

## MEMORANDUM

TO: Governing Board

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

DATE: March 3, 2011

RE: February 2011 Hydrologic Conditions Report for the District

### RAINFALL

- Average rainfall in February was 3.85", just 0.02" short of the long-term February average (Table 1, Figure 1). Accumulations of up to 8" occurred in localized areas of Dixie, Levy, Gilchrist, and Alachua counties (Figure 2). Totals in Hamilton, Jefferson, Madison, and Taylor counties were below normal (Figure 3). Significant accumulations ended by February 10th, with only traces of rain recorded up to March 1. The highest 24-hour total was 3.71" at Manatee Springs, followed by 2.86" at the Forest Grove gage in Alachua County.
- The 12-month District average of 52.99" was near the long-term average of 54.68". However, the upper Aucilla, Santa Fe, and Suwannee basins had significant deficits of 10" to 20" (Figure 4). Figure 5 shows the change in annual deficits beginning in 1998.

### SURFACEWATER

- **Rivers:** The Econfina, Fenholloway, and Steinhatchee rivers had normal flows for February. Most gages on the Suwannee River and its tributaries improved to normal conditions then fell to below normal by the end of the month. The Suwannee River at Fargo, the first gage downstream of the Okefenokee Swamp headwaters, rose to its highest level since August, but still remained below the 10<sup>th</sup> percentile of February flows. The Santa Fe River near Fort White also rose to its highest level since August, but remained below normal throughout the month. 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 most monitored lakes improved in February with an average rise of 0.4 feet. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for six lakes.
- **Springs:** Average February flow relative to historical flows is shown for five spring systems in Figure 9.

## GROUNDWATER

Levels improved in 79% of monitored upper Floridan Aquifer wells, rising by an average of 0.7 feet (Figure 10). Conditions averaged across the District using monthly statistics rose to the 30<sup>th</sup> percentile from the 26<sup>th</sup> percentile in January (based on records beginning no earlier than 1976). Conditions based on the entire period of record rose to the 34<sup>th</sup> percentile. Average conditions in the Suwannee and Santa Fe basins improved slightly but remained below the 25<sup>th</sup> percentile of all observations. Statistics for a representative sample of wells are shown in Figure 11, and 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

- The District monitors agricultural water use on 106 overhead irrigation systems. The average daily application rate in February was 0.02". Figure 13 shows average daily 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 near normal conditions during the last week of February.
- The U.S. Geological Survey categorized the Suwannee River and its tributaries 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 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), 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/bmp

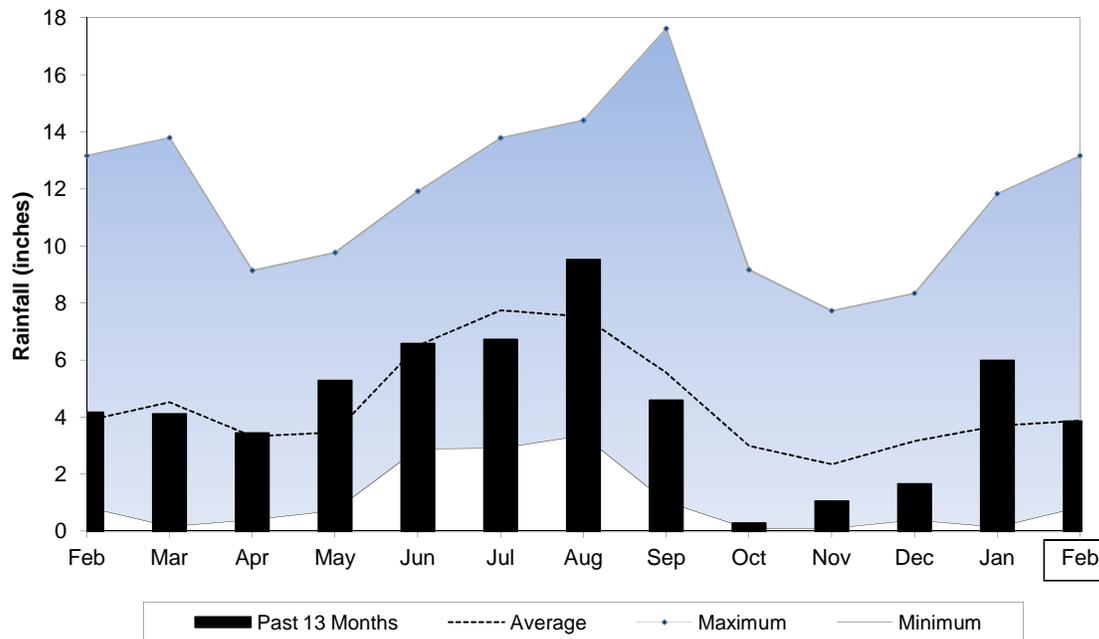
**Table 1: Estimated Rainfall Totals**

County	Feb-2011	Feb Average	Last 3 Months	Last 12 Months
Alachua	5.17	3.59	10.73	45.86
Baker	4.30	3.44	11.65	45.65
Bradford	4.54	3.64	9.66	39.02
Columbia	4.00	3.72	11.55	48.14
Dixie	5.04	3.98	13.05	65.61
Gilchrist	4.89	4.18	11.94	50.89
Hamilton	2.74	4.01	10.71	46.78
Jefferson	2.78	4.65	10.02	46.93
Lafayette	3.84	3.98	12.60	56.14
Levy	4.27	3.63	10.93	64.71
Madison	2.82	4.36	10.57	49.05
Suwannee	3.63	3.73	12.37	51.85
Taylor	3.03	3.94	12.00	56.53
Union	4.49	3.63	10.76	46.36

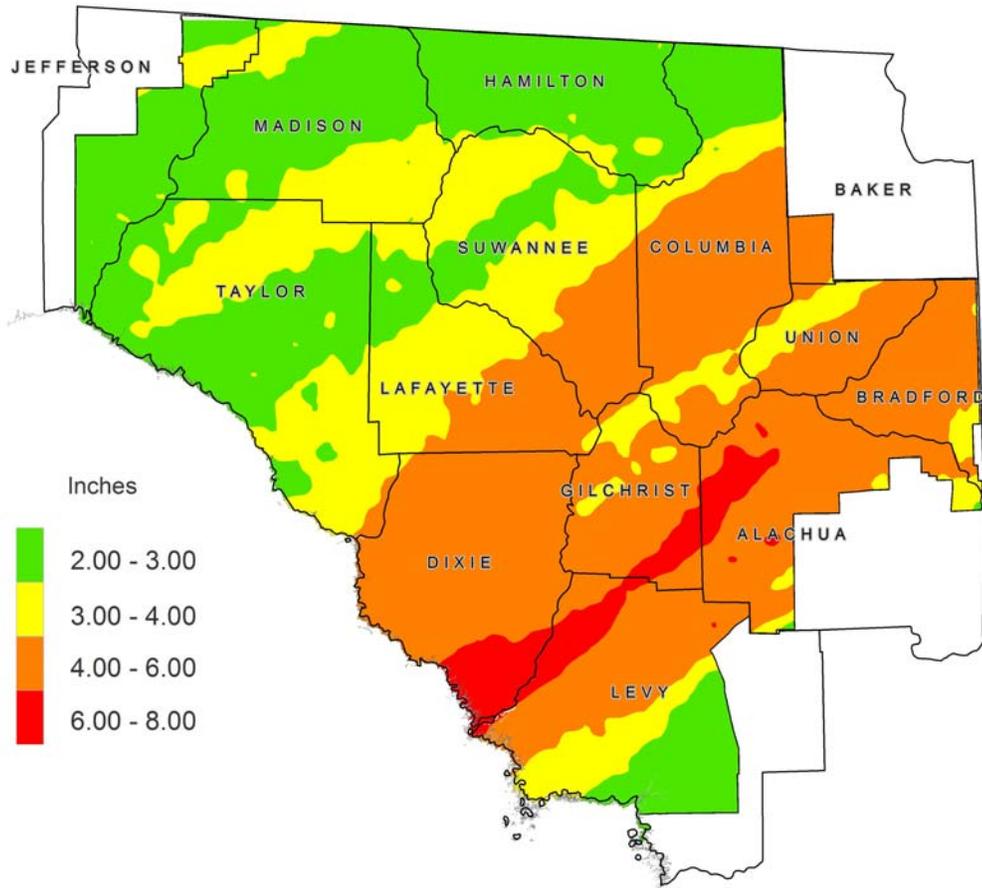
February 2011 Average: 3.85  
 Historical February Average (since 1932): 3.87  
 Historical 12-month Average (since 1932): 54.68  
 Past 12-Month Total: 52.99  
 12-month Rainfall Deficit: -1.69

