

MEMORANDUM

TO: Governing Board

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

THRU: David Still, Executive Director *DS*
Jon Dinges, Department Director

DATE: April 6, 2011

RE: March 2011 Hydrologic Conditions Report for the District

RAINFALL

- Average rainfall in March was 5.10", which is 0.58" more than the long-term average of 4.52" (Table 1, Figure 1). Accumulations were poorly distributed with western counties seeing almost double normal rainfall while counties in the Santa Fe Basin had significantly low totals (Figure 3). The highest 24-hour total was 2.77" at Cabbage Grove Tower in Taylor County. Virtually no rainfall was recorded during the second and third week of March.
- The 12-month District average of 54.00" was near the long-term average of 54.68". Significant deficits persisted in the upper Aucilla, Suwannee, and Santa Fe Basins (Figure 4). Figure 5 shows the change in annual deficits beginning in 1998.

SURFACEWATER

- **Rivers:** River levels fell throughout the District, but a few gages saw modest rises near the end of the month. All gages on the Suwannee River and its tributaries ended the month with flows below the 25th percentile of March records. Rivers in coastal basins (the Econfinia, Fenholloway, and Steinhatchee) fared better, with flows staying in a range considered typical of the season. 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 dropped slightly in March. The notable exception was Snead's Smokehouse Lake, in Jefferson County, which rose over a foot. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for six lakes.
- **Springs:** Average March flow relative to historical flows is shown for five spring systems in Figure 9.

GROUNDWATER

Levels fell in 40% of monitored upper Floridan Aquifer wells, dropping by an average of 2 inches since February (Figure 10). Conditions averaged across the District using monthly statistics fell to the 25th percentile from the 30th percentile in February (based on records beginning no earlier than 1978). Conditions based on the entire period of record remained near the 35th percentile. Average conditions in the Suwannee and Santa Fe Basins remained below the 30th percentile of all observations and the 25th percentile of monthly 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 March was 0.05", an increase of 0.02" since February. 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 mild drought during the last week of March.
- The U.S. Geological Survey categorized the Santa Fe and upper Suwannee River and its tributaries as below normal, and the middle and lower Suwannee River as experiencing moderate hydrologic drought.

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 two days per week between March and October, 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.

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/dd

Table 1: Estimated Rainfall Totals

County	Mar-2011	Mar Average	Last 3 Months	Last 12 Months
Alachua	3.03	4.21	10.59	45.42
Baker	3.22	4.36	11.25	45.53
Bradford	2.60	4.29	9.60	38.39
Columbia	3.71	4.62	11.45	48.88
Dixie	5.09	4.79	13.06	66.68
Gilchrist	3.38	4.84	11.91	51.07
Hamilton	4.66	5.17	10.90	47.83
Jefferson	7.19	5.80	10.07	48.94
Lafayette	5.30	5.03	12.57	57.81
Levy	4.76	5.03	11.00	63.30
Madison	6.81	5.72	10.66	51.01
Suwannee	5.69	5.17	12.29	53.85
Taylor	7.34	5.34	12.04	59.29
Union	2.38	4.85	10.81	45.92

March 2011 Average: 5.10
 Historical March Average (since 1932): 4.52
 Historical 12-month Average (since 1932): 54.68
 Past 12-Month Total: 54.00
 12-month Rainfall Deficit: -0.68

(Rainfall reported in inches)

