

## MEMORANDUM

TO: Governing Board

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

THRU: David Still, Executive Director *CA for*  
Jon Dinges, Department Director *JMD*

DATE: February 4, 2011

RE: January 2011 Hydrologic Conditions Report for the District

### RAINFALL

- Average District-wide rainfall in January was 6.02", which is 163% of the long-term average of 3.69" (Table 1, Figure 1). Taylor, Lafayette, Dixie, Suwannee, and Columbia counties received between 6" and 8", with isolated areas up to 9" (Figure 2). Rainfall was widespread, and all counties saw above-normal totals (Figure 3). The relatively even distribution occurred through seven low-intensity fronts. The highest recorded hourly accumulation was 1.14", observed at Rosewood Tower in Levy County. January totals ended three months of near-record-breaking dry weather.
- The 12-month District average of 53.34" was near the long-term average of 54.68". However, significant deficits approaching 20" remained in the upper Santa Fe, Suwannee, and Aucilla River basins (Figure 4). Figure 5 shows the change in annual deficits beginning in 1998.

### SURFACEWATER

- **Rivers:** The low intensity fronts and extremely dry antecedent conditions resulted in little reaction by most rivers. With the exception of the Withlacoochee River near Pinetta, flows at all major Suwannee River and tributary gages ended the month at or below the 10<sup>th</sup> percentile of daily values, meaning more than 90% of daily mean flow records have been higher during this time of year. The Suwannee River at White Springs rose only 1.4 feet since December, and at Branford the rise was just over 6 inches. The Withlacoochee at Pinetta rose nearly 10", and finished the month with flows considered below normal. Flow at the groundwater-dominated Santa Fe River near Fort White remained constant throughout the month. Coastal rivers reacted well to the increased precipitation, ending the month with flow conditions considered normal for the time of year. The Waccasassa River, however, remained below the 10<sup>th</sup>

percentile. Discharge statistics for six river stations are presented in Figure 6 and streamflow conditions for major gages are shown in Figure 7.

- **Lakes:** Levels at monitored lakes remained stable or rose in January, with an average rise of 0.3 feet. All the lakes remained below their historic average levels. Alligator Lake, Waters Lake and Governor Hill Lake were below the minimum measurable stage. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for six lakes.
- **Springs:** Average January flow relative to historical flows is shown for five spring systems in Figure 9.

## GROUNDWATER

Levels dropped in 63% of monitored upper Floridan Aquifer wells, but fell only by an average of less than an inch (Figure 10). Conditions averaged across the District using monthly statistics fell to the 26<sup>th</sup> percentile from the 28<sup>th</sup> percentile in December, based on records beginning no earlier than 1978. Conditions based on the entire period of record fell below the 25<sup>th</sup> percentile. Average conditions in the Suwannee and Santa Fe Basins fell below the 20<sup>th</sup> percentile of all observations. Three wells near the Taylor-Lafayette County border rose to levels considered above normal. Statistics for a representative sample of wells are shown in Figure 11. Figure 12 shows statistics for 5 wells in or near the District with continuous records that predate the mid-1970's.

## HYDROLOGICAL/METEOROLOGICAL/WATER USE INFORMATION

- Agricultural water use on 106 monitored overhead irrigations systems declined from an average daily application rate of 0.10 inches in December to a rate of 0.05 inches in January. Figure 13 shows average application and evapotranspiration since 2008.
- The Palmer Drought Severity Index (PDSI), a climatological tool produced by the National Weather Service, evaluates the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather using precipitation, temperature, and soil moisture data. The PDSI indicated mild drought during the last week of January.
- The U.S. Geological Survey categorized the middle and lower Suwannee River Basin as experiencing moderate hydrological drought, and the upper basin and the Santa Fe River basin as below normal.

## CONSERVATION

A Phase I Water Shortage Advisory is currently in effect. Users are urged to voluntarily reduce consumption. Homeowners and others within the District are required to limit landscape irrigation to one day per week during the winter months, based on a year-round 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. The District offers a variety of free water conservation information to the public via its website and by request.

The hydrologic conditions report is compiled in compliance with Chapter 40B-21.211, Florida Administrative Code, using data collected from the following: rainfall (radar-derived estimate), groundwater levels (113 wells), surfacewater levels (6 lakes and 11 rivers), river flows (15 stations), spring flows (5 stations), monitored agricultural water use (106 stations), and general information such as drought indices and forecasts. Data are provisional, and statistics are updated as revised data become available.

MW/dd

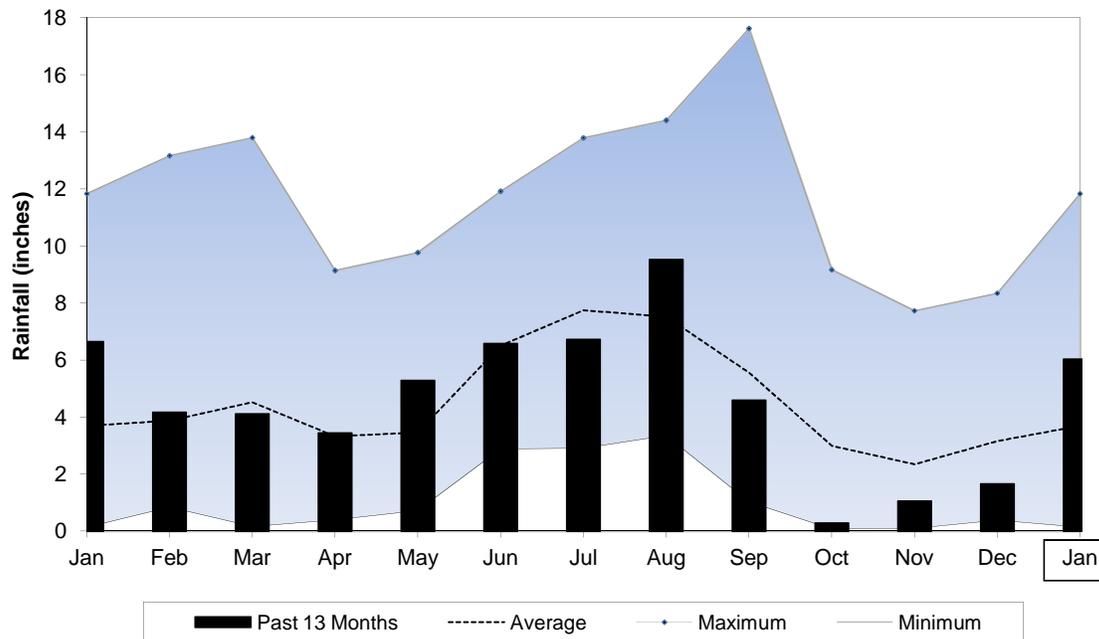
**Table 1: Estimated Rainfall Totals**

County	Jan-2011	Jan Average	Last 3 Months	Last 12 Months
Alachua	4.77	3.39	6.64	44.83
Baker	6.90	3.48	9.24	45.38
Bradford	4.56	2.90	6.35	38.25
Columbia	6.36	3.43	8.88	47.84
Dixie	6.37	3.54	8.96	65.19
Gilchrist	5.53	4.58	8.09	49.86
Hamilton	5.88	4.31	8.60	47.87
Jefferson	5.04	4.35	8.44	48.62
Lafayette	6.82	4.09	10.28	56.57
Levy	5.84	3.99	7.43	65.57
Madison	5.38	3.93	8.61	50.43
Suwannee	6.98	4.20	10.12	52.39
Taylor	6.77	4.10	10.10	57.62
Union	5.14	4.00	7.15	45.25

