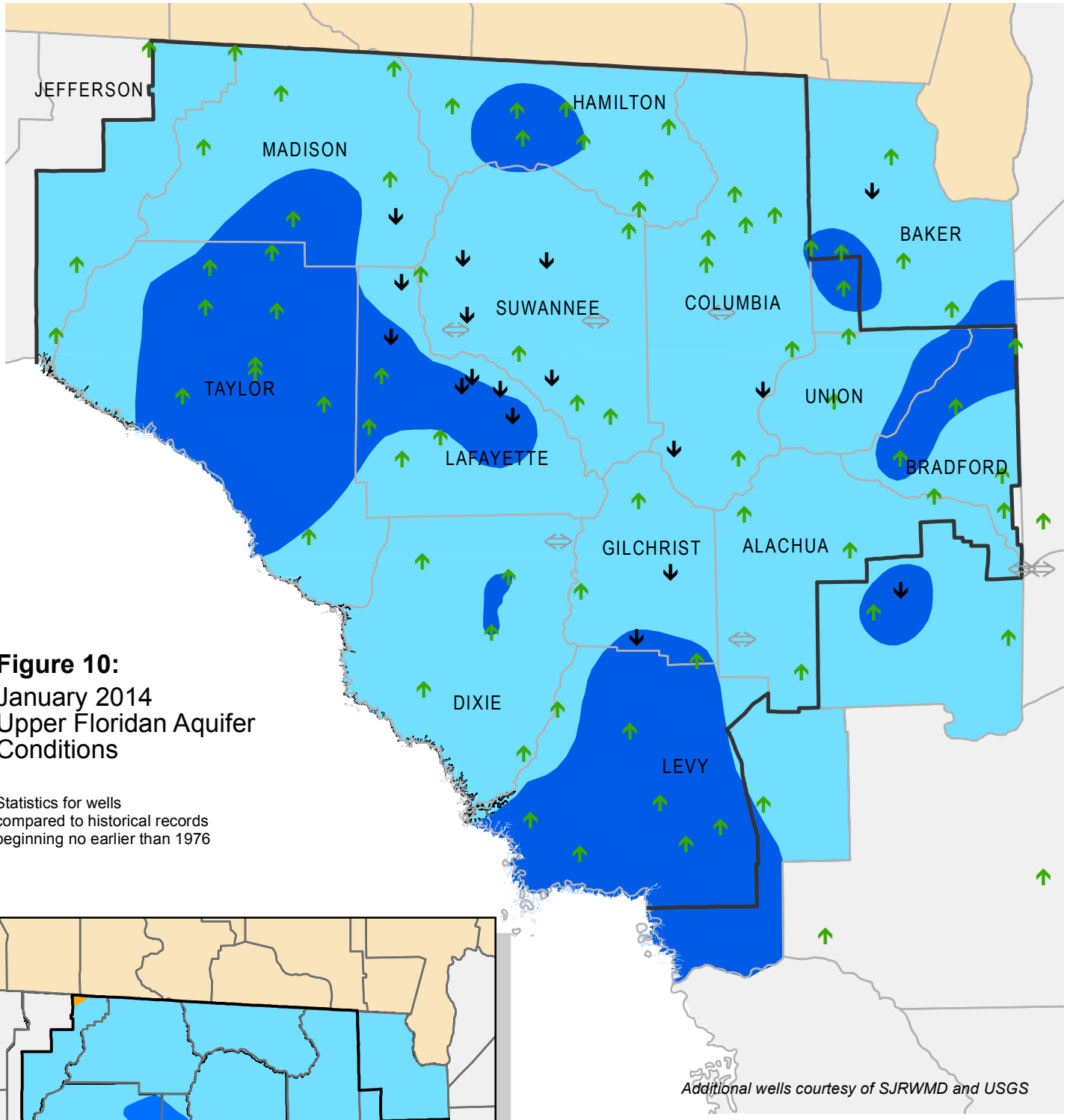
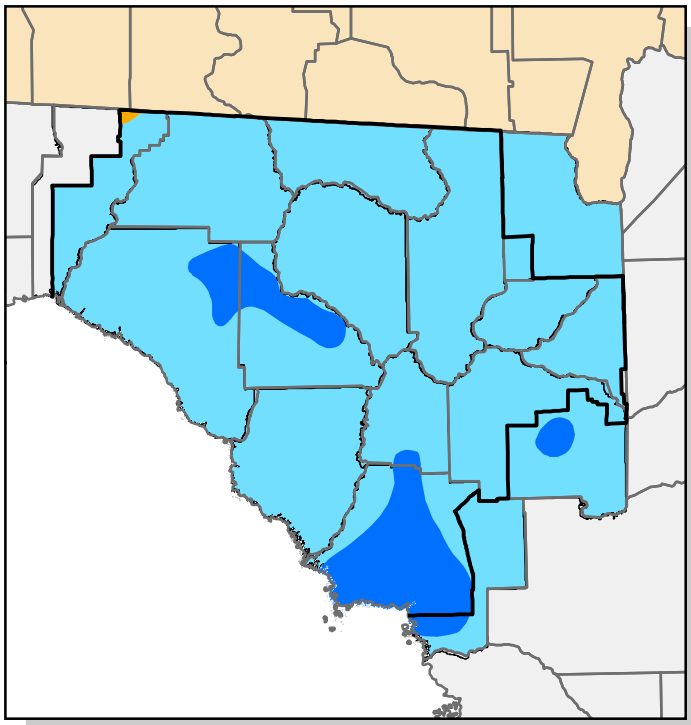