Figure 1: Comparison of District Monthly Rainfall

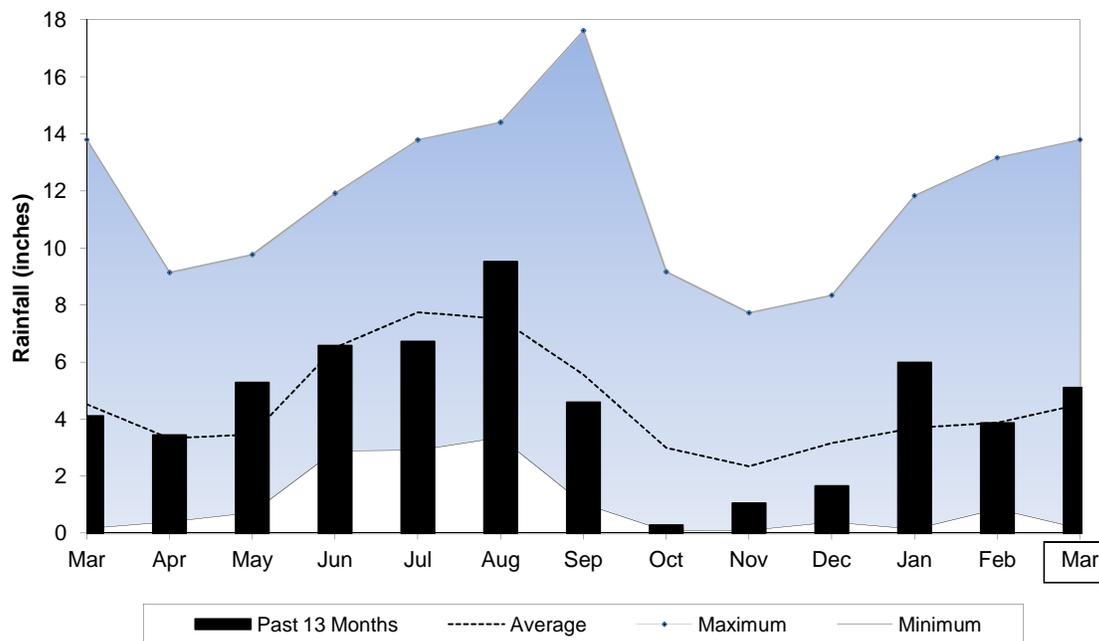


Figure 2: March 2011 Rainfall Estimate

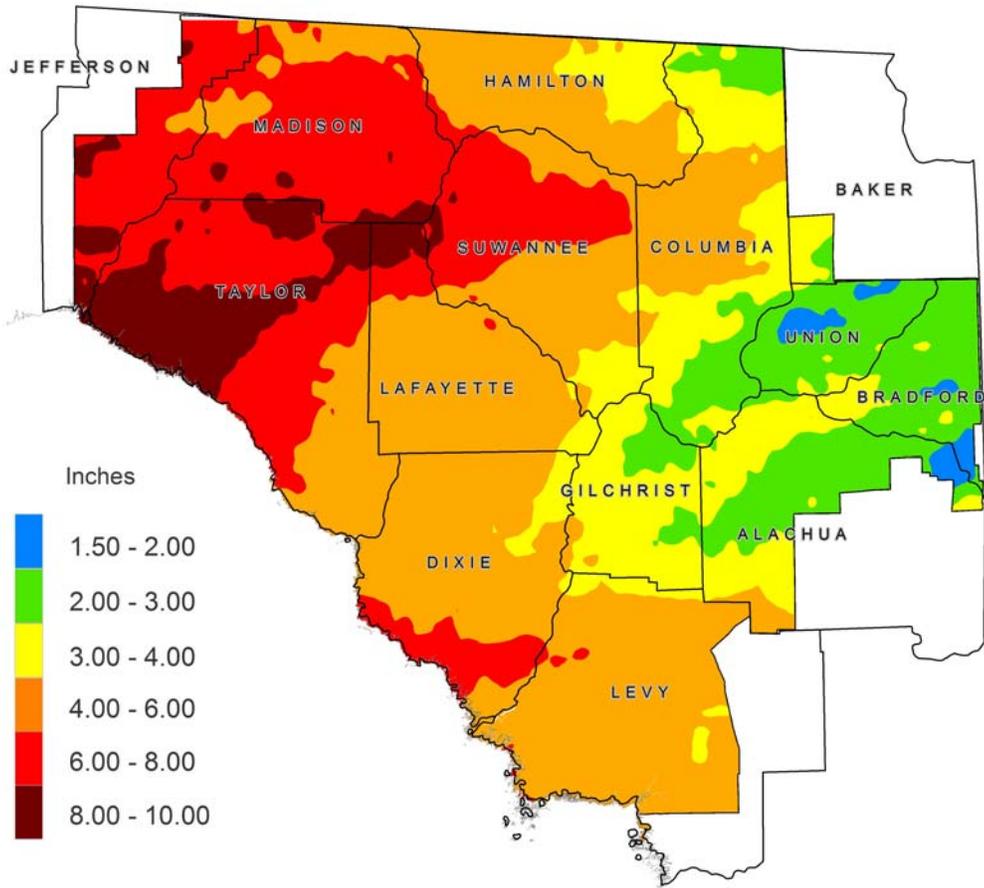


Figure 3: March 2011 Percent of Normal Rainfall

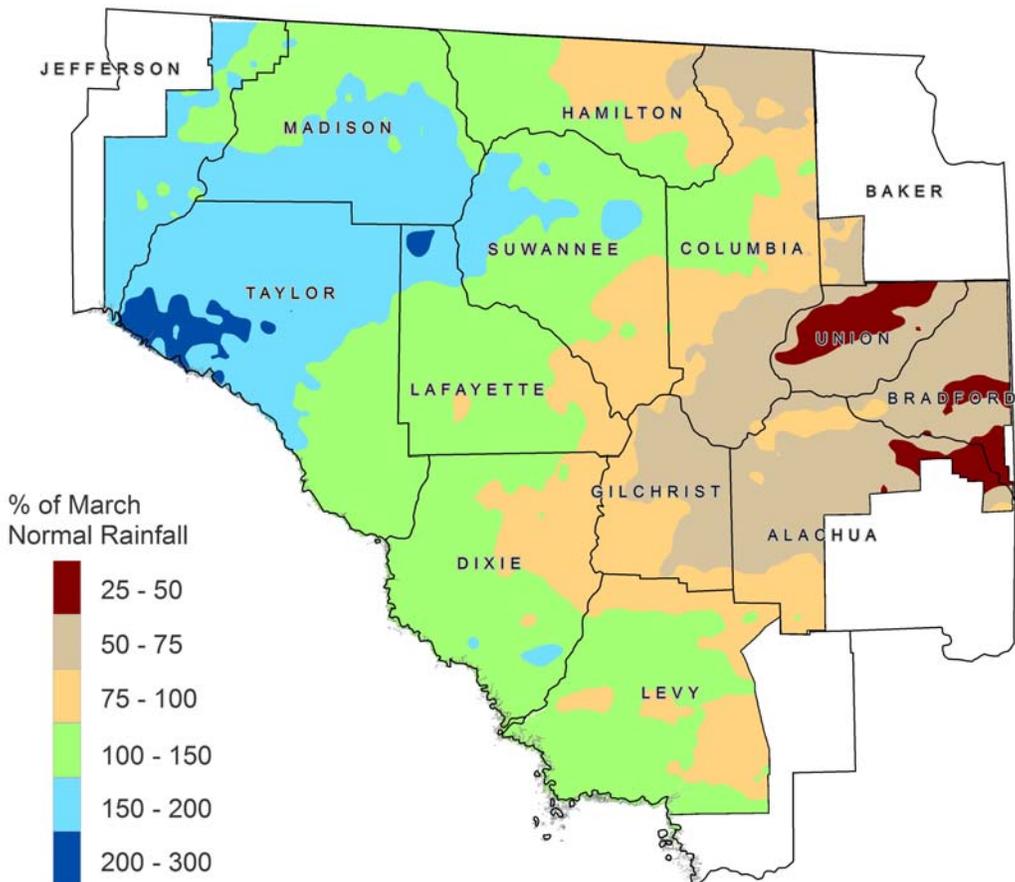


Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin Ending March 2011

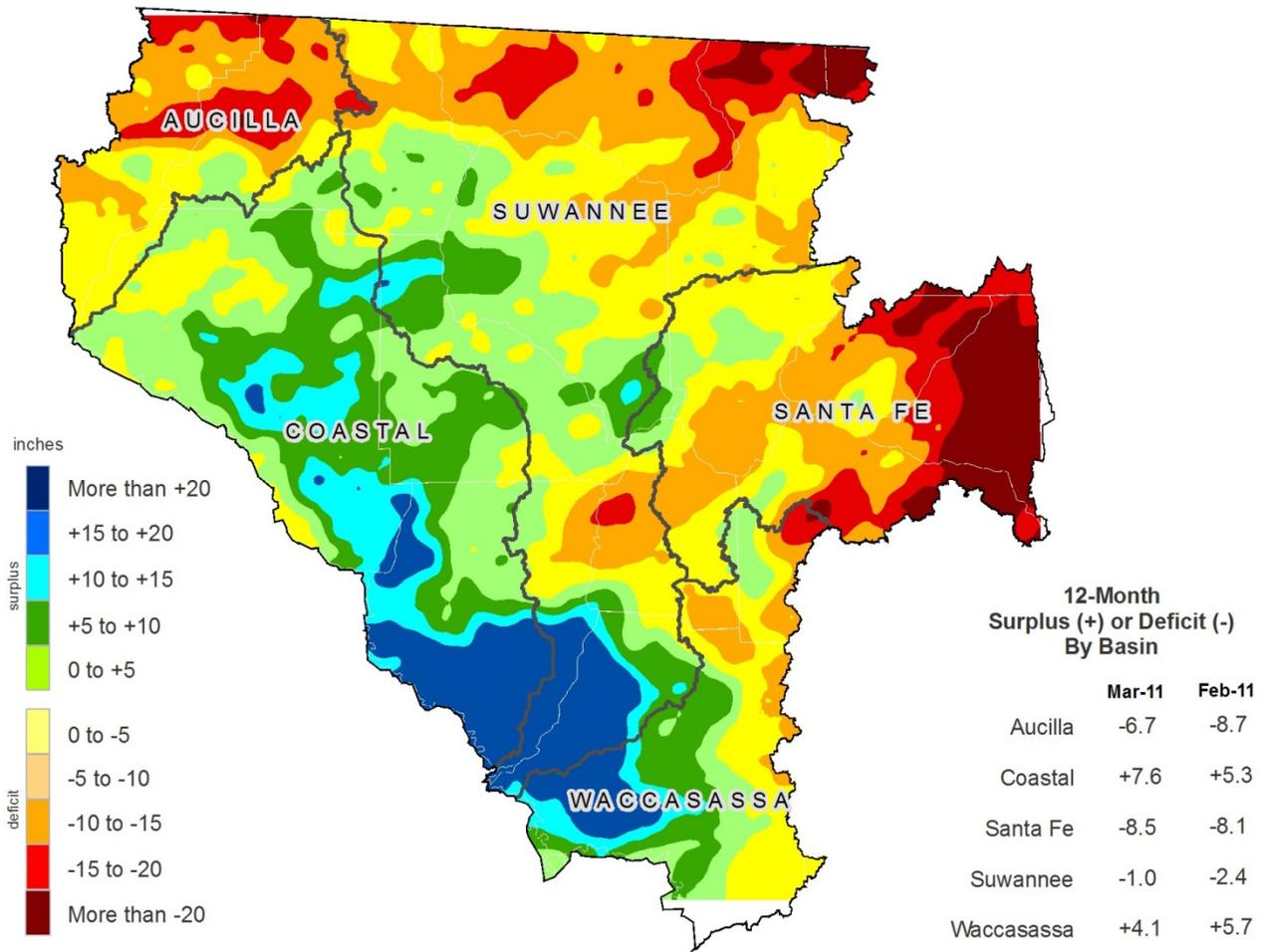


Figure 5: 12-Month Rolling Rainfall Deficit Since 1998

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

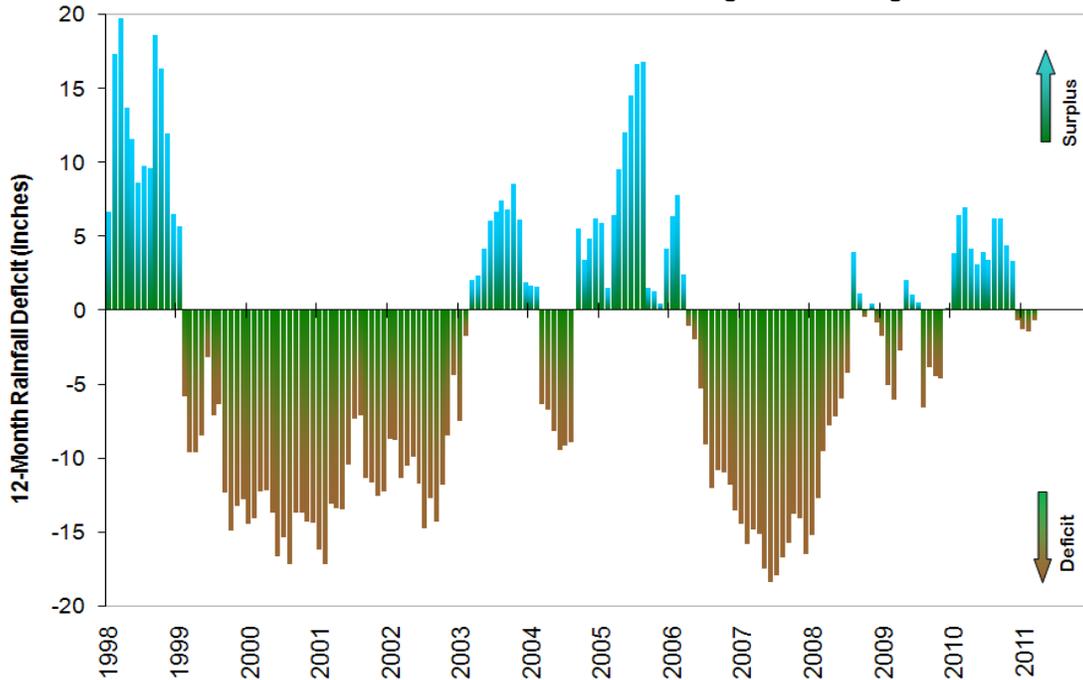