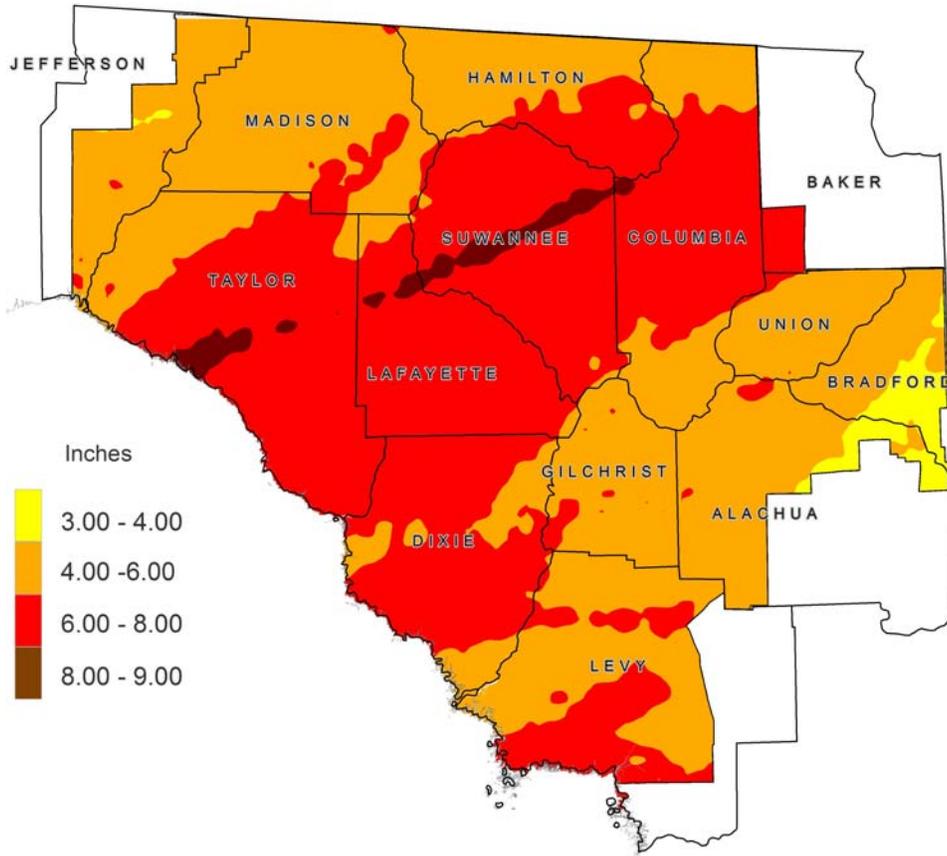
January 2011 Average: 6.02  
 Historical January Average (since 1932): 3.69  
 Historical 12-month Average (since 1932): 54.68  
 Past 12-Month Total: 53.34  
 12-month Rainfall Deficit: -1.34

(Rainfall reported in inches)

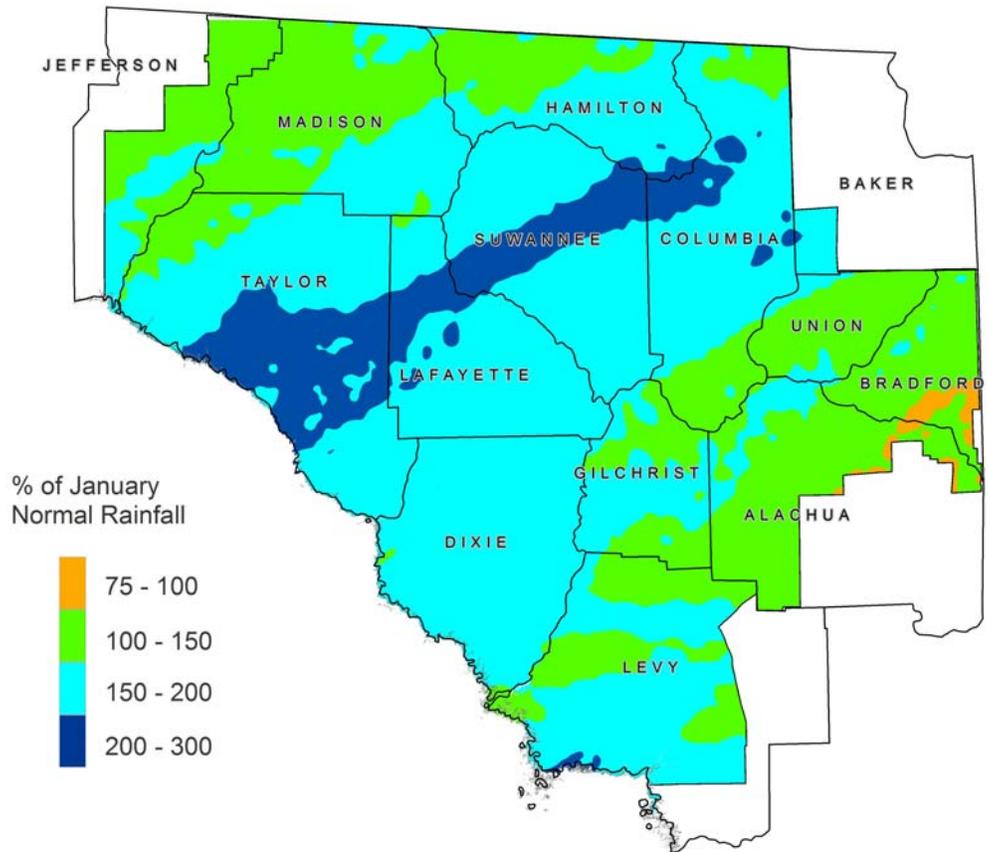
**Figure 1: Comparison of District Monthly Rainfall**



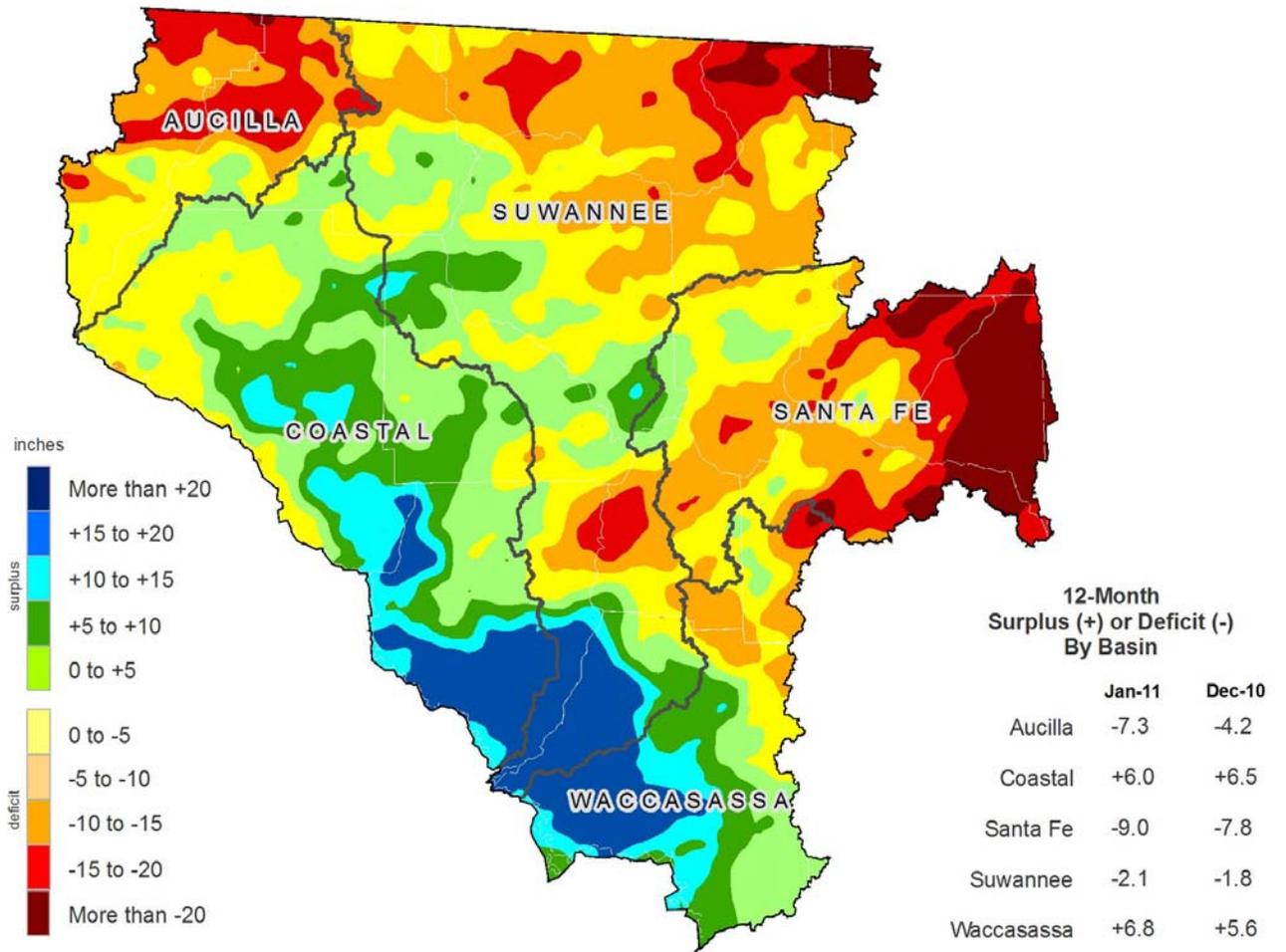
**Figure 2: January 2011 Rainfall Estimate**