(Rainfall reported in inches)

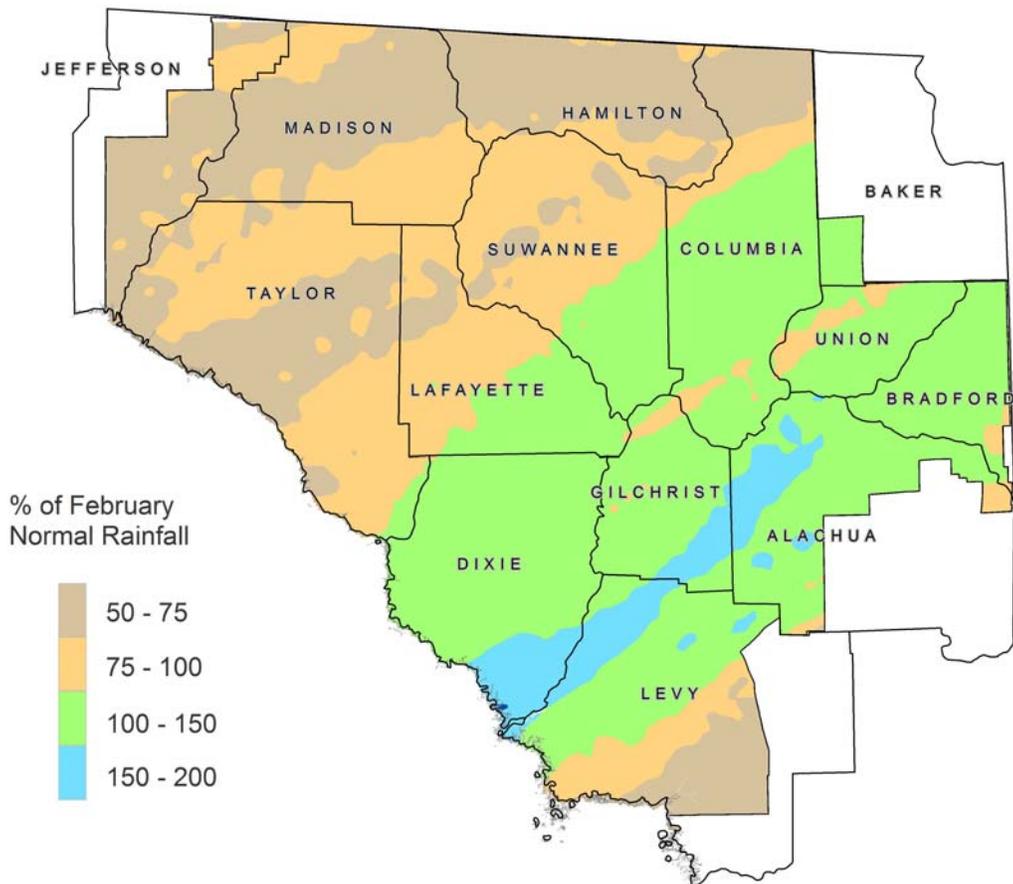
**Figure 1: Comparison of District Monthly Rainfall**



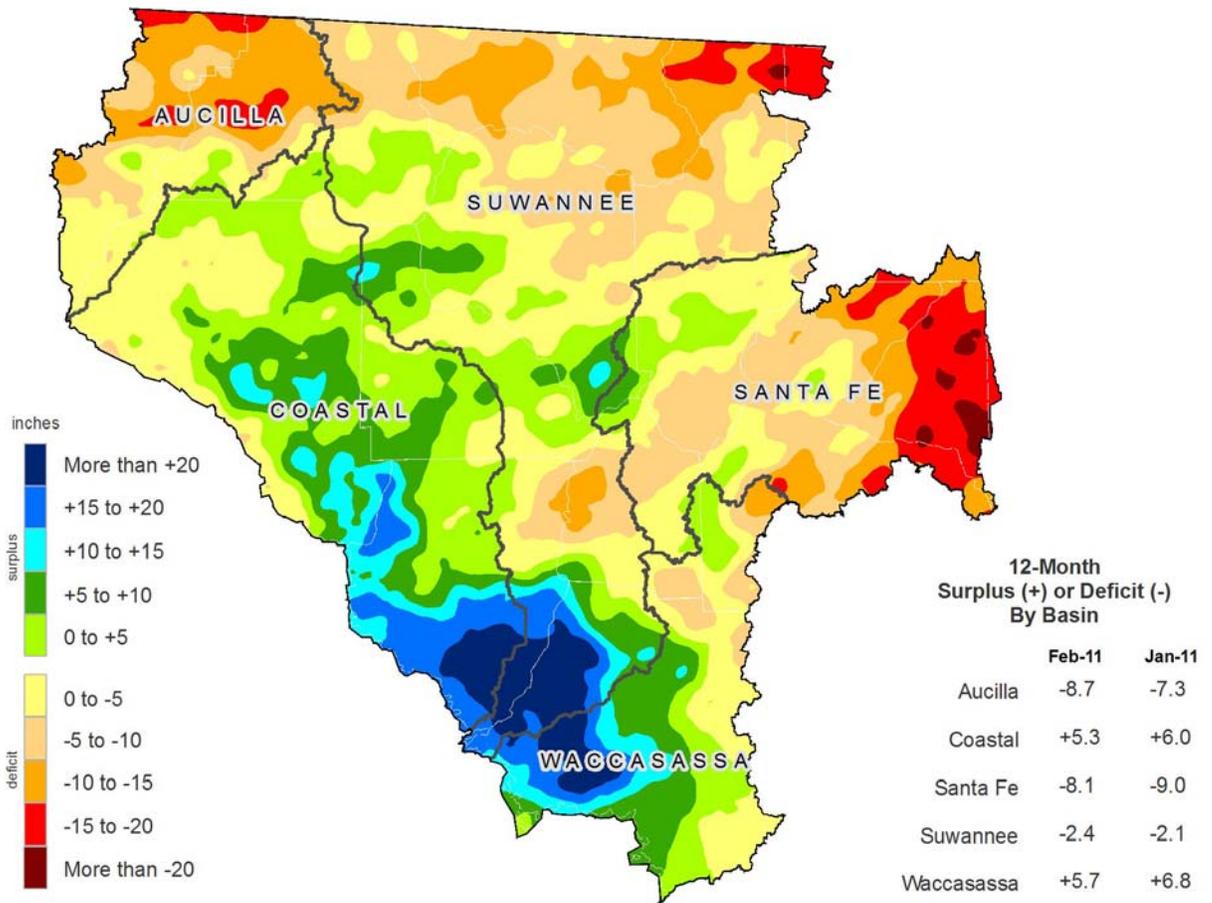
**Figure 2: February 2011 Rainfall Estimate**