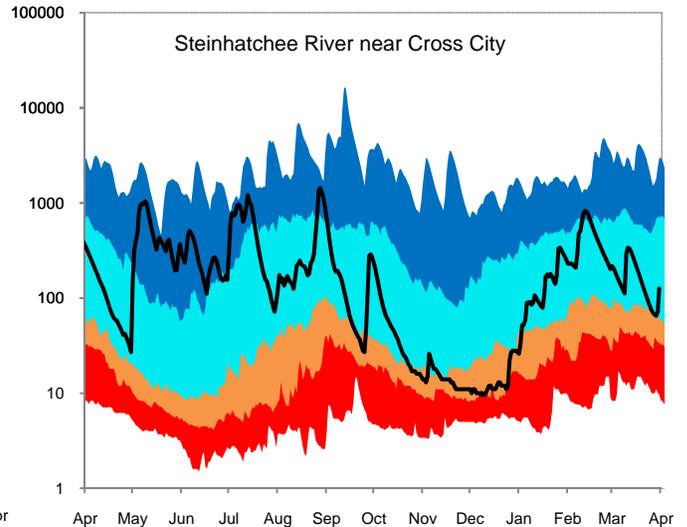
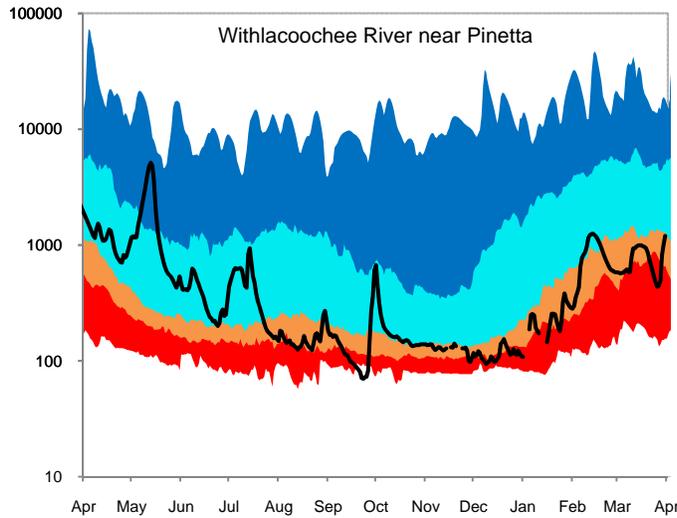
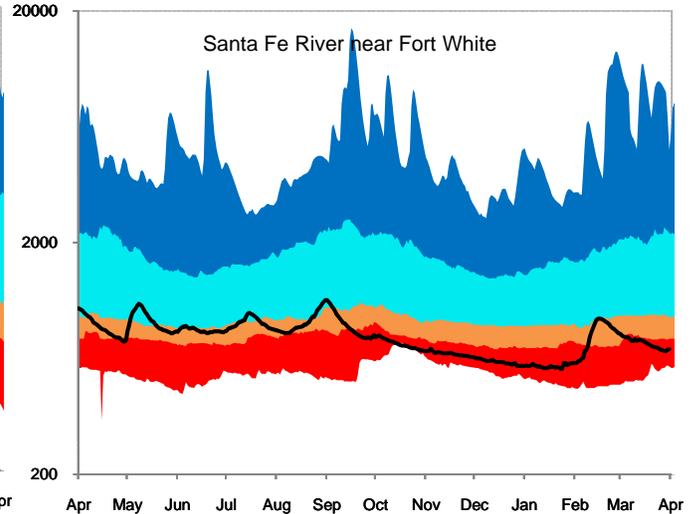
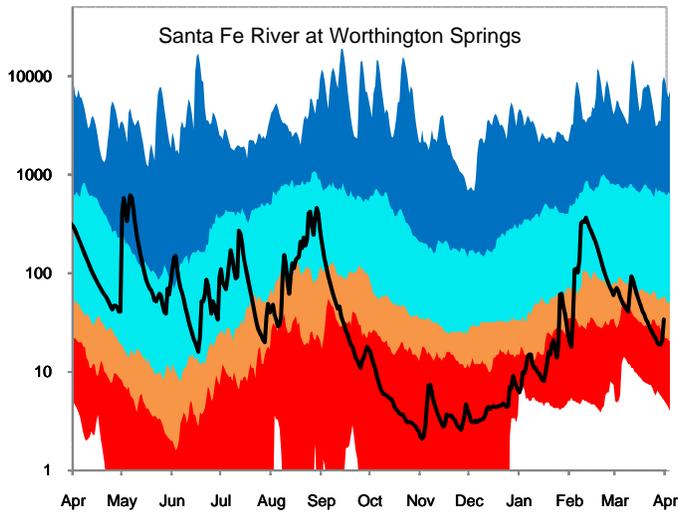
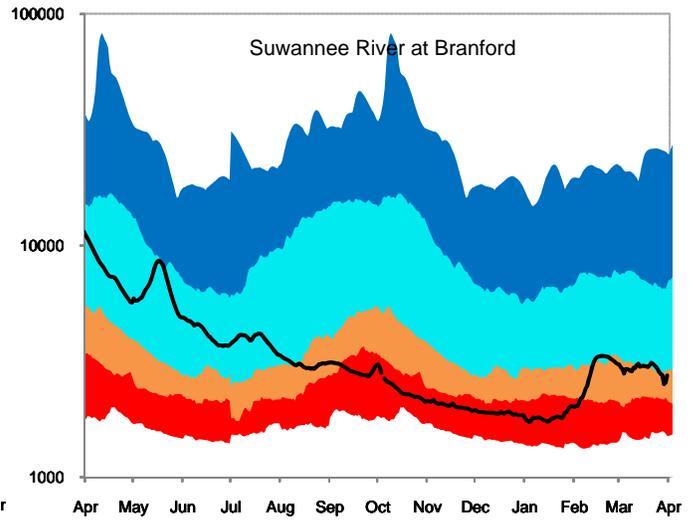
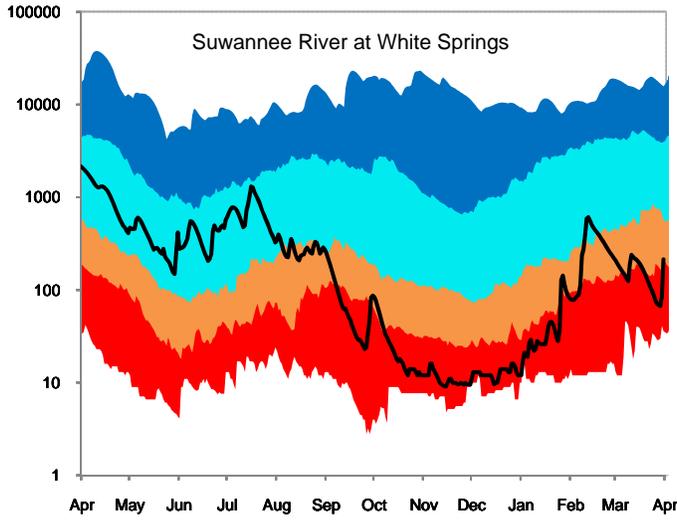
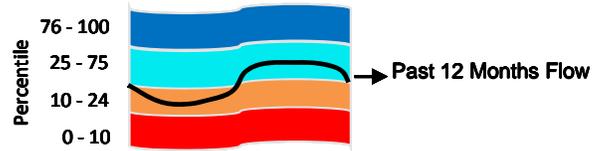