**Figure 3: January 2011 Percent of Normal Rainfall**

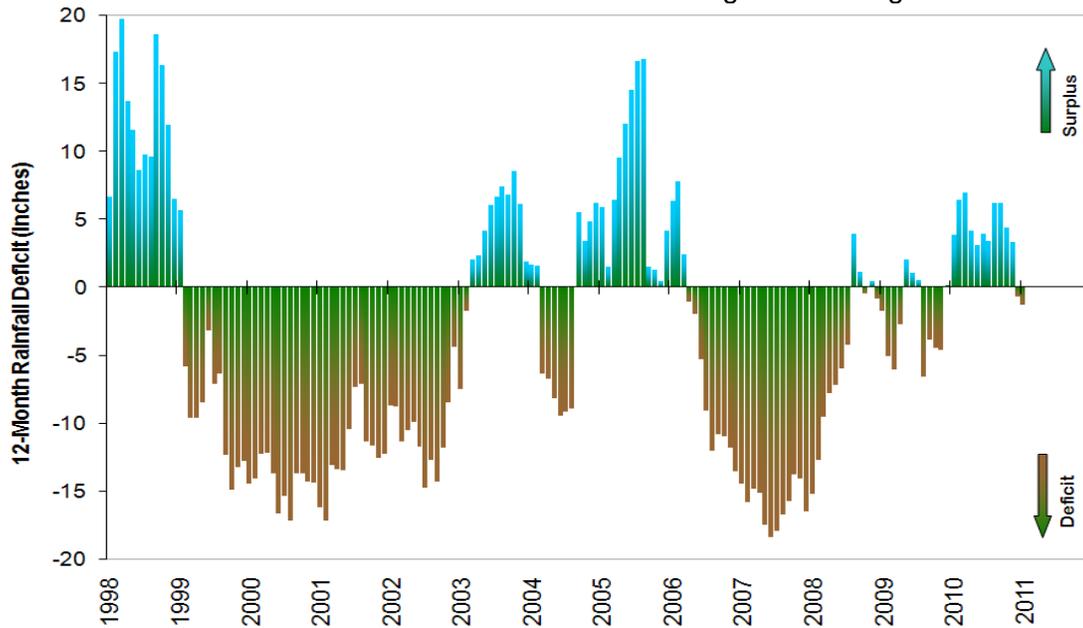


**Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin Ending January 2011**

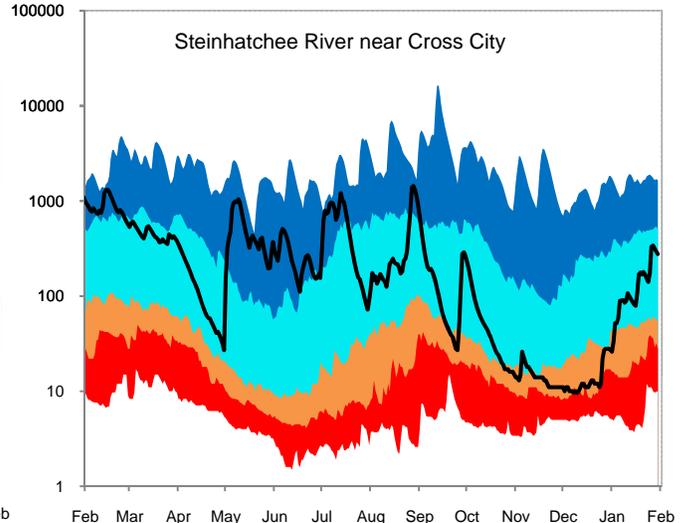
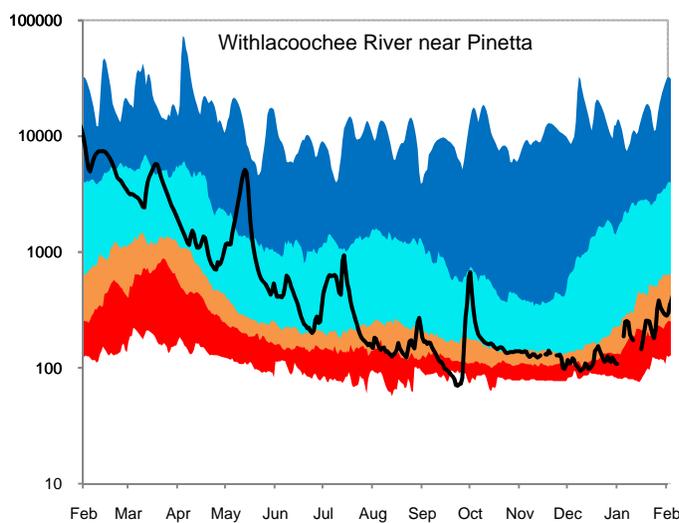
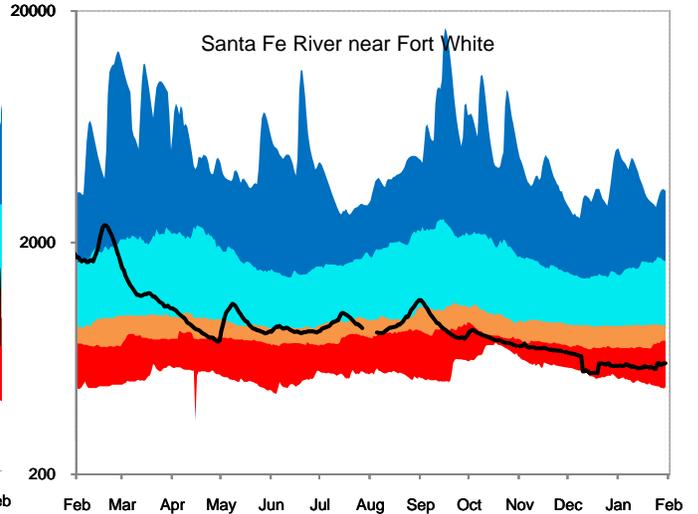
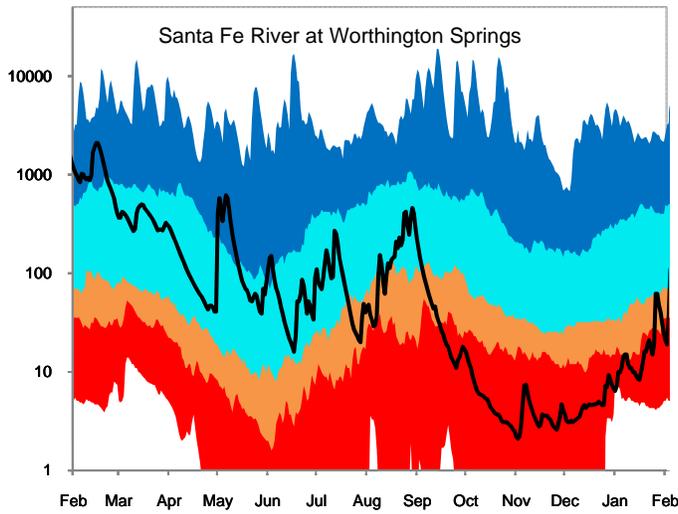
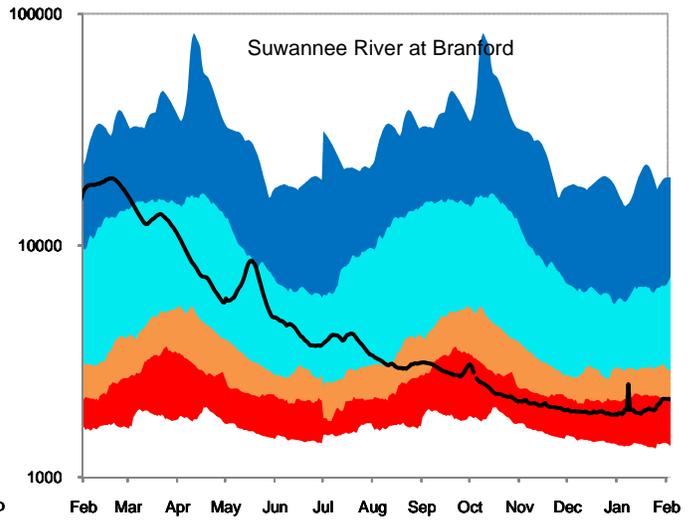
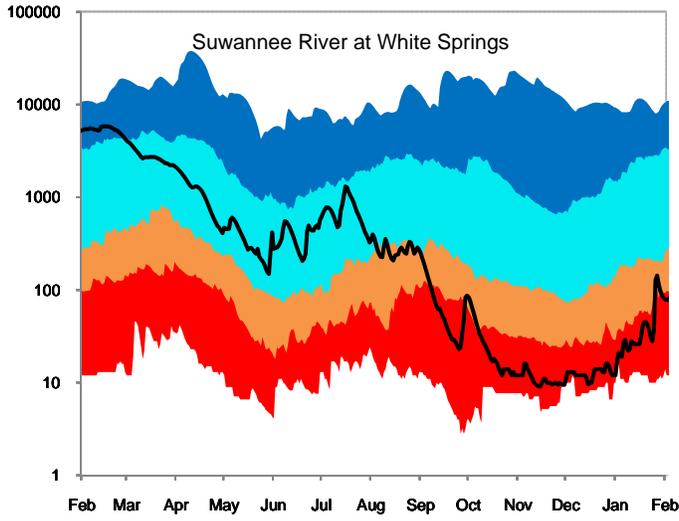
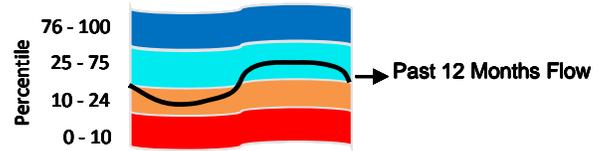