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

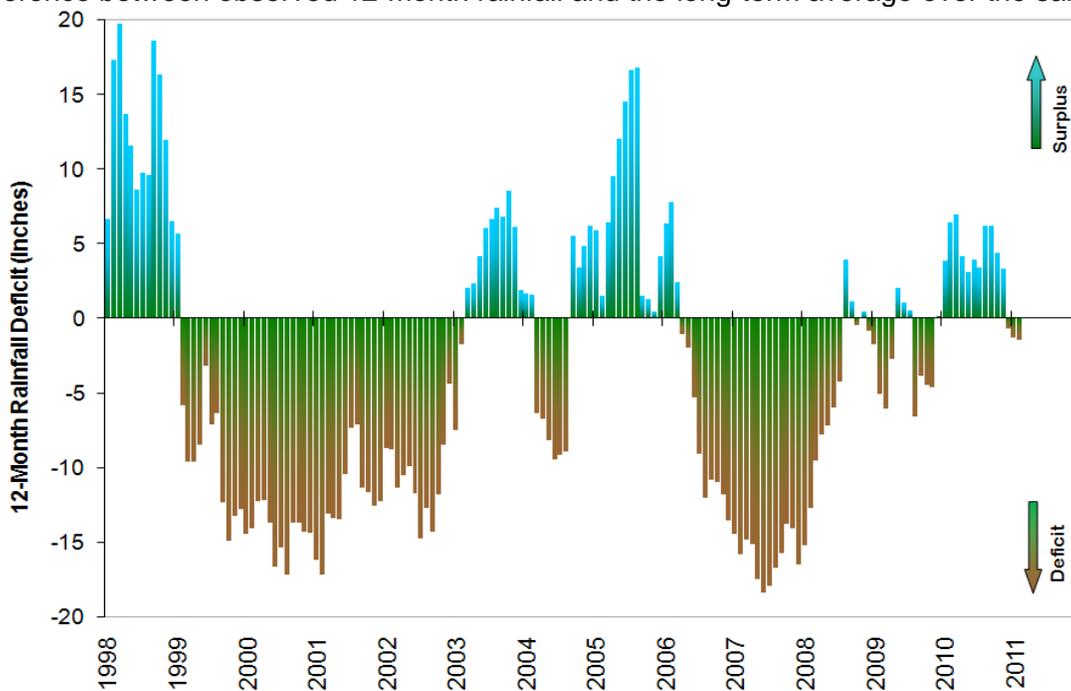


**Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin Ending February 2011**



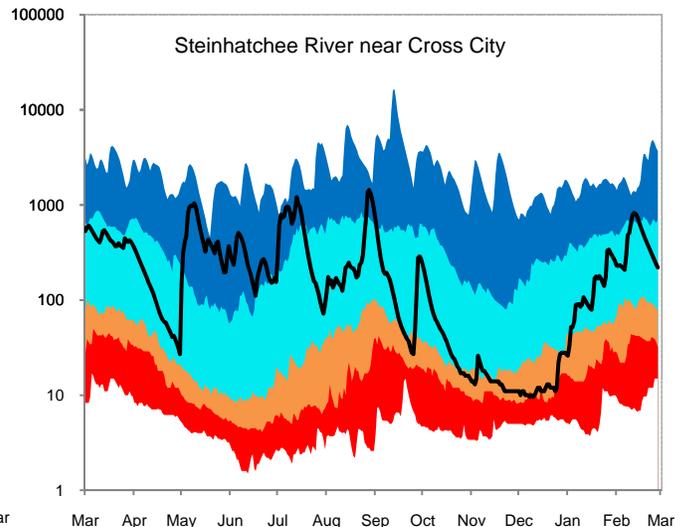
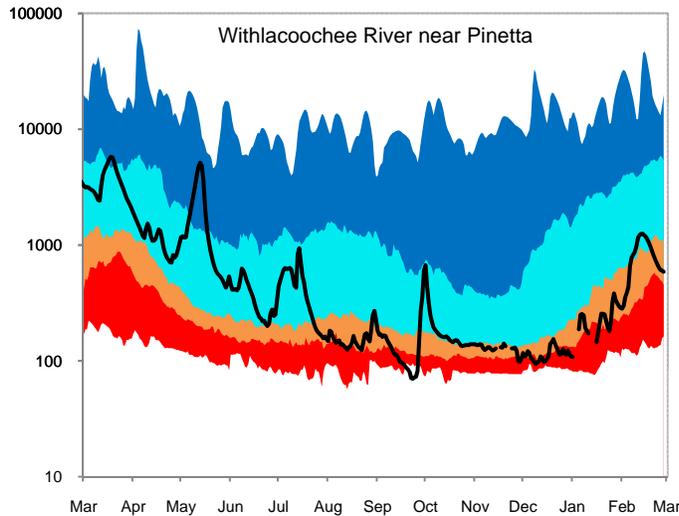
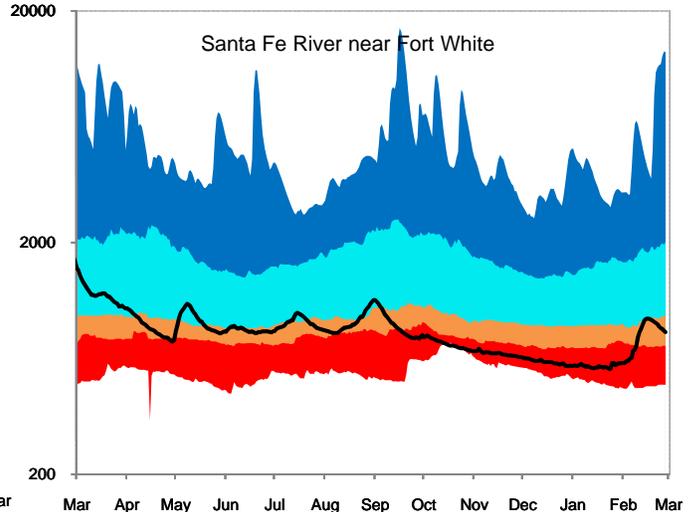
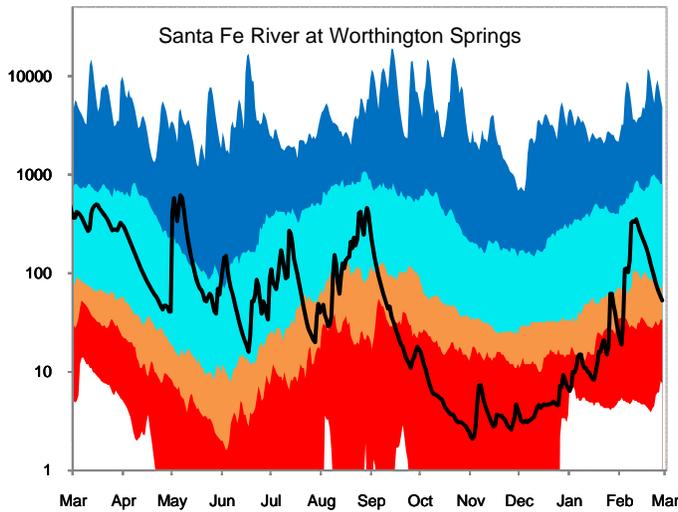
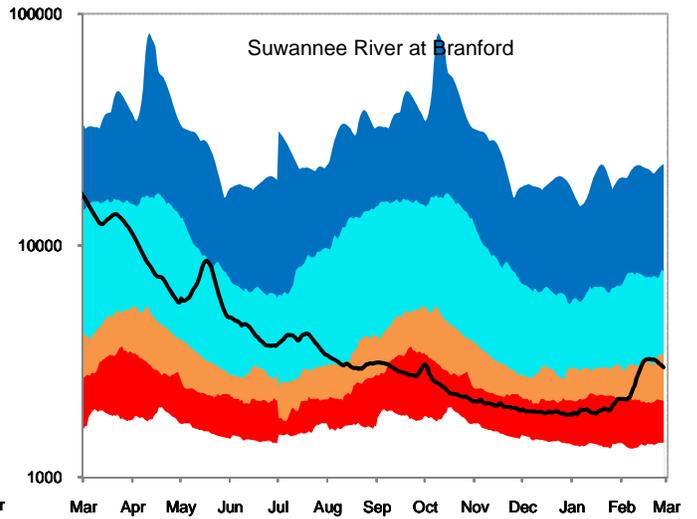
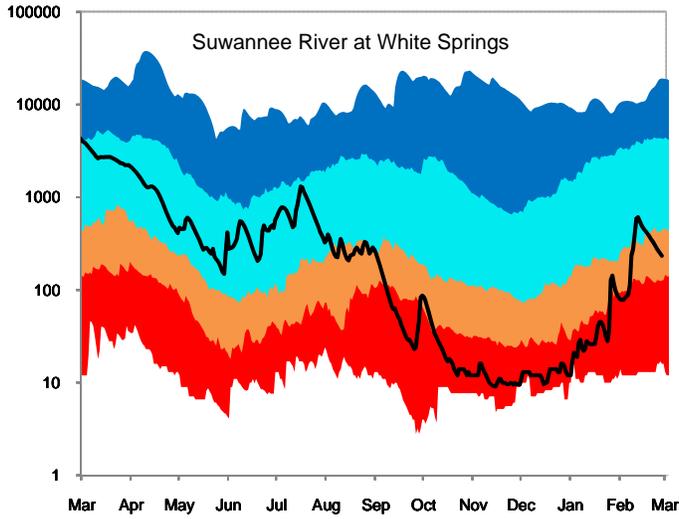
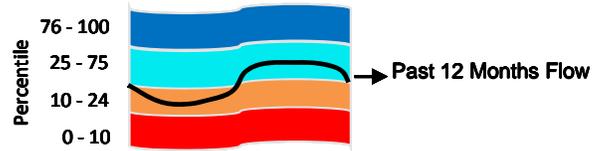
**Figure 5: 12-Month Rolling Rainfall Deficit Since 1998**