Figure 10:
January 2014
Upper Floridan Aquifer
Conditions

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



Inset: December 2013 Groundwater Levels

High
(Greater than 75th Percentile)

Normal
(25th to 75th Percentile)

Low
(10th to 25th Percentile)

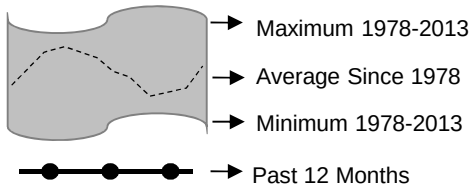
Extremely Low
(Less than 10th Percentile)

Increase/decrease in level since last month

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

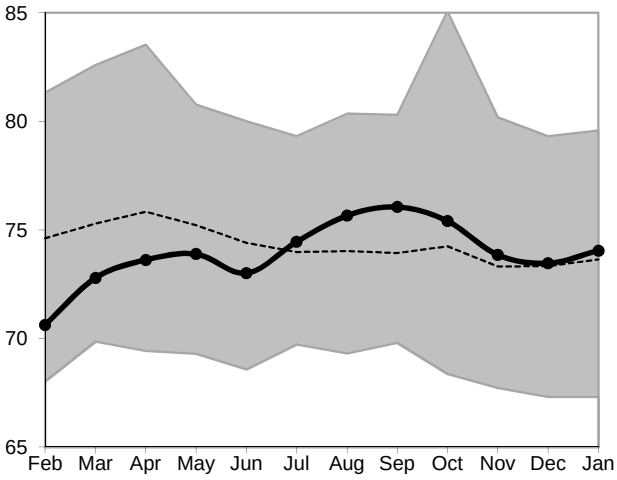