**Figure 5: 12-Month Rolling Rainfall Deficit Since 1998**

Difference between observed 12-month rainfall and the long-term average over the same period

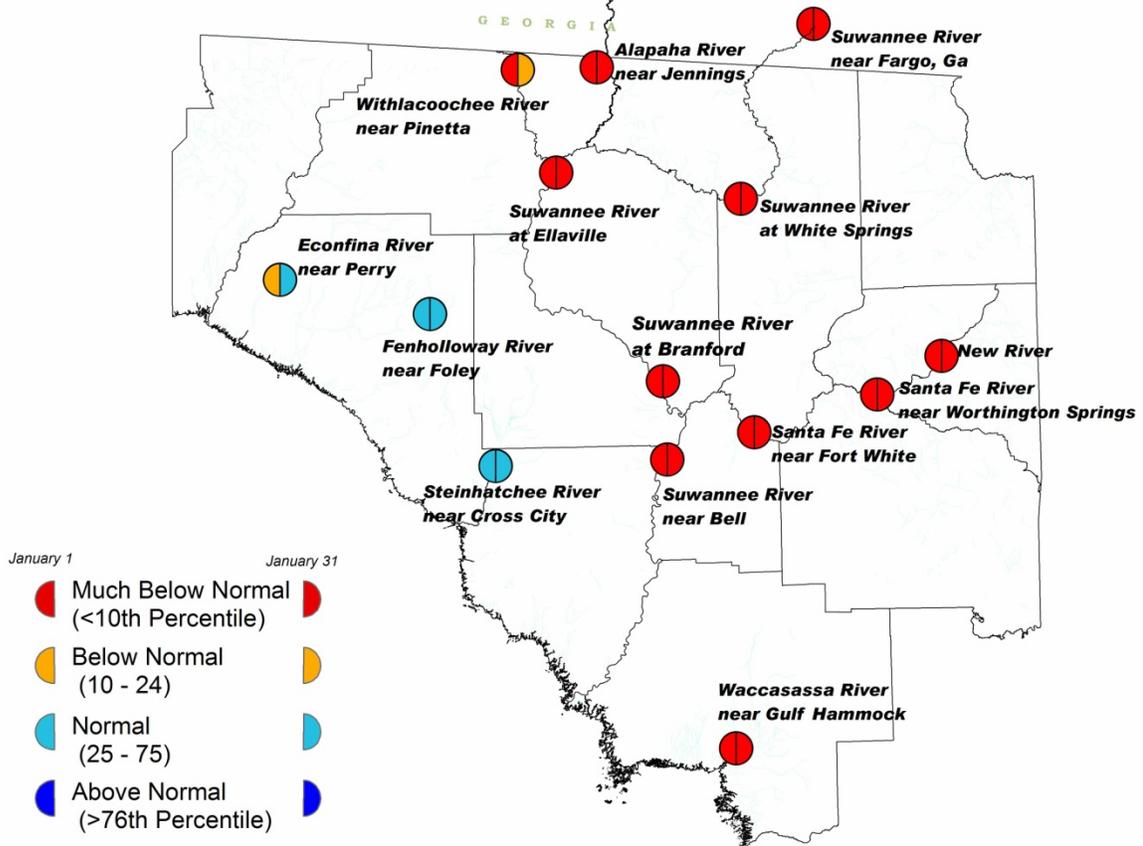


**Figure 6: Daily River Flow Statistics**  
February 1, 2010 through January 31, 2011

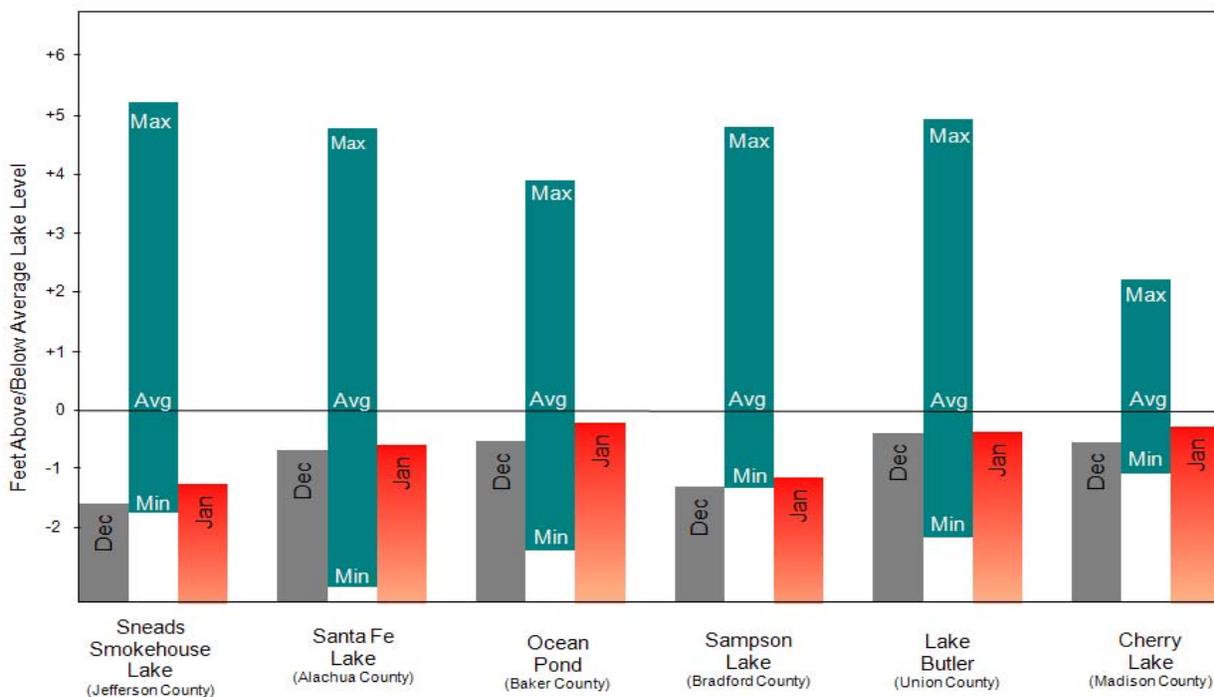


RIVER FLOW, CUBIC FEET PER SECOND

**Figure 7: January 2010 Streamflow Conditions**

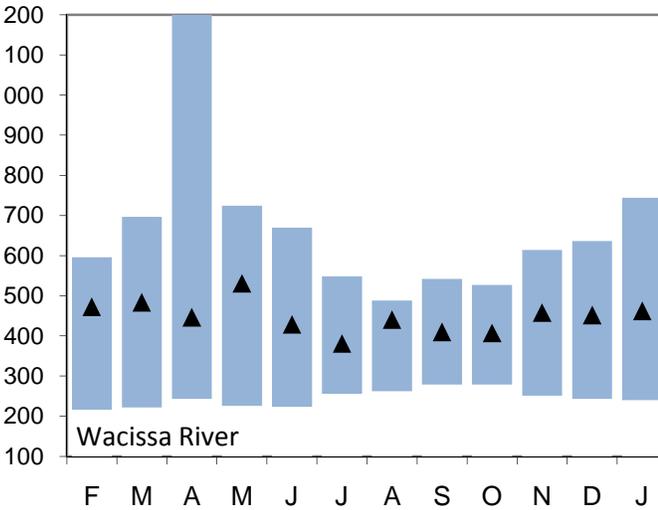
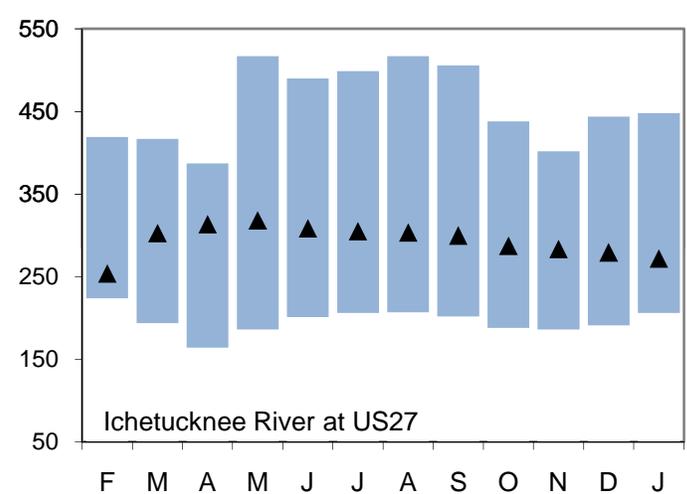
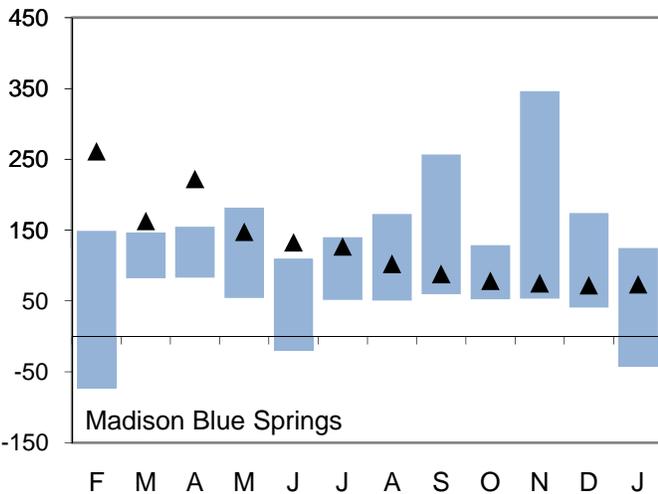
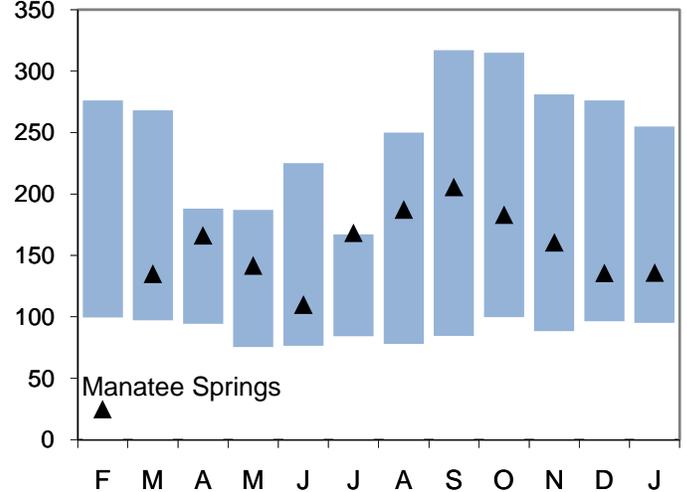
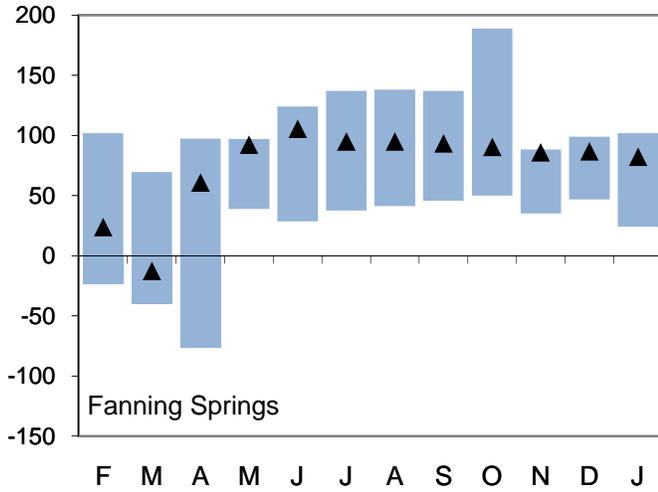
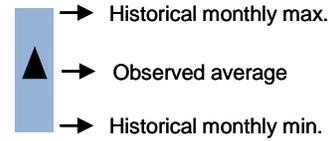