Figure 6: Daily River Flow Statistics

April 1, 2010 through March 31, 2011



RIVER FLOW, CUBIC FEET PER SECOND

Figure 7: March 2011 Streamflow Conditions

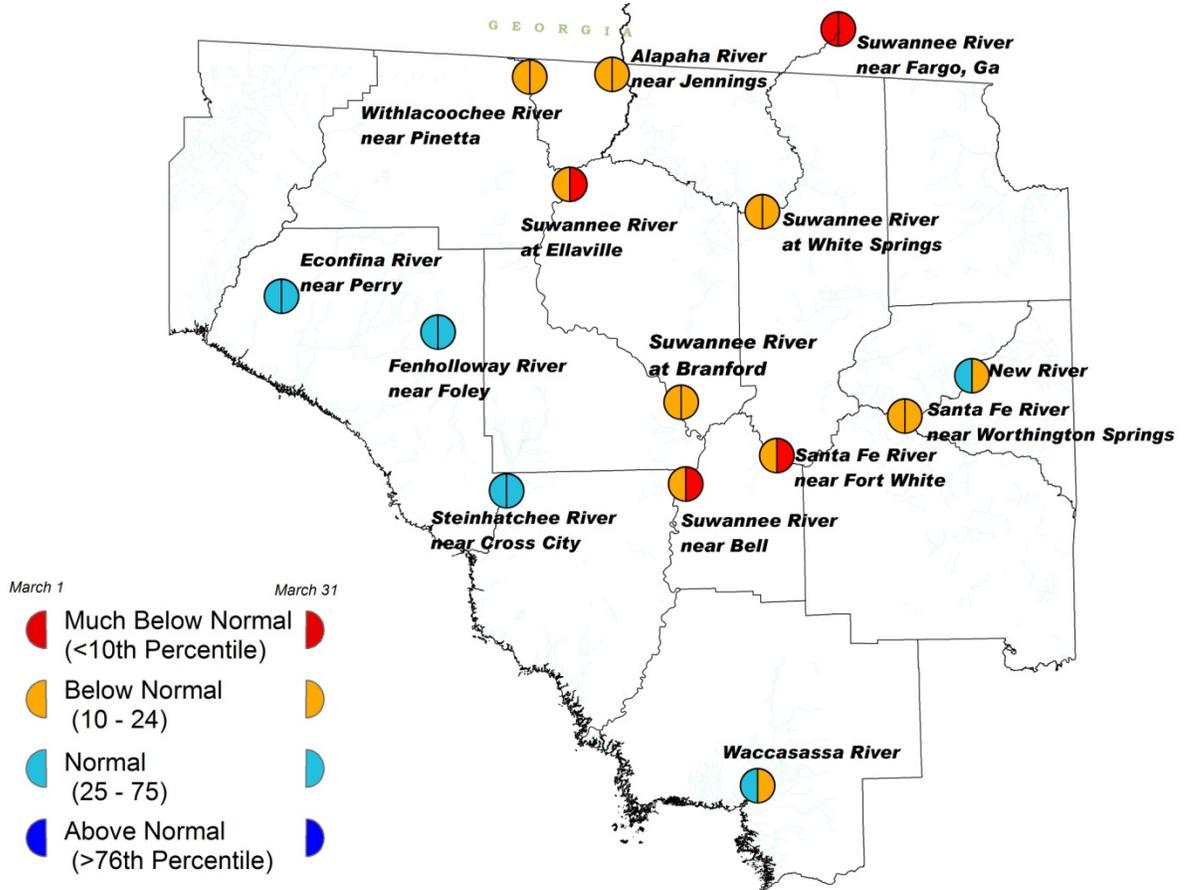


Figure 8: Lake levels, relative to historic maximum, minimum, and average levels.