District Boundary

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

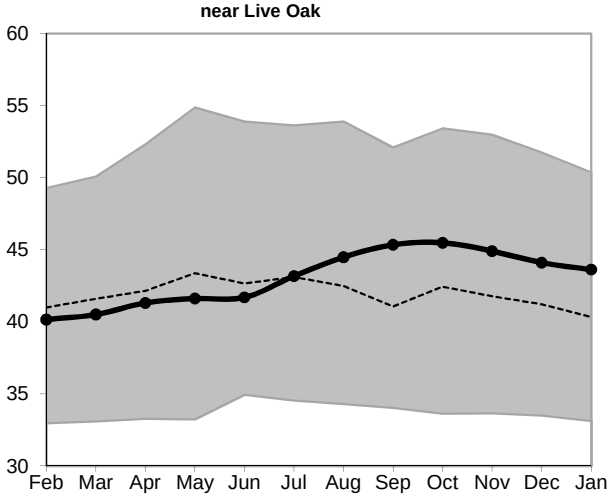


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

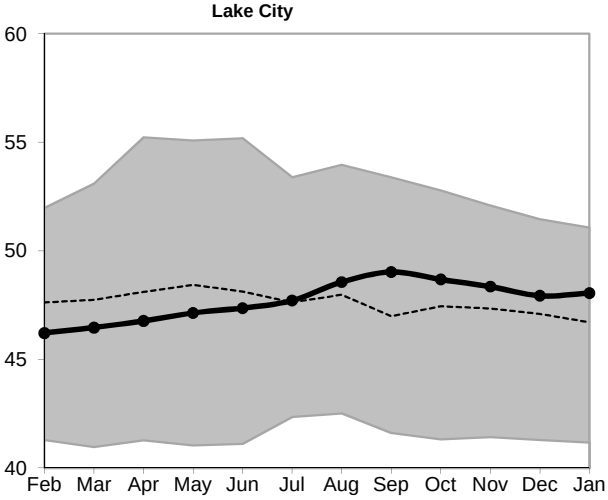
Madison County N010719001
near Greenville



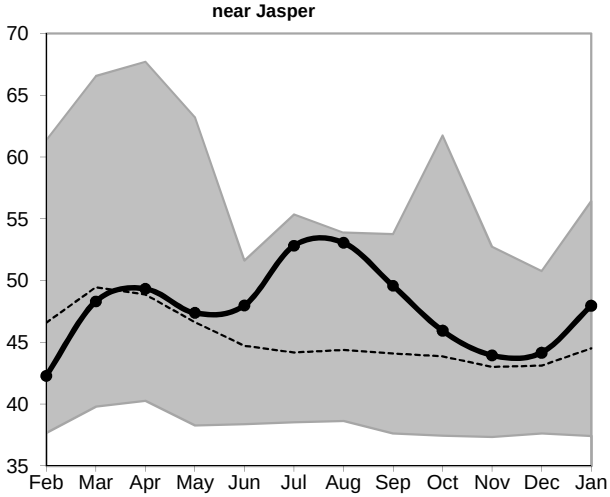
Suwannee County S021335001
near Live Oak



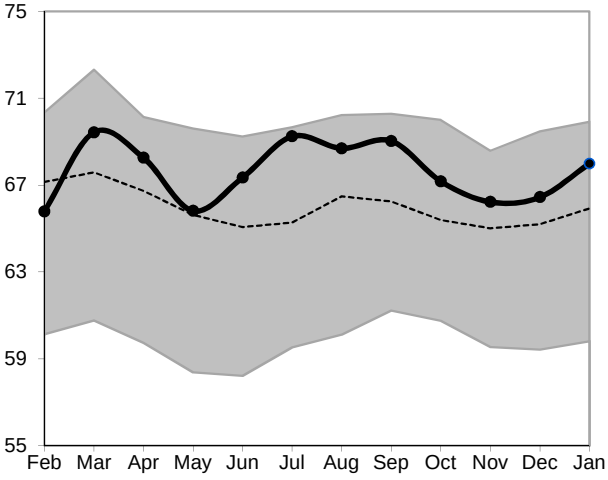
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S050701001
near Perry