**Figure 8: Lake levels, relative to historic maximum, minimum, and average levels.**



### Figure 9: Monthly Springflow Statistics

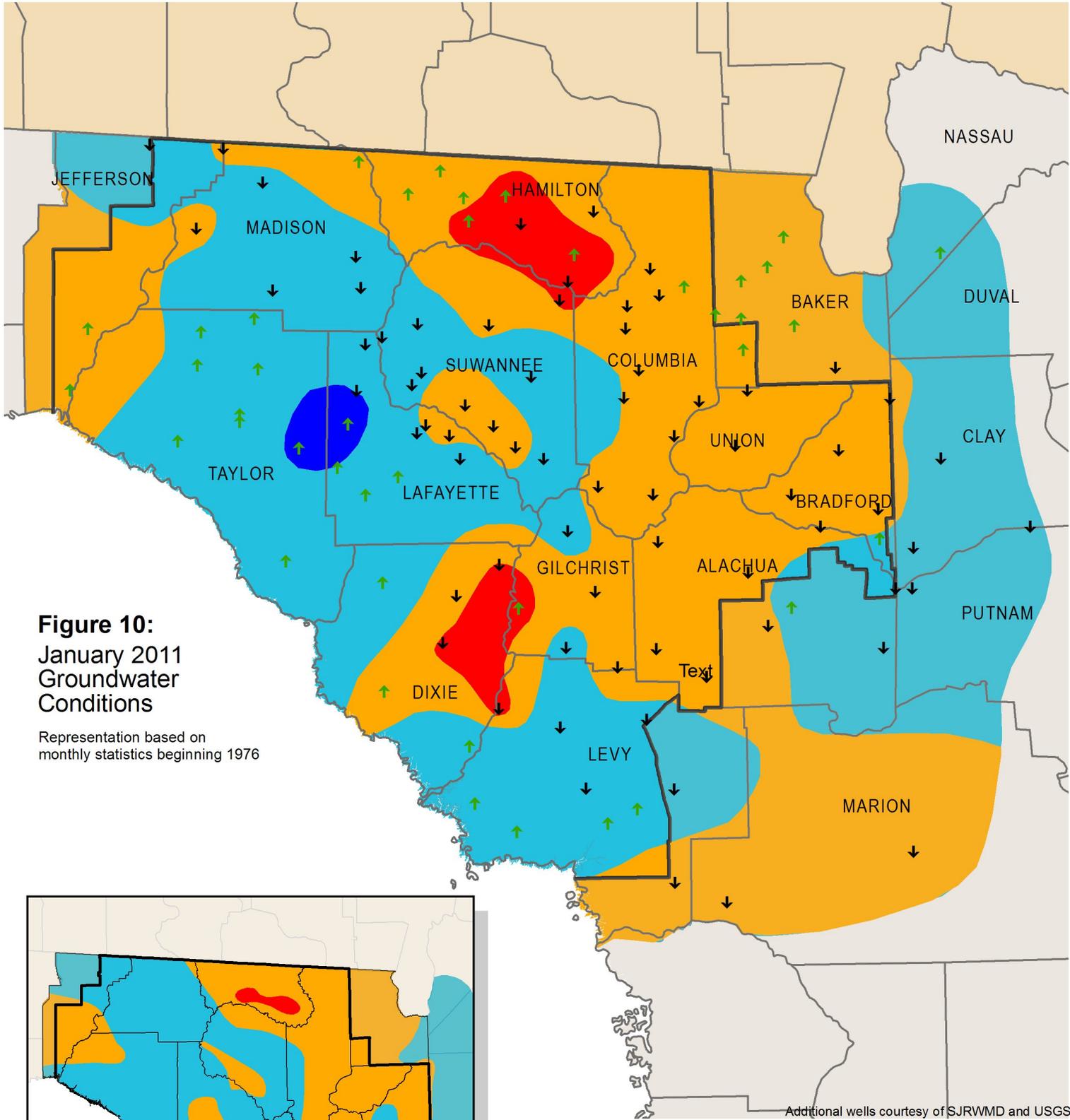
Flows February 1, 2011 through January 31, 2011  
 Springflow data are given in cubic feet per second.  
 Period of record beginning 2002. Data are provisional.



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.

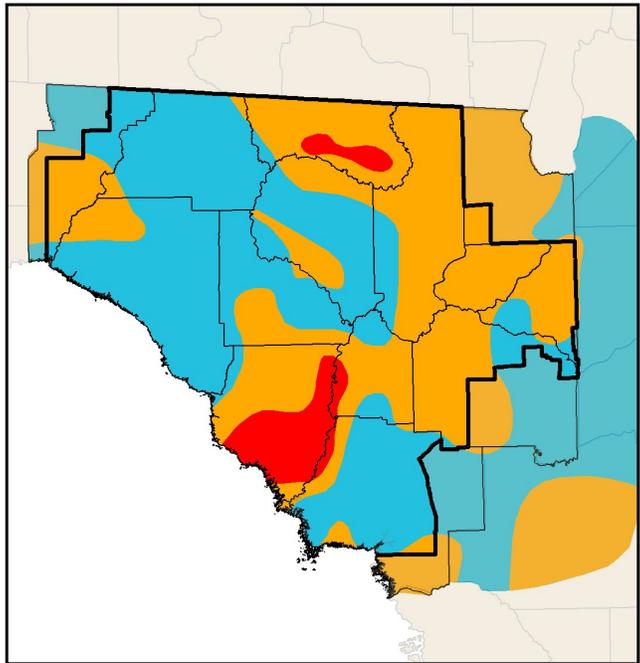
Data will be revised once approved and published by the U.S. Geological Survey.