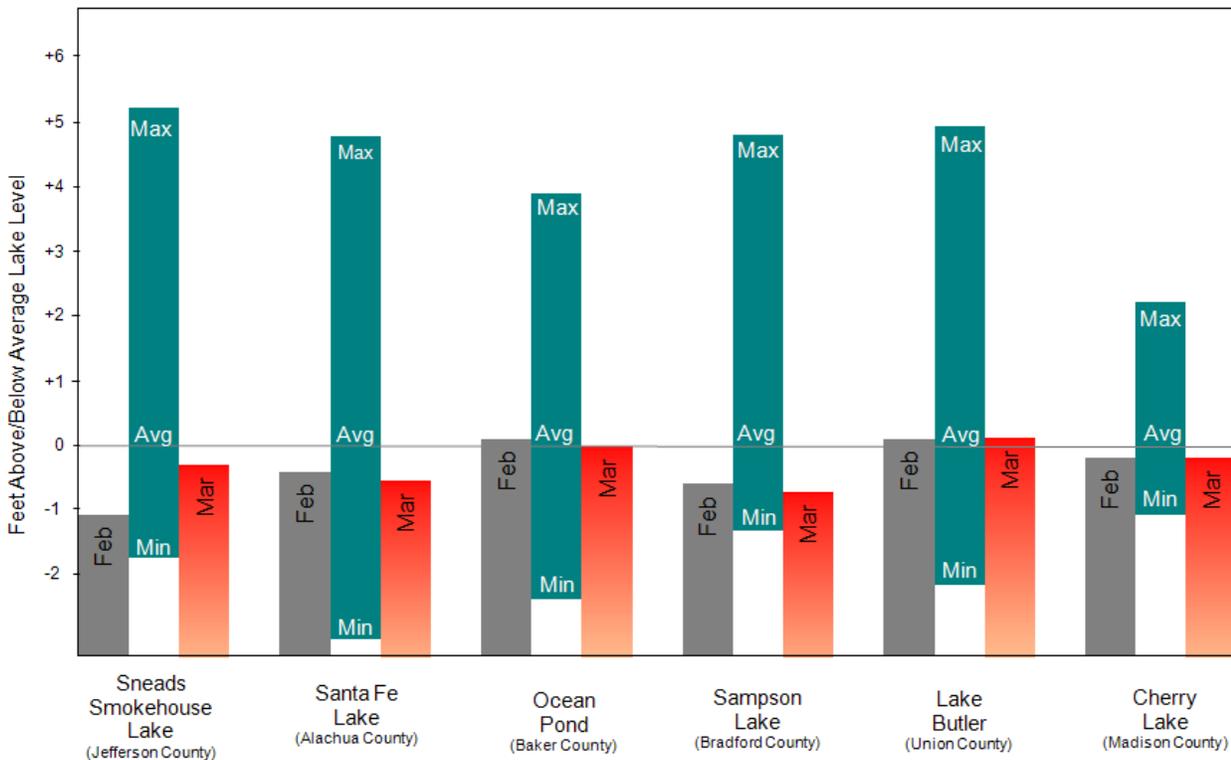
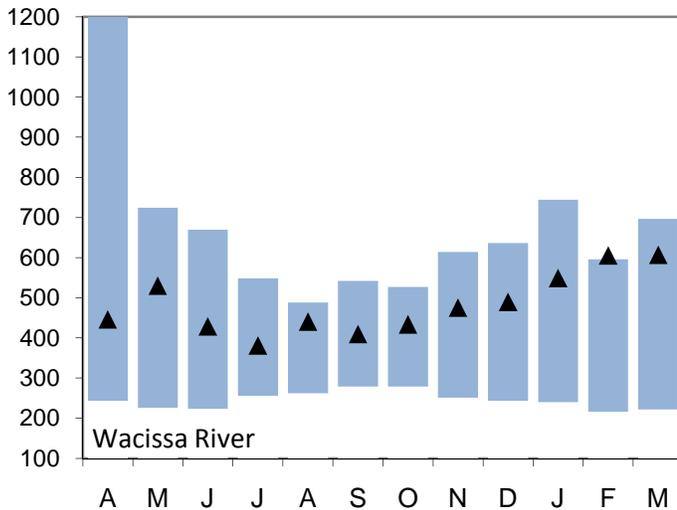
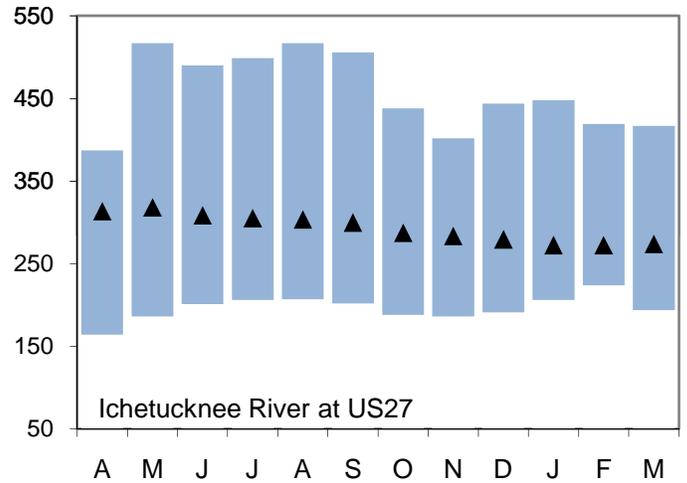
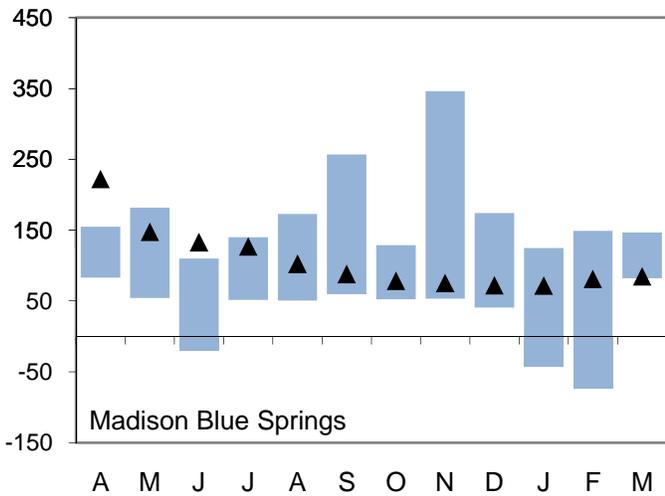
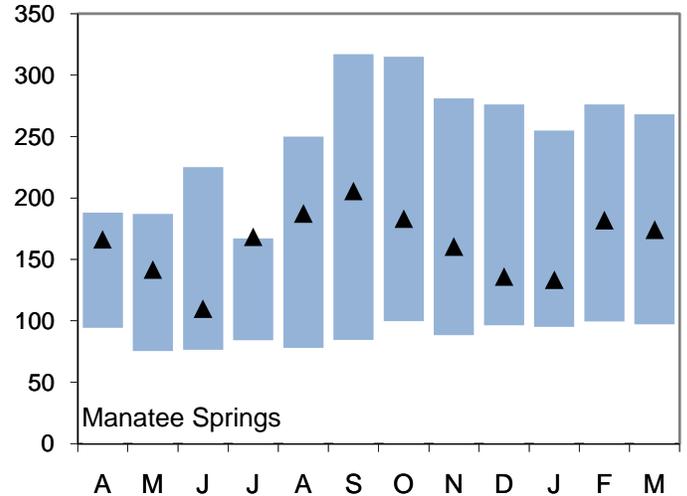
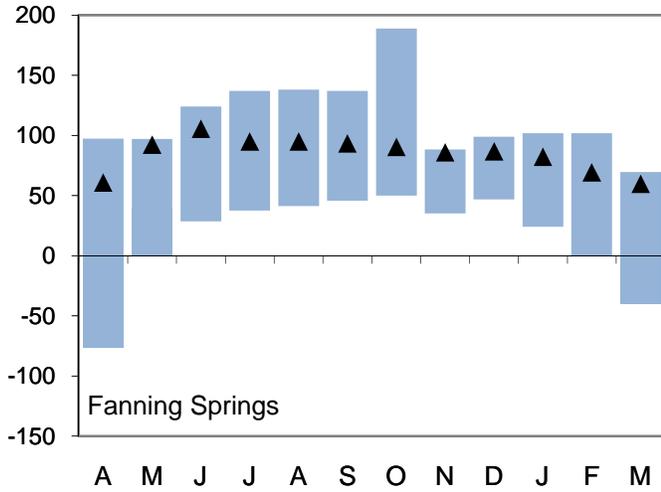
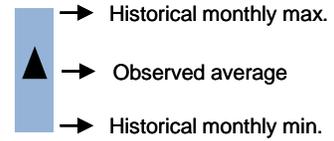