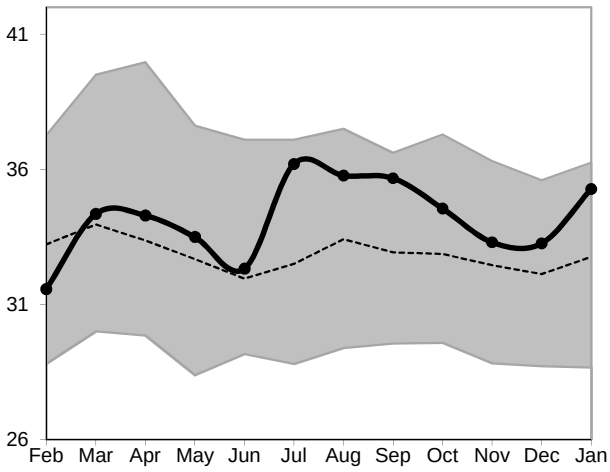
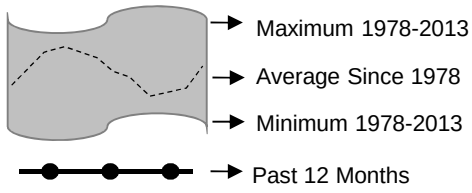
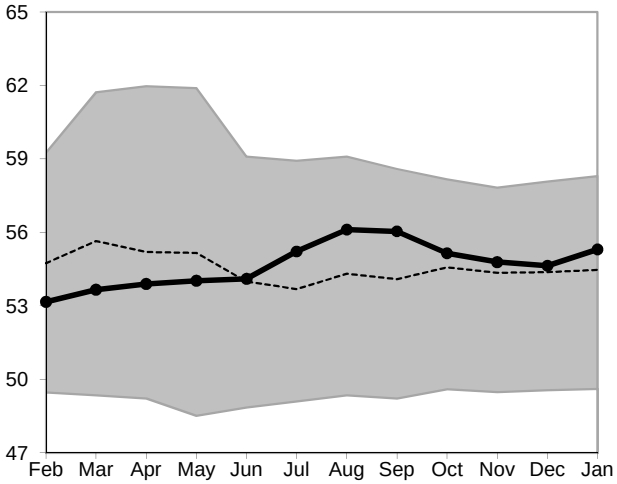


Figure 11, cont.: Groundwater Level Statistics
Levels February 1, 2013 through January 31, 2014
Period of Record Beginning 1978

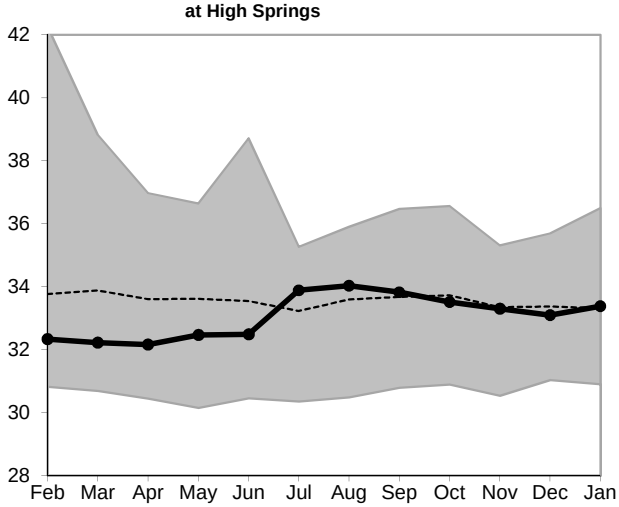


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

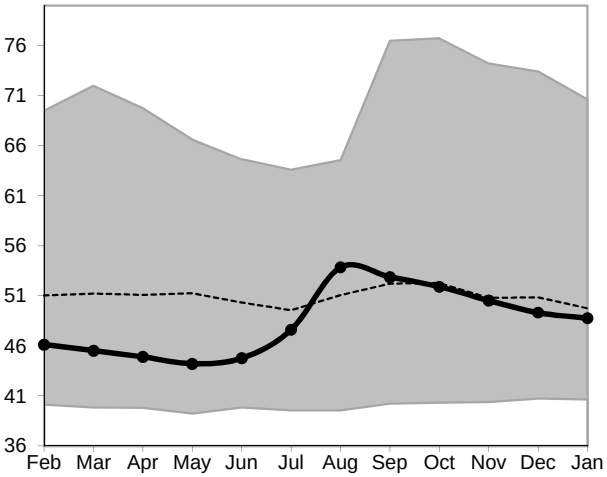
Union County S051933001
near Lake Butler