**Figure 10:**  
January 2011  
Groundwater  
Conditions

Representation based on  
monthly statistics beginning 1976

Additional wells courtesy of SJRWMD and USGS

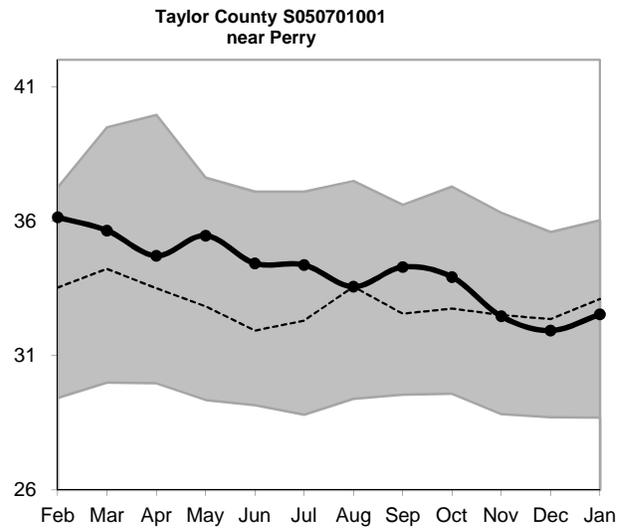
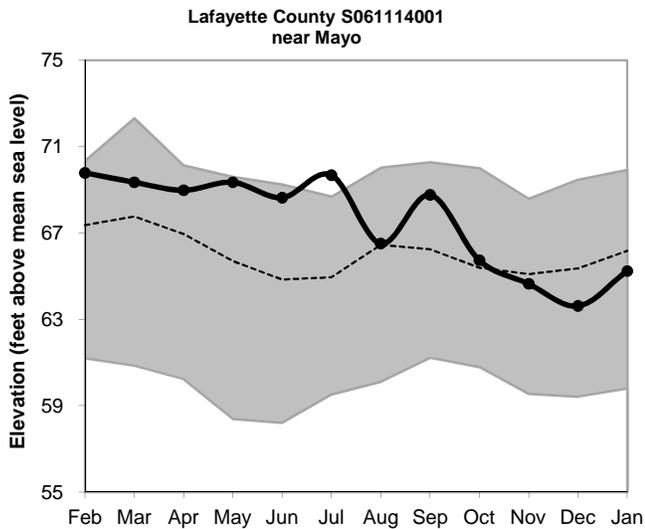
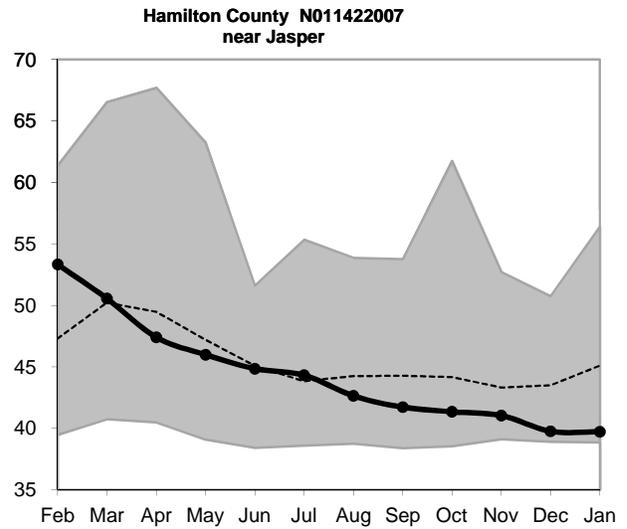
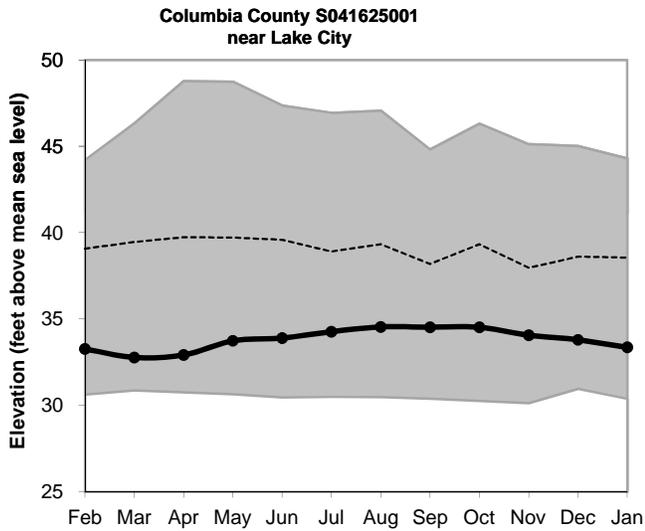
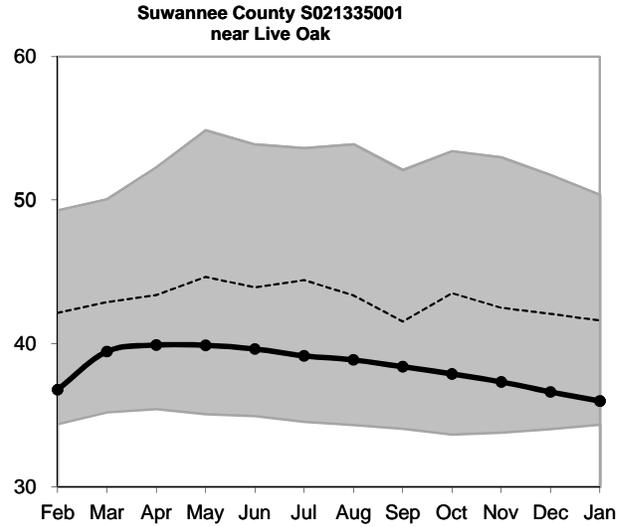
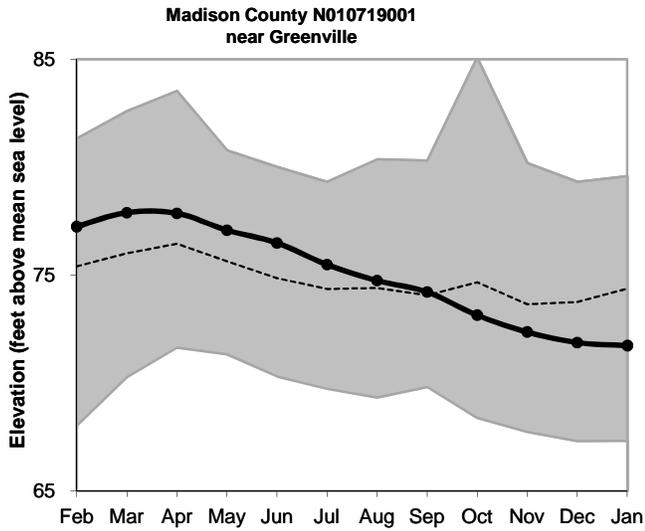
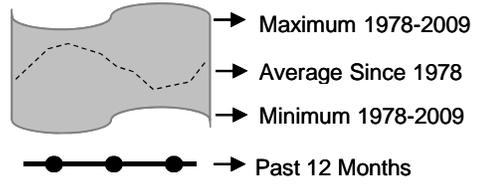