Figure 9: Monthly Springflow Statistics

Flows April 1, 2010 through March 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.

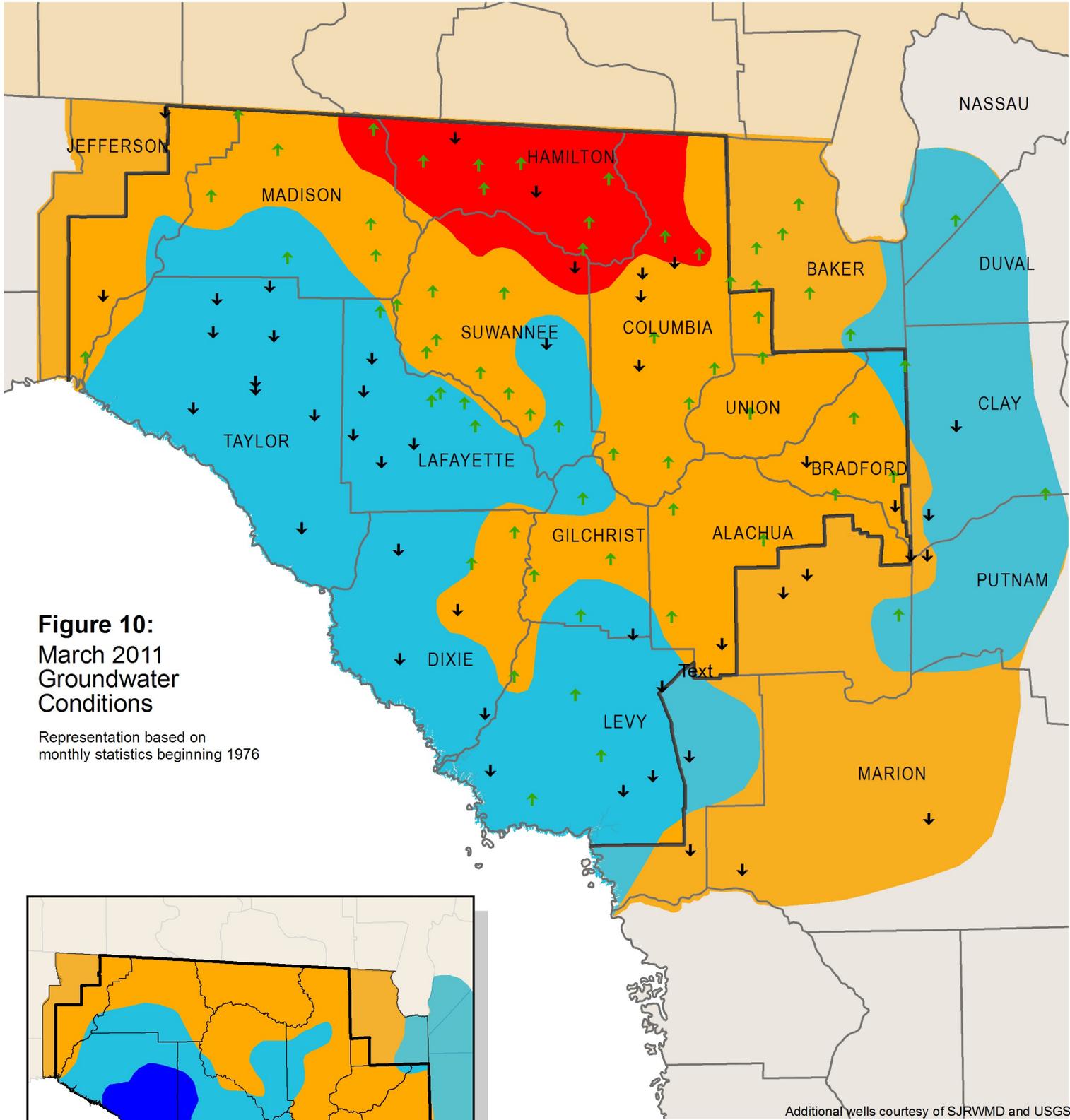


Figure 10:
March 2011
Groundwater
Conditions

Representation based on
 monthly statistics beginning 1976

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

Inset: February 2011 Groundwater Levels

Figure 11: Monthly Groundwater Level Statistics

Levels April 1, 2010 through March 31, 2011
 Period of Record Beginning 1978

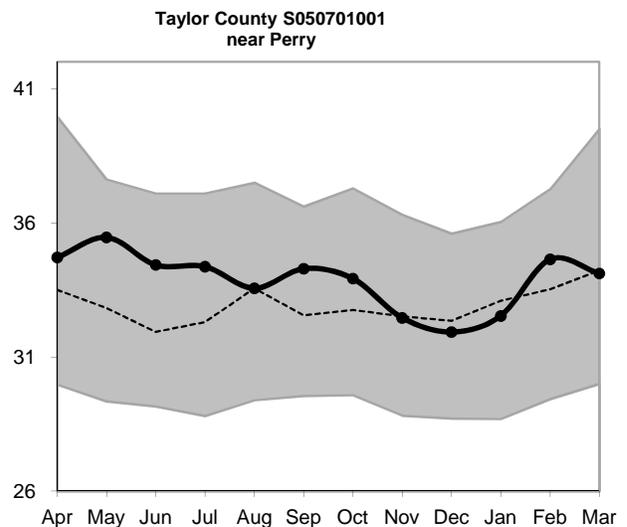
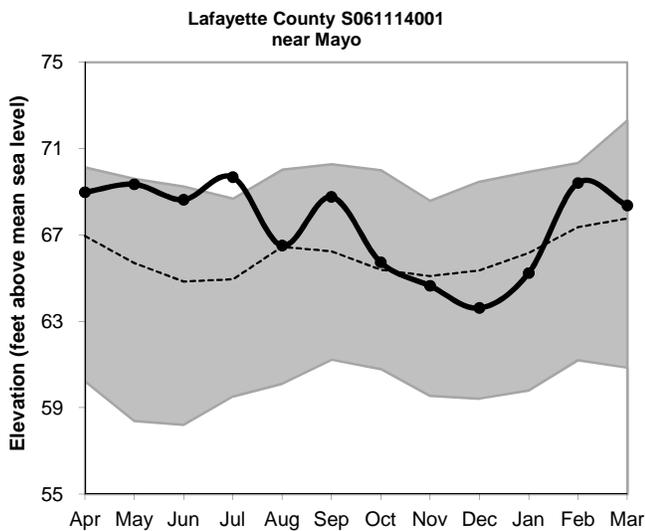
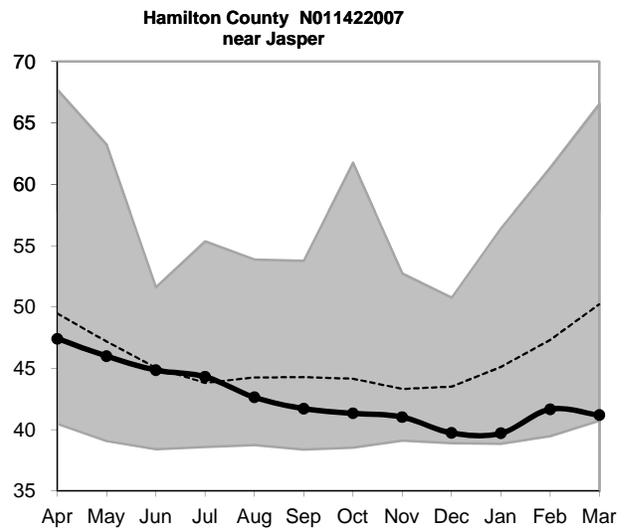
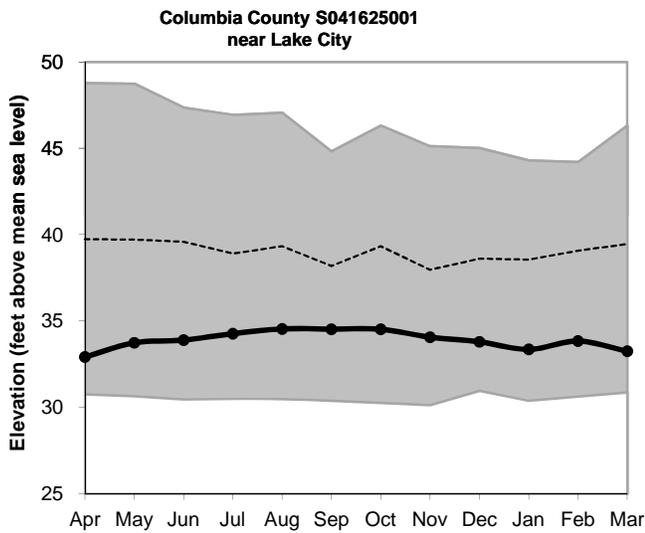
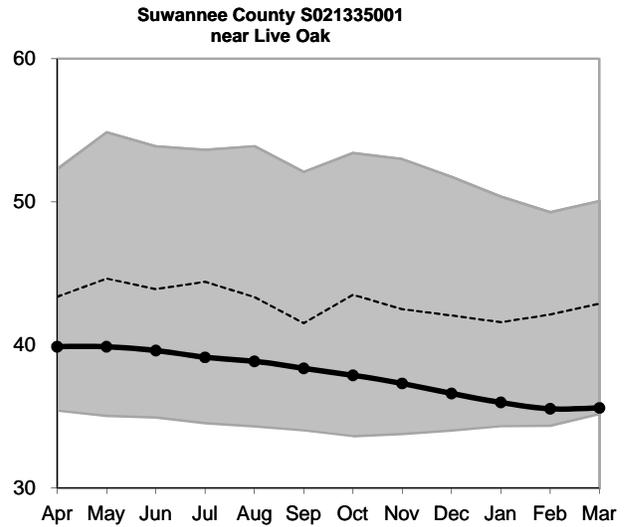
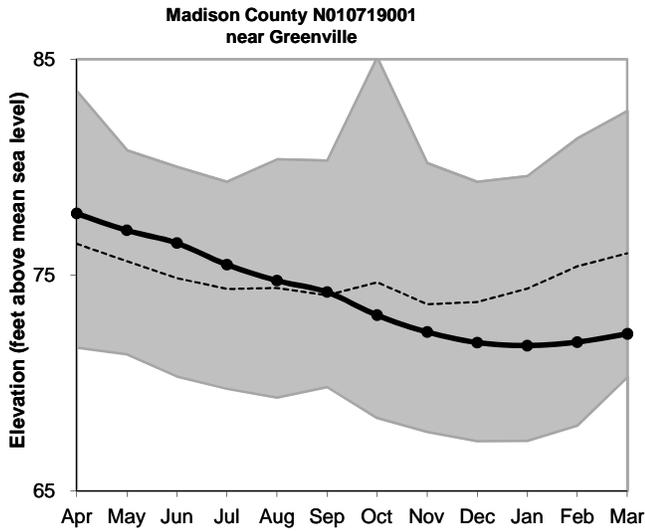
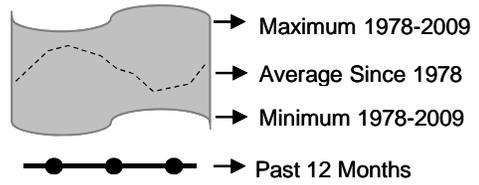