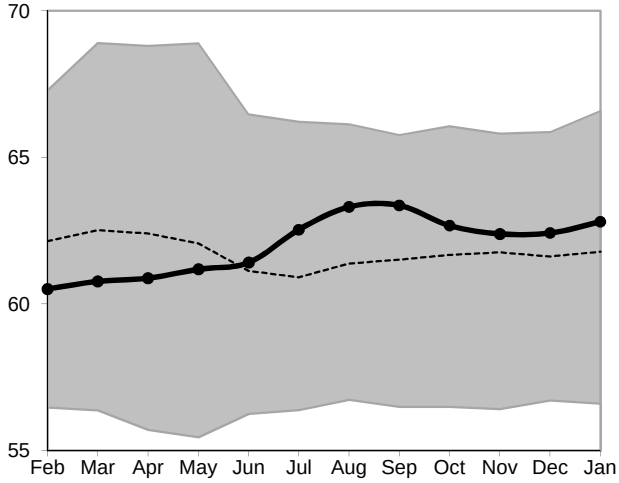
Alachua County S081703001
at High Springs



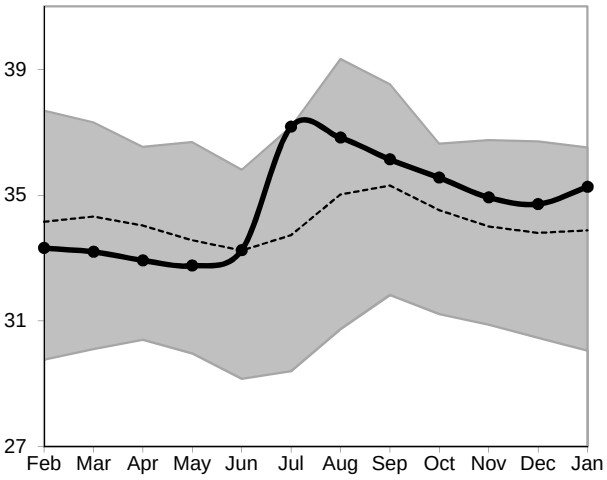
Gilchrist County S091607001
near Trenton