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



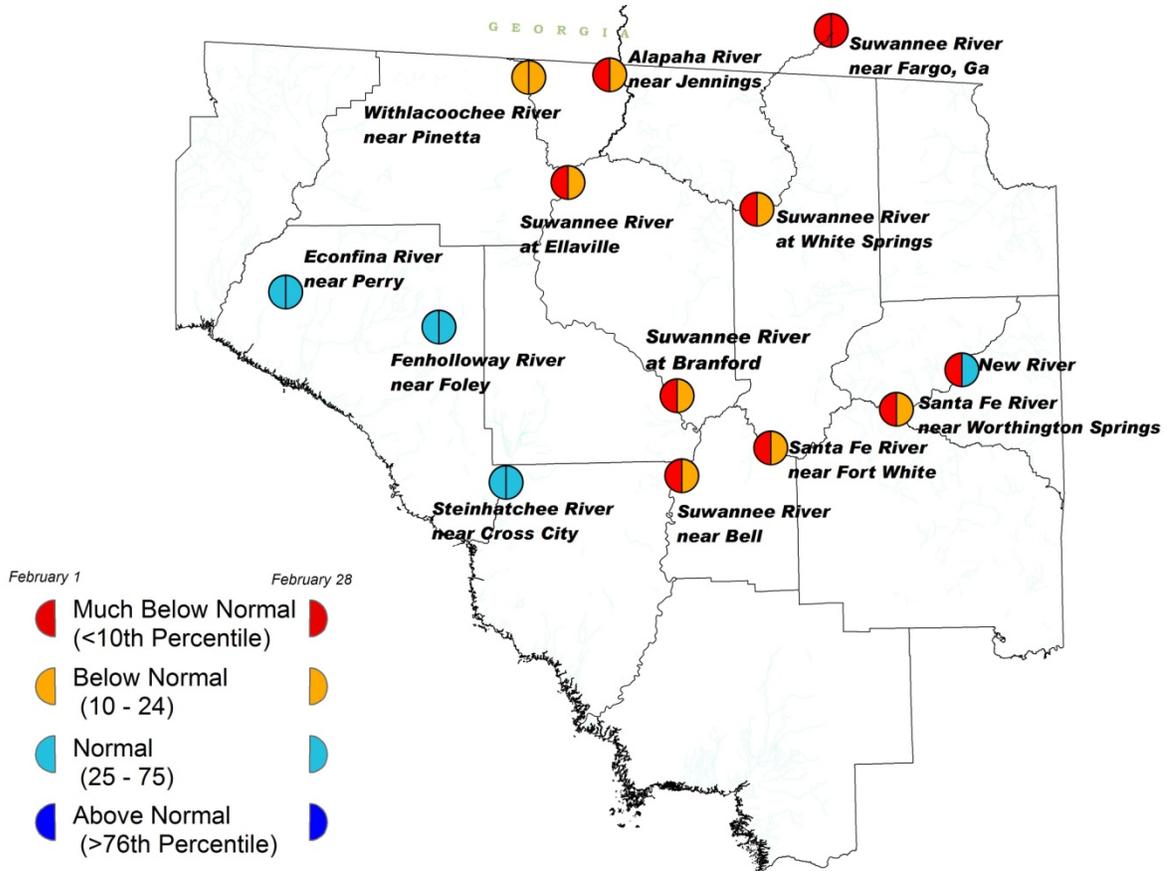
# Figure 6: Daily River Flow Statistics

March 1, 2010 through February 28, 2011

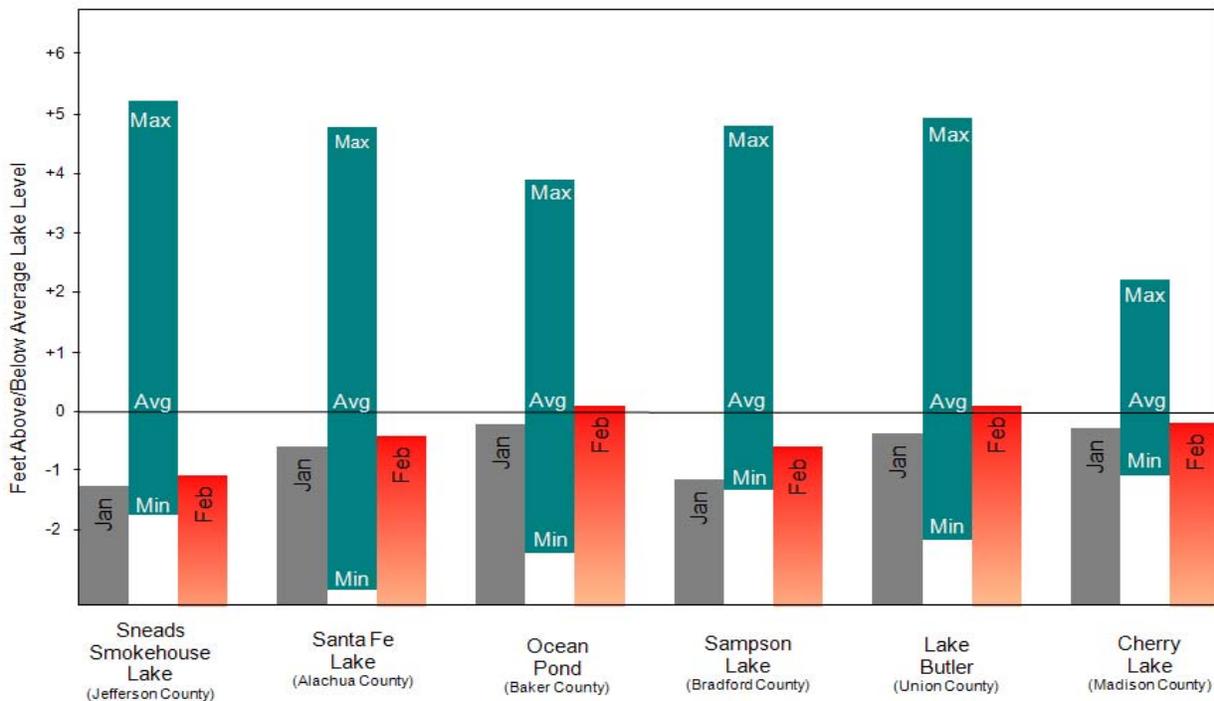


RIVER FLOW, CUBIC FEET PER SECOND

**Figure 7: February 2011 Streamflow Conditions**



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

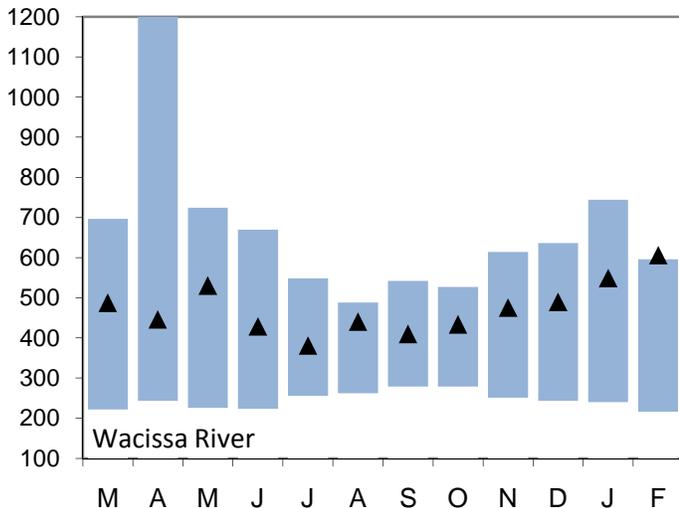
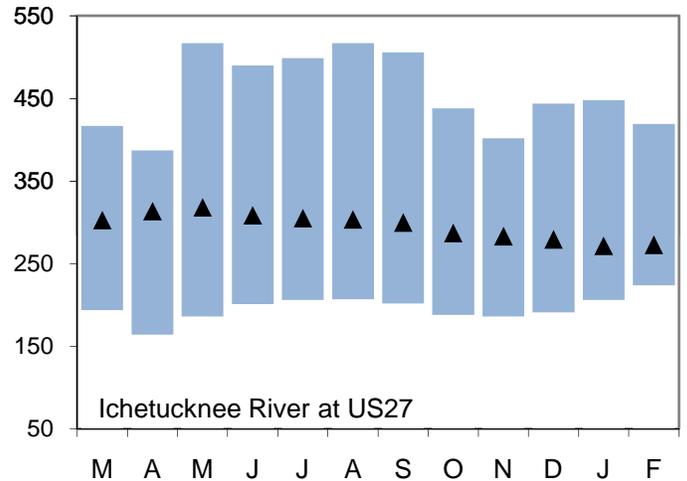
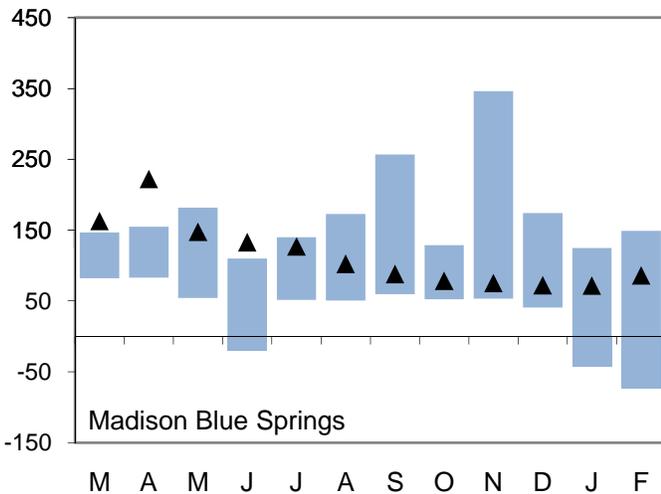
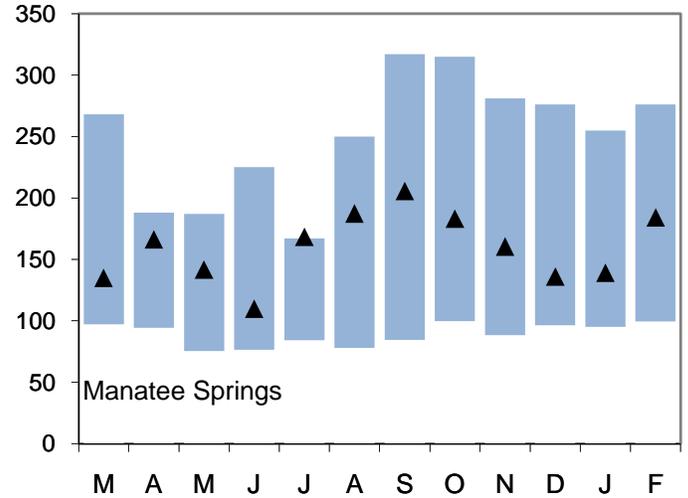
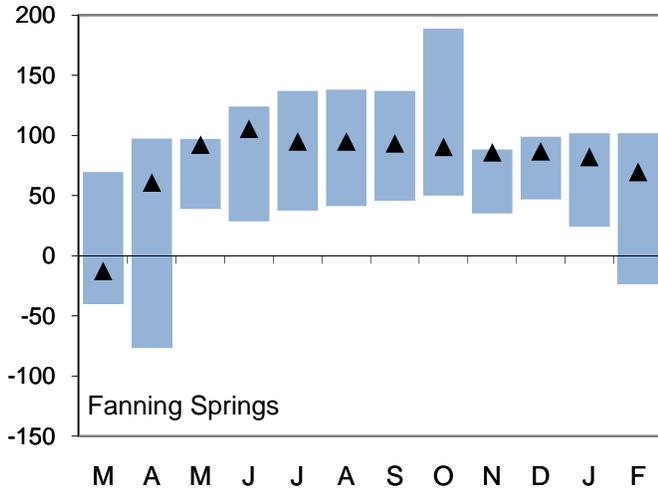
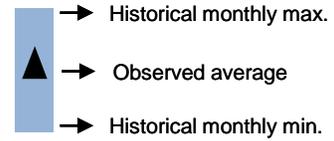


### Figure 9: Monthly Springflow Statistics

Flows March 1, 2010 through February 28, 2011

Springflow data are given in cubic feet per second.