Inset: December 2010 Groundwater Levels

- 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
- District Boundary

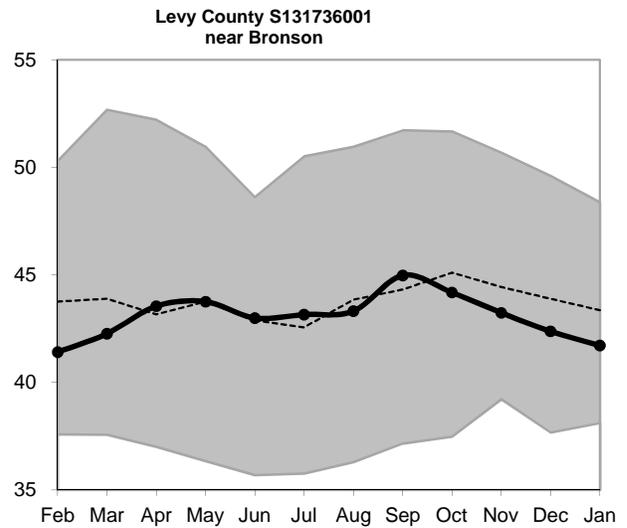
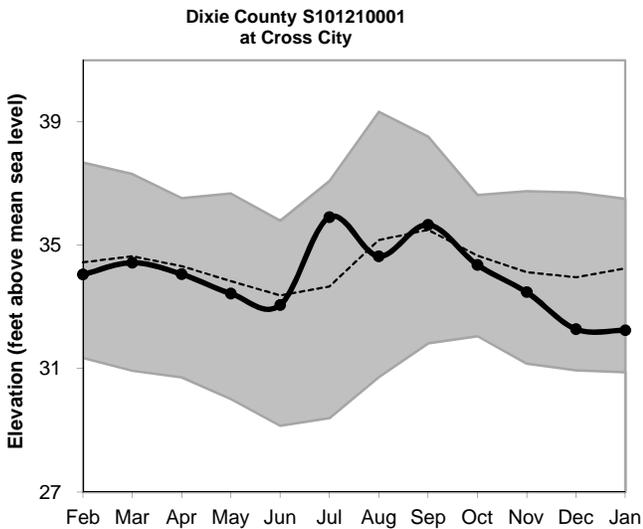
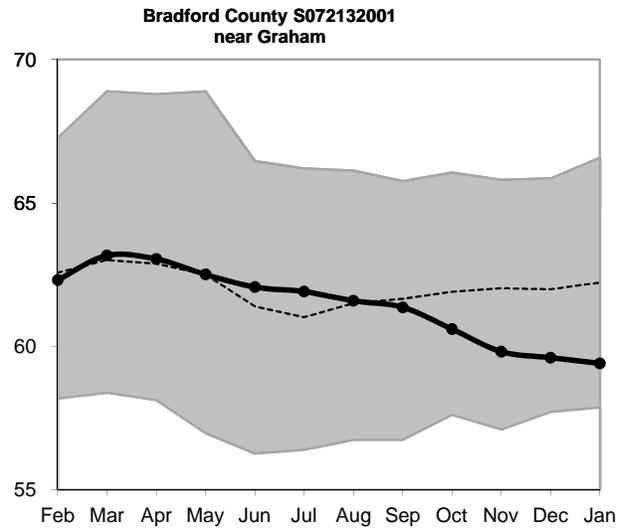
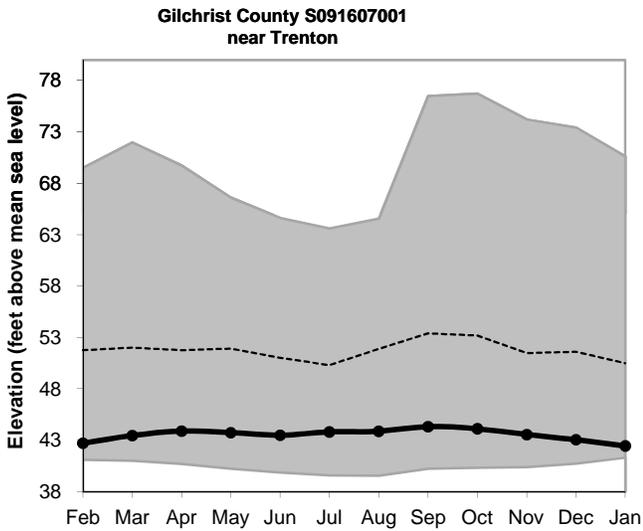
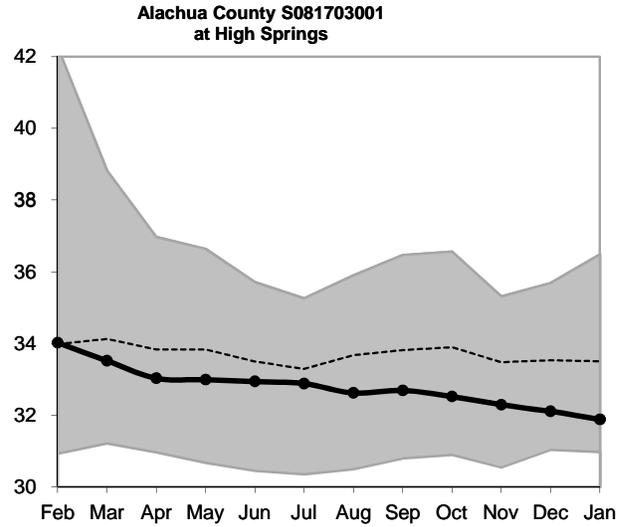
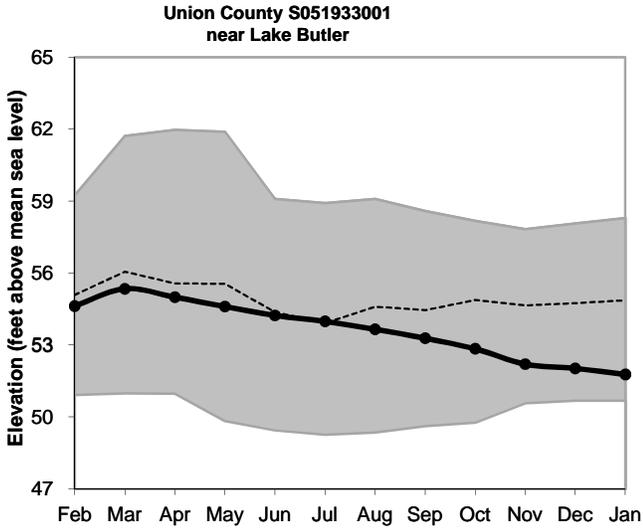
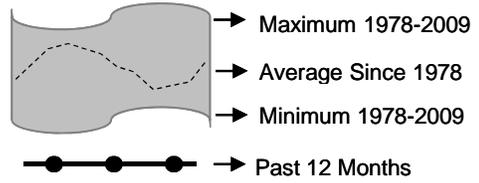
# Figure 11: Monthly Groundwater Level Statistics