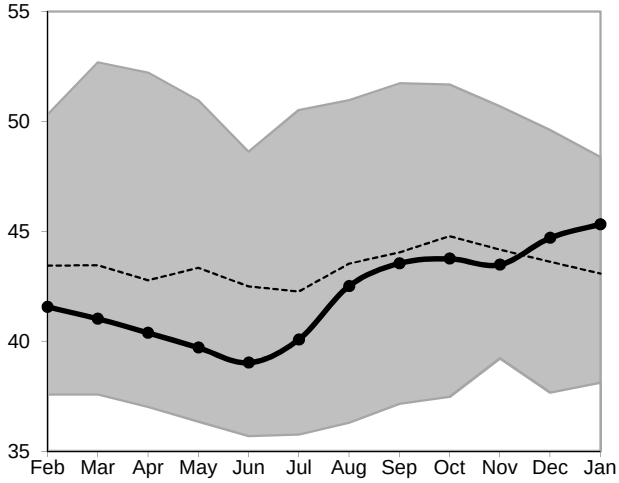
Bradford County S072132001
near Graham



Dixie County S101210001
at Cross City



Levy County S131736001
near Bronson



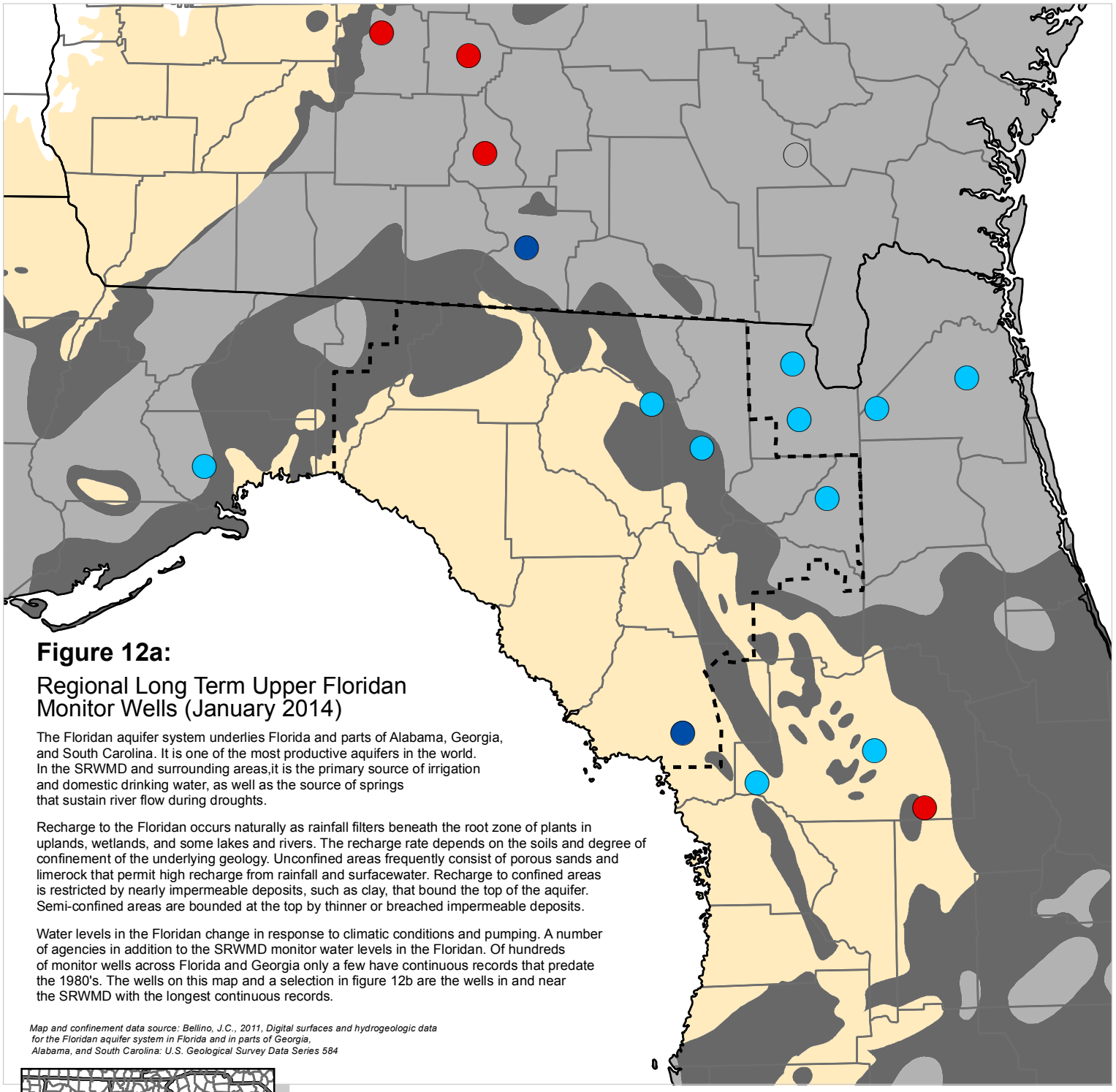


Figure 12a:

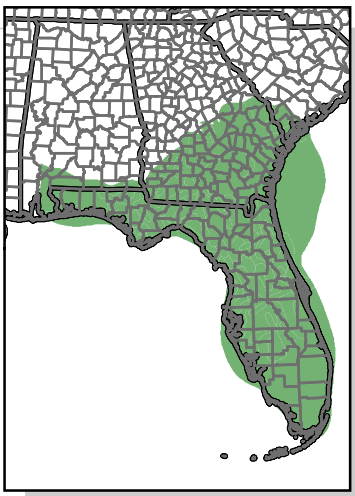
Regional Long Term Upper Floridan Monitor Wells (January 2014)