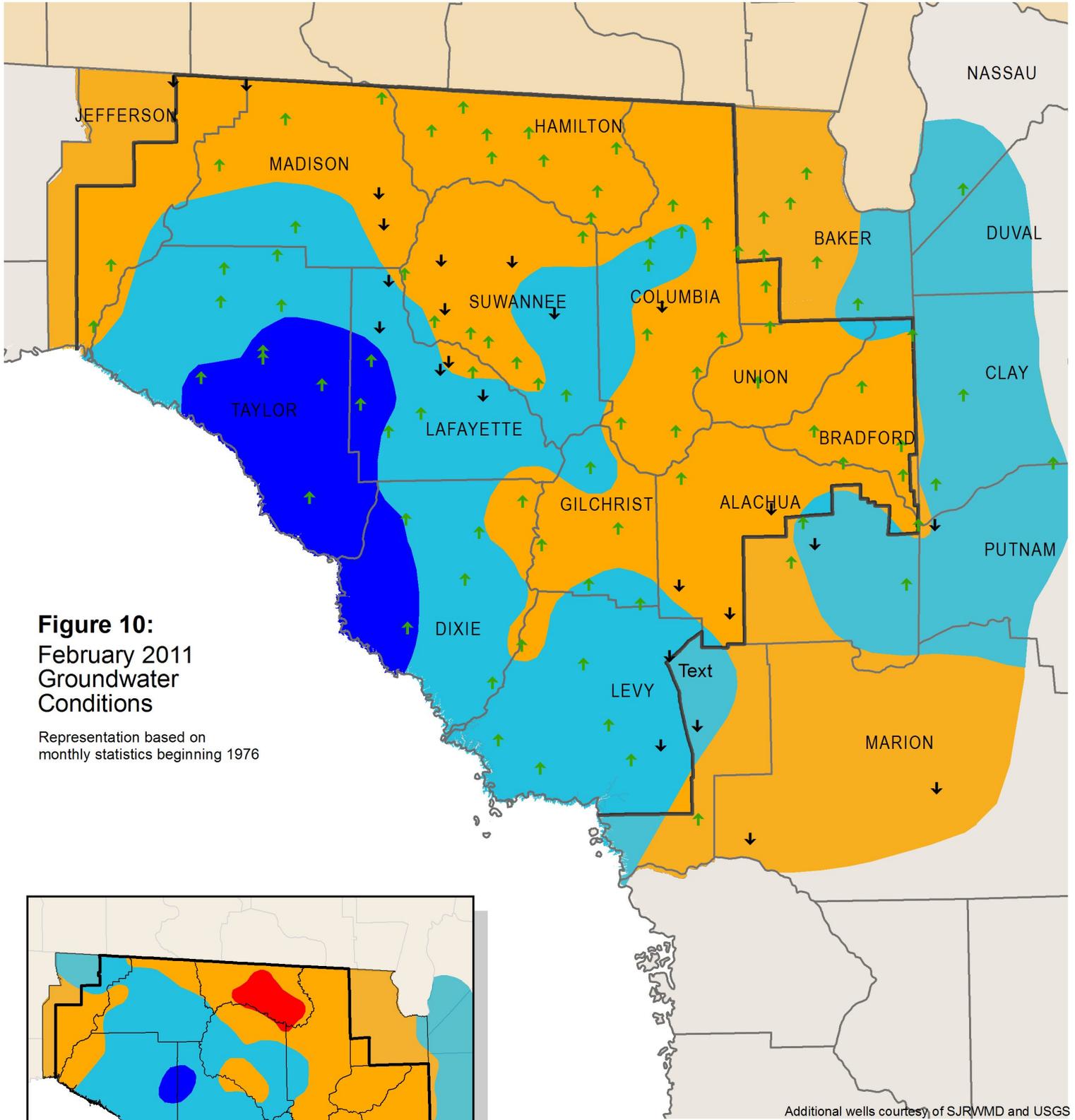
Period of record beginning 2002. Data are provisional.



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.

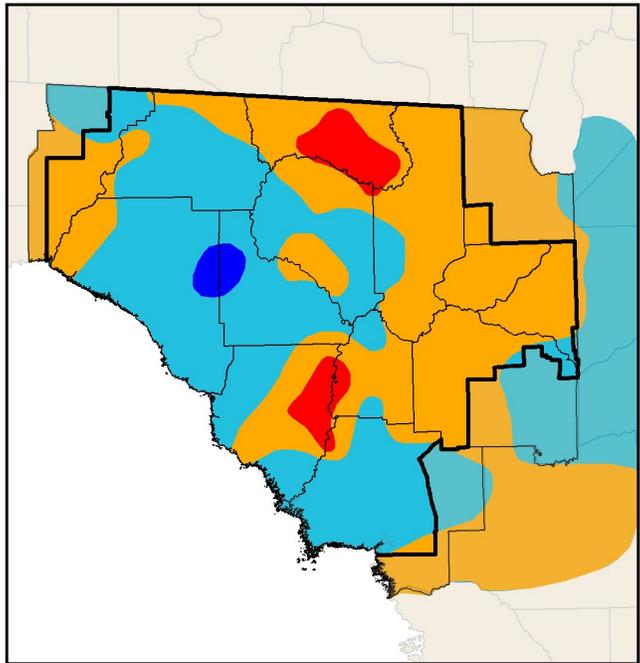
Data will be revised once approved and published by the U.S. Geological Survey.



**Figure 10:**  
February 2011  
Groundwater  
Conditions

Representation based on  