Levels February 1, 2011 through January 31, 2011  
 Period of Record Beginning 1978



# Figure 11, cont.: Groundwater Level Statistics

Levels February 1, 2011 through January 31, 2011  
 Period of Record Beginning 1978

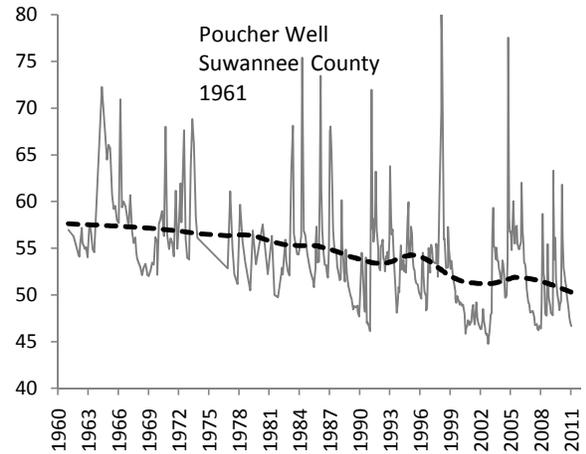
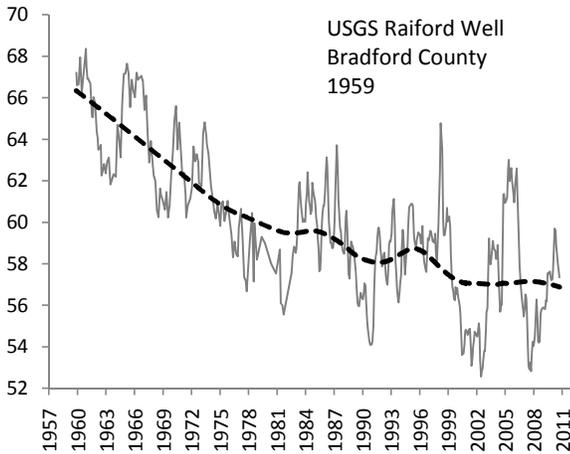
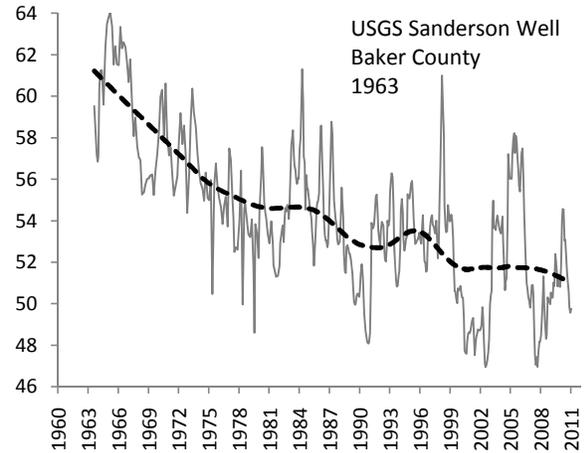
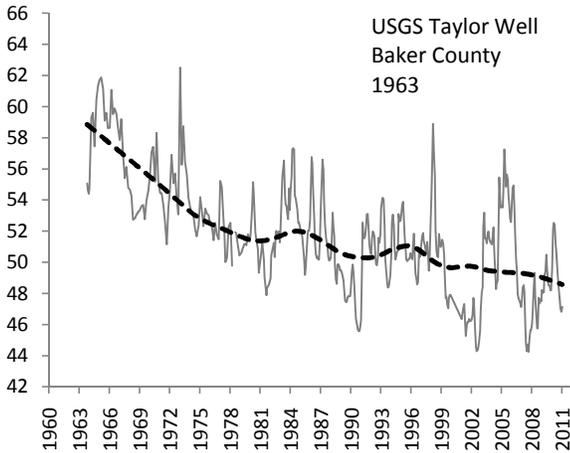
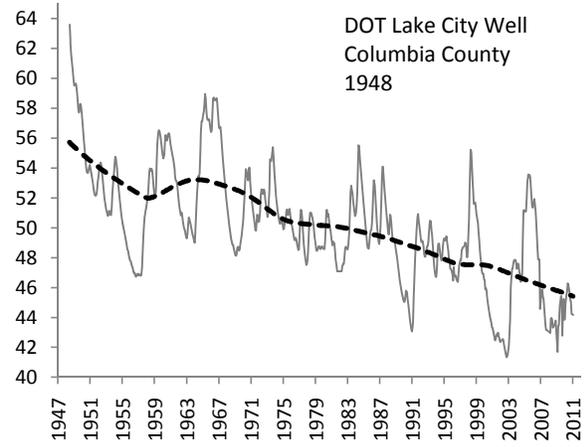
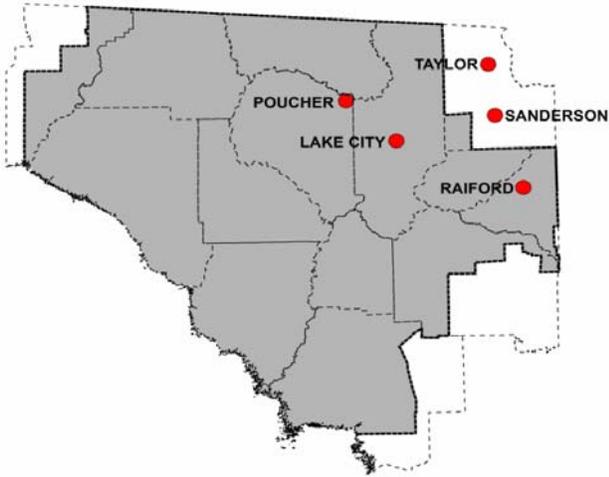


# Figure 12: Long-Term Groundwater Levels

Ending January 2011

Levels in feet above mean sea level

— Observed data  
 - - - Observed data smoothed using LOESS (locally weighted polynomial regression)



### Figure 13: Agricultural Water Use

Daily evapotranspiration (loss of water by evaporation and plant transpiration) and irrigation based on usage reported by up to 106 overhead irrigation systems (12,250 acres total) on a variety of crops throughout the District. These units are part of a network of 150 units installed at 42 agricultural operations by permission of the owners. Evapotranspiration data courtesy of University of Florida IFAS Extension.