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

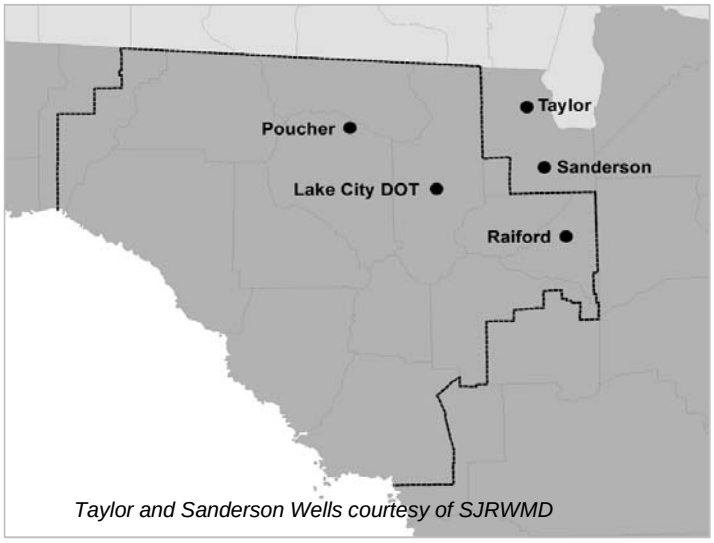
- Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
- Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
- Unconfined: Upper confining unit is absent or very thin. Recharge is high.

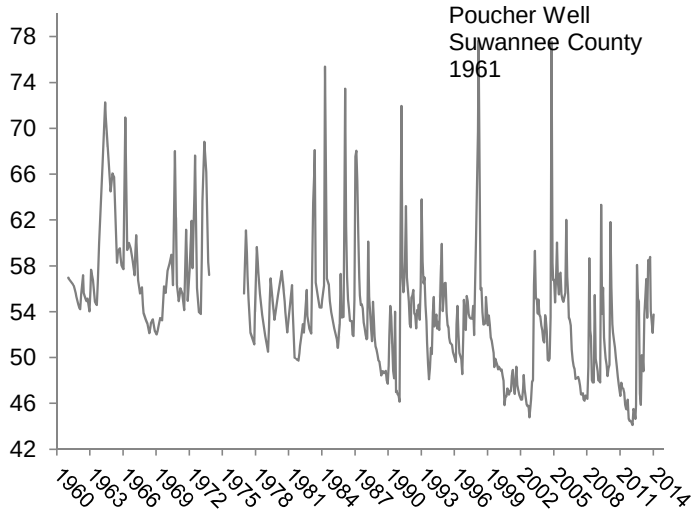
Percentile of Most Recent Water Level Relative to Entire Record

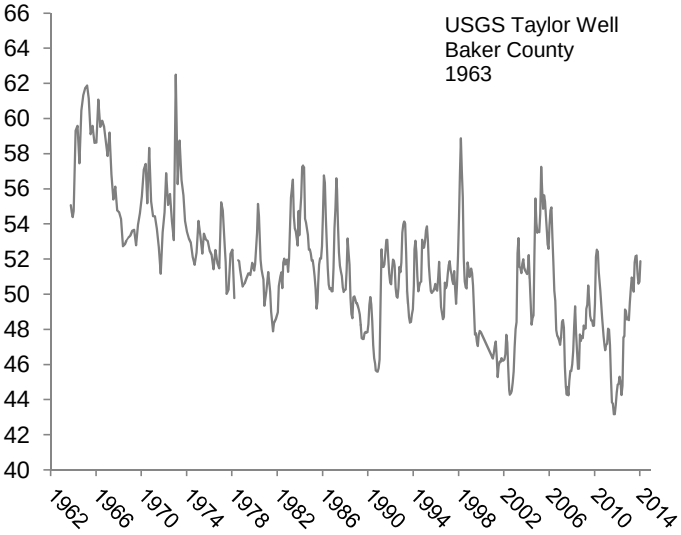
- High (Greater than 75th Percentile)
- Normal (25th to 75th Percentile)
- Low (10th to 25th Percentile)
- Extremely Low (Less than 10th Percentile)
- Not Available
- SRWMD Boundary