monthly statistics beginning 1976

Additional wells courtesy of SJRWMD and USGS

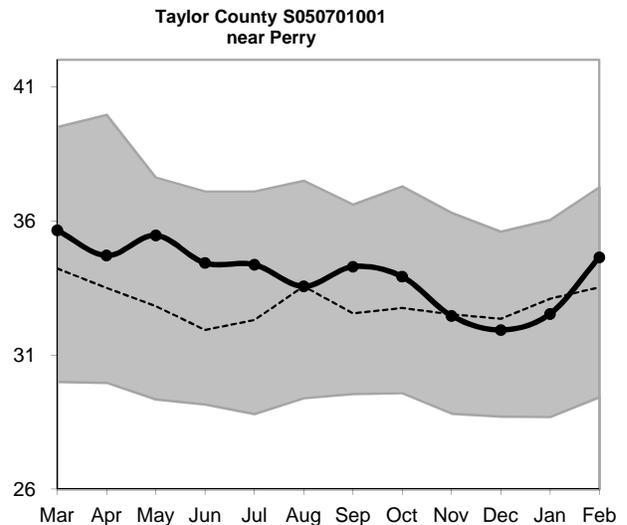
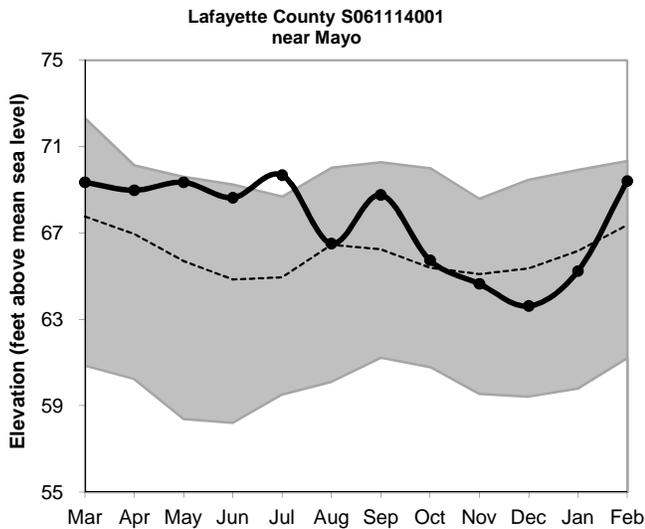
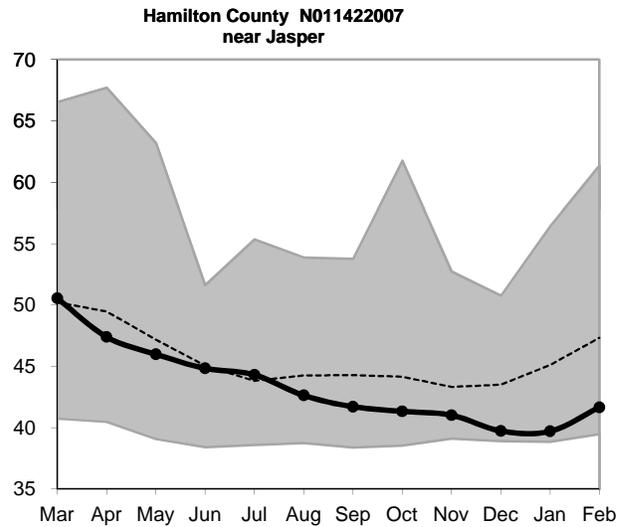
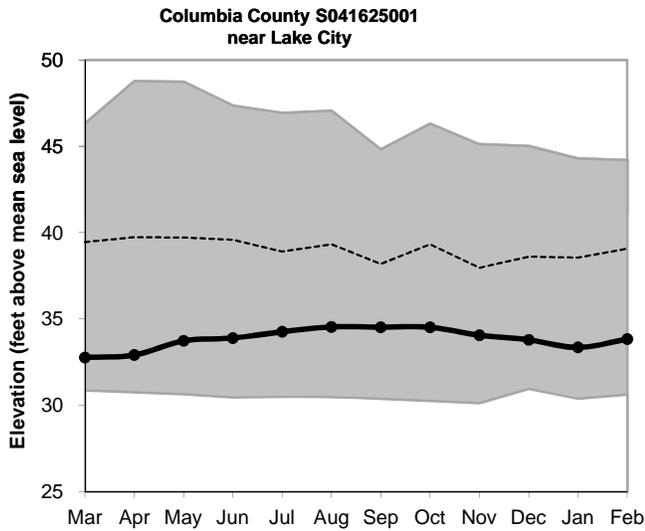
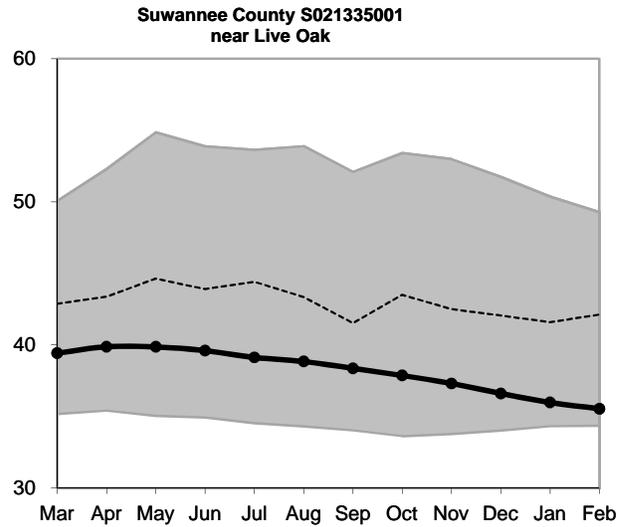
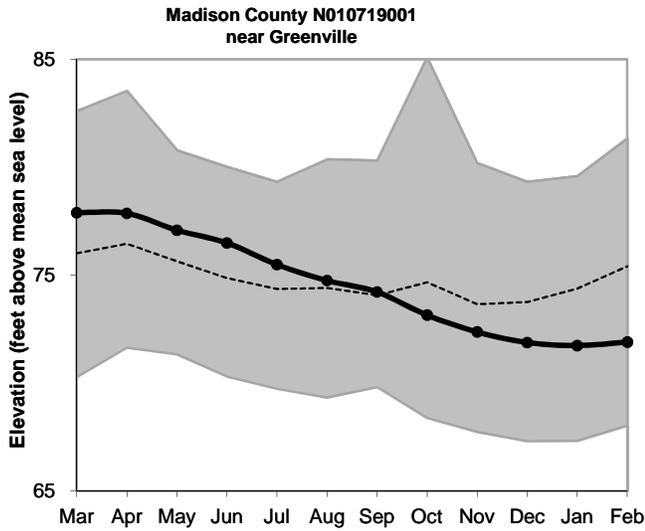
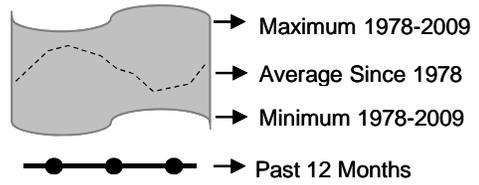


Inset: January 2011 Groundwater Levels

- 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

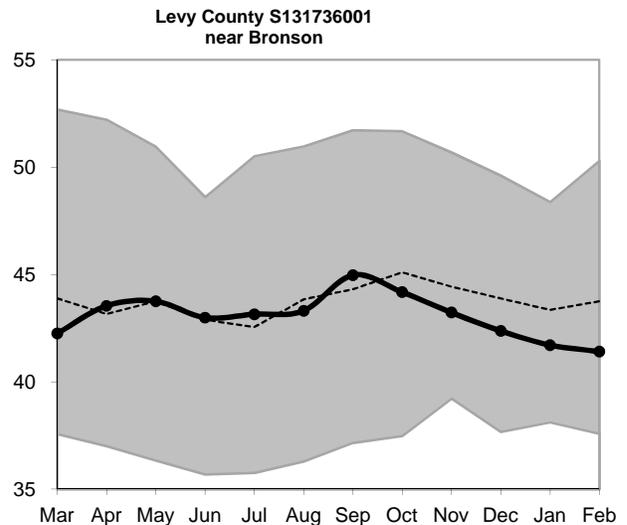
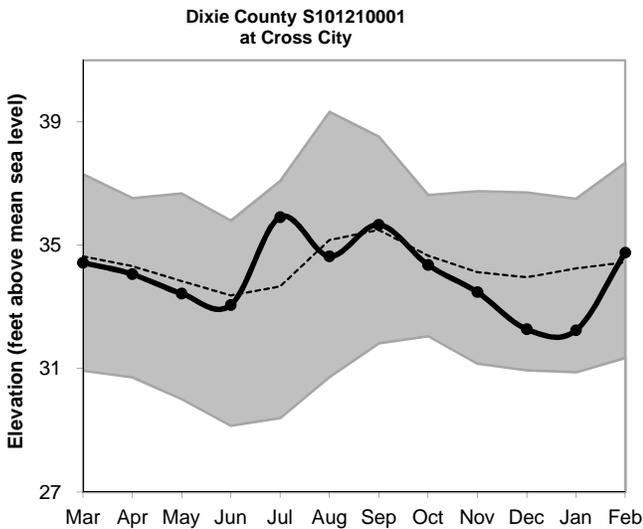
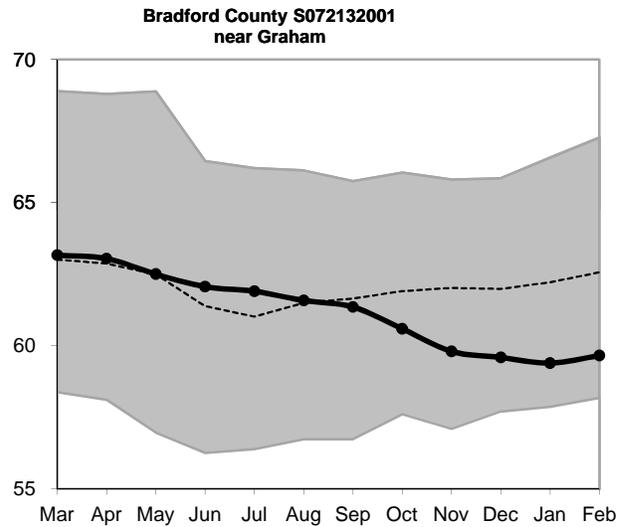
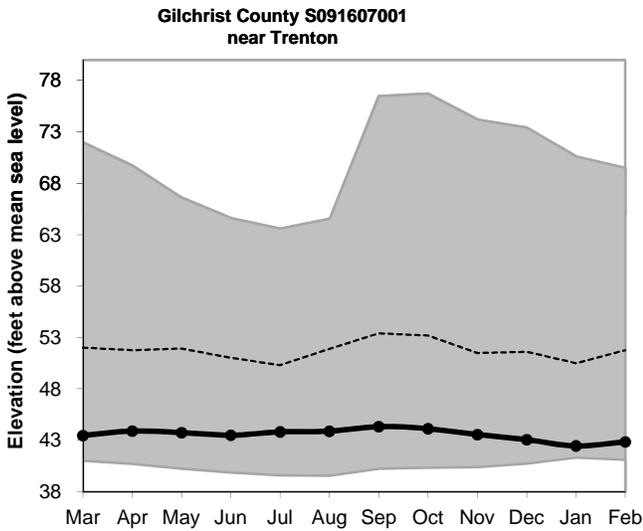
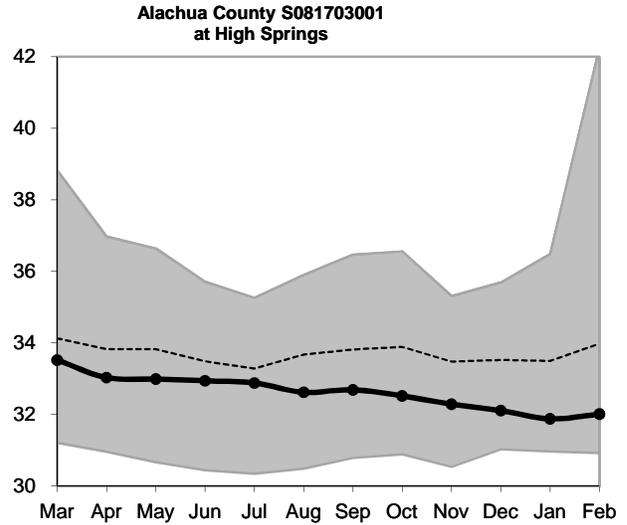
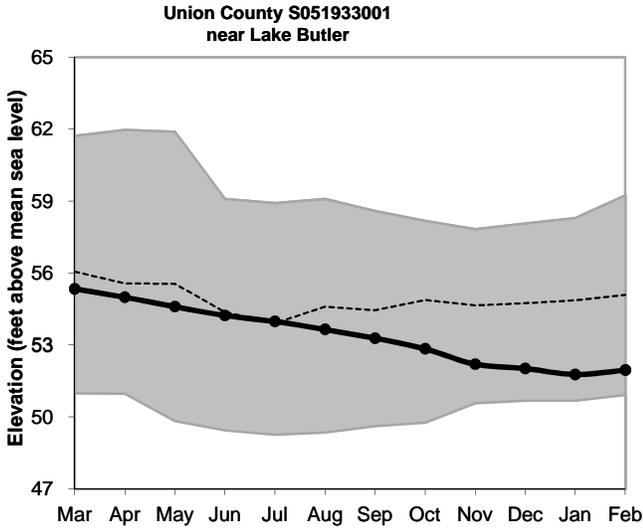
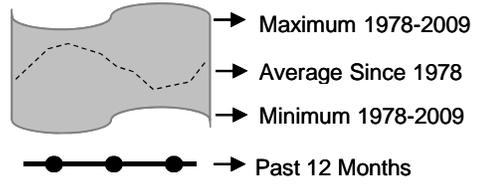
# Figure 11: Monthly Groundwater Level Statistics