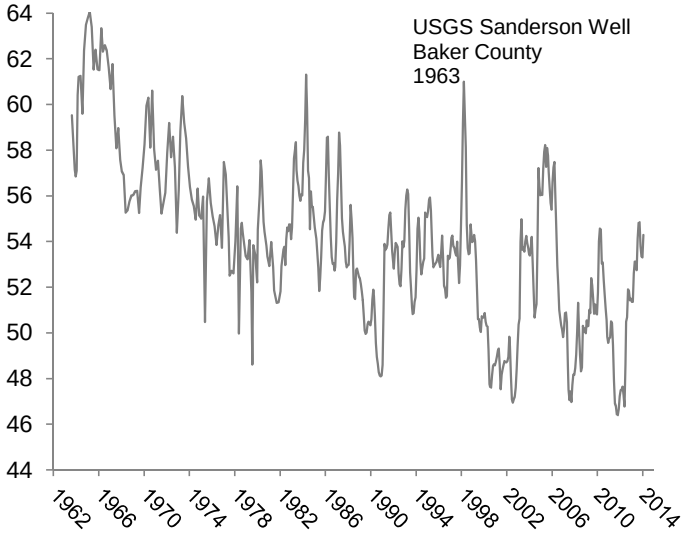
Figure 12b: Regional Long Term Upper Floridan Levels

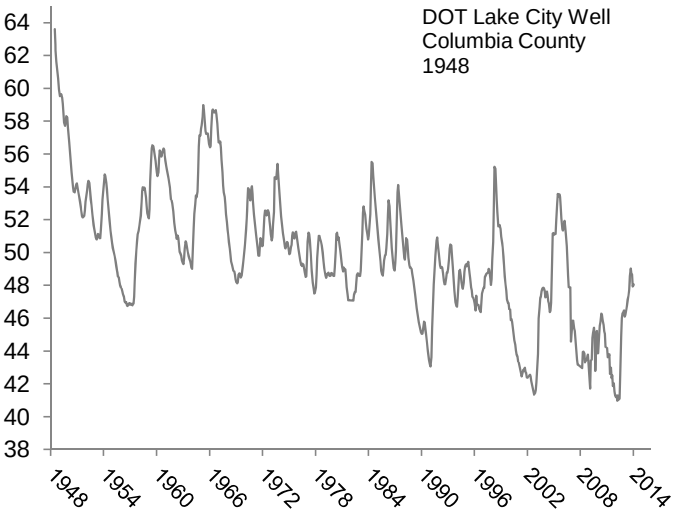
January 2014

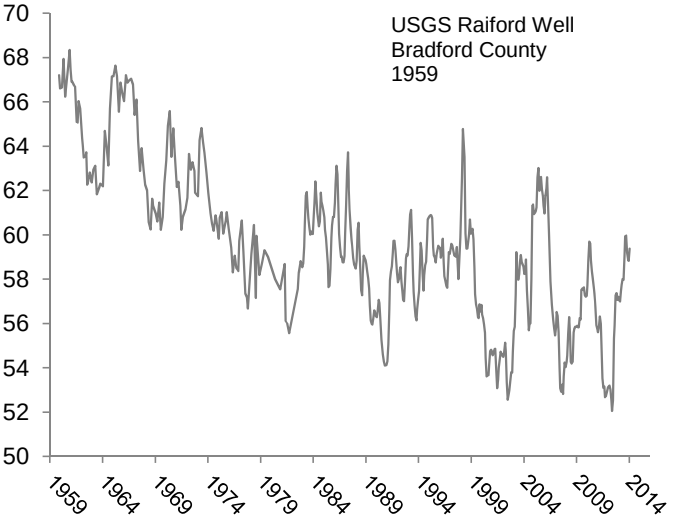












Upper Floridan Aquifer Elevation above NGVD 1929, Feet