Levels March 1, 2010 through February 28, 2011  
 Period of Record Beginning 1978



# Figure 11, cont.: Groundwater Level Statistics

Levels March 1, 2010 through February 28, 2011  
 Period of Record Beginning 1978

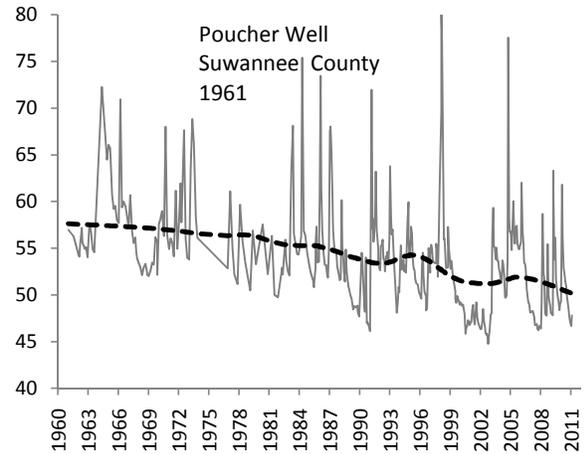
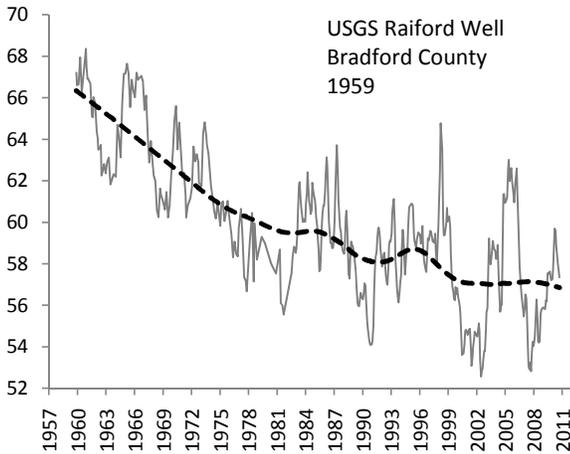
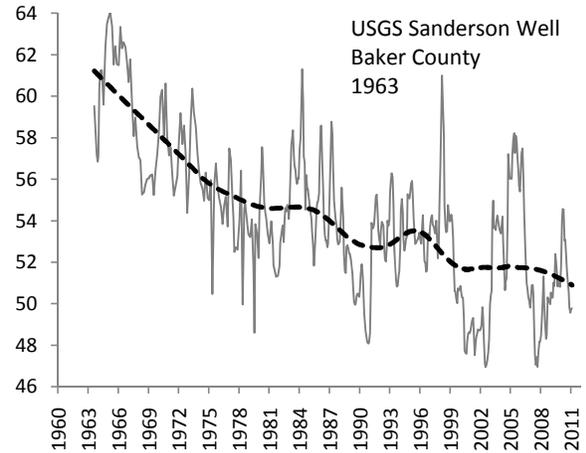
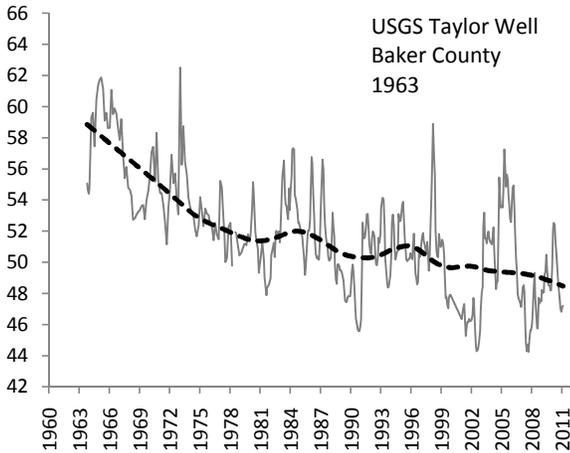
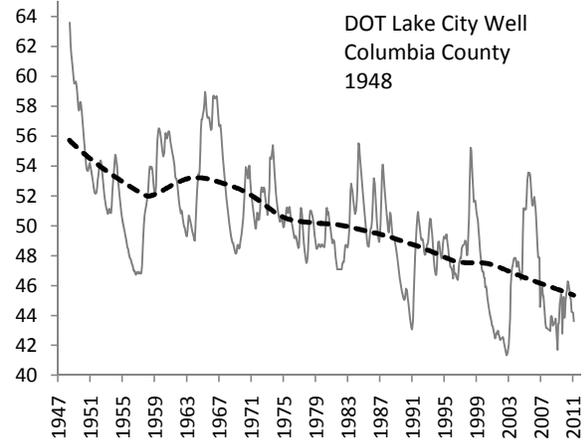
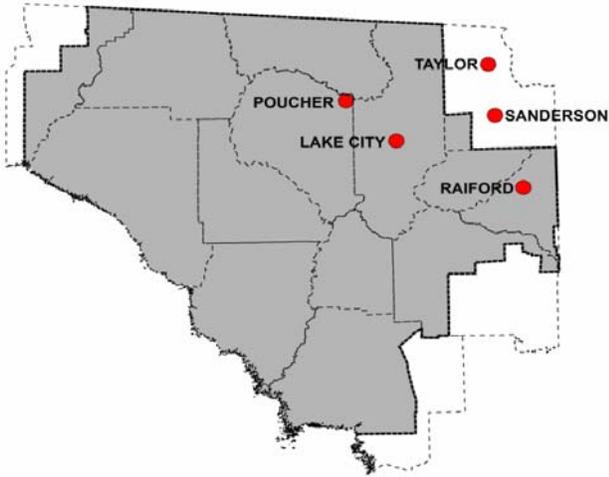


# Figure 12: Long-Term Groundwater Levels

Ending February 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 154 units installed at 42 agricultural operations by permission of the owners. Evapotranspiration data courtesy of University of Florida IFAS Extension.