Figure 11, cont.: Groundwater Level Statistics

Levels April 1, 2010 through March 31, 2011
 Period of Record Beginning 1978

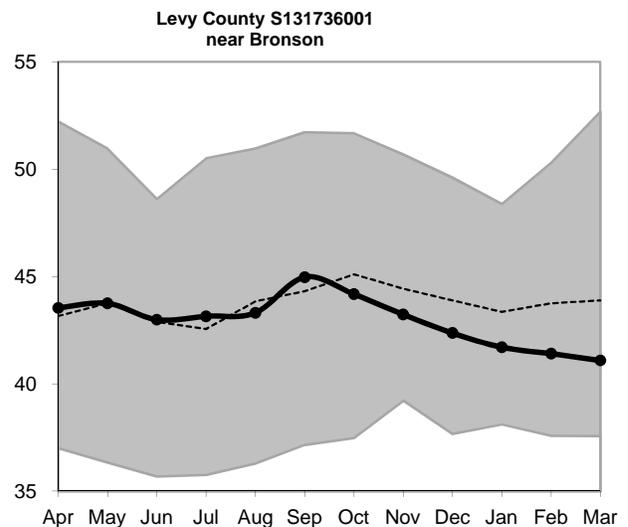
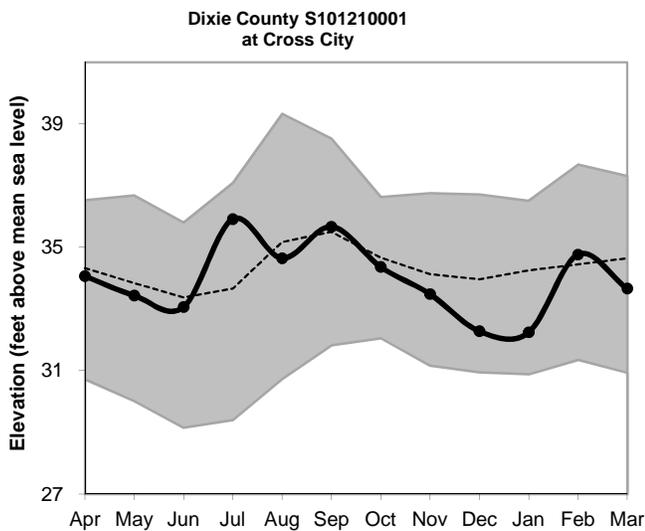
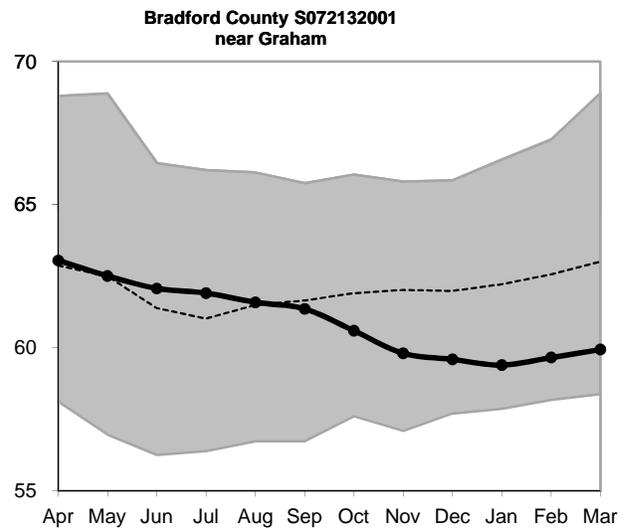
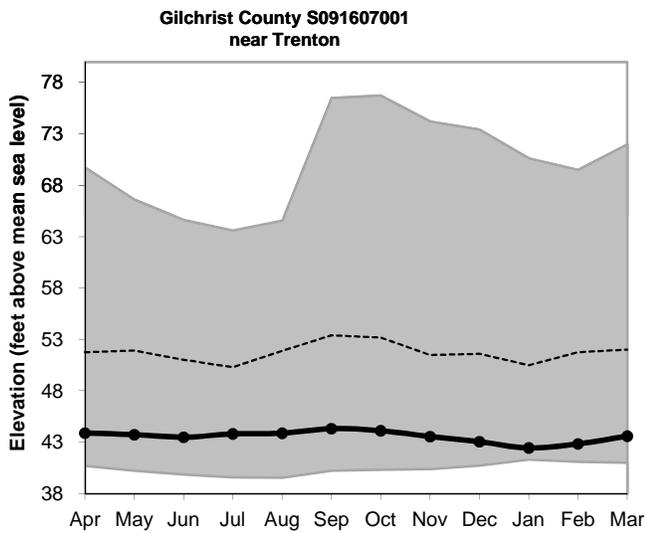
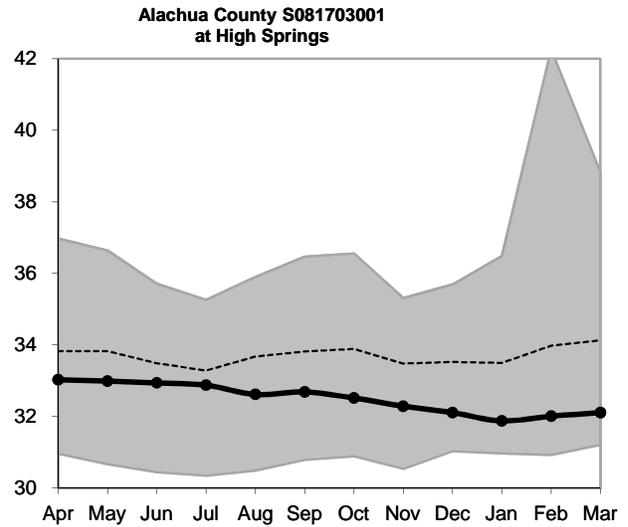
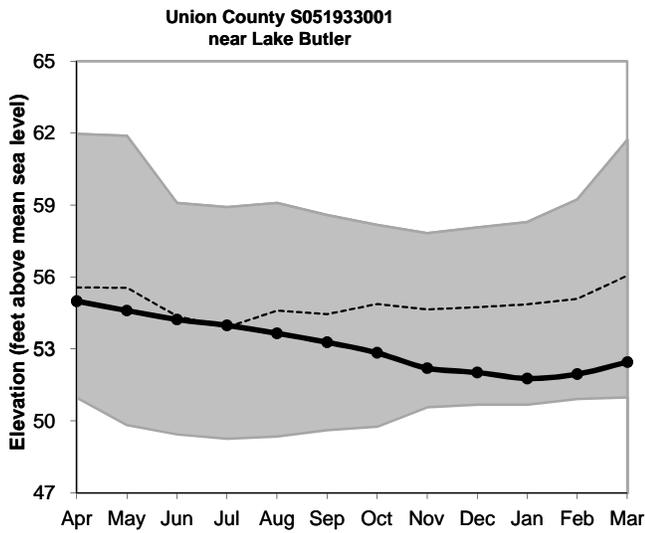
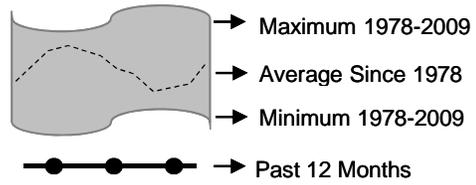


Figure 12: Long-Term Groundwater Levels

Ending March 2011

Levels in feet above mean sea level

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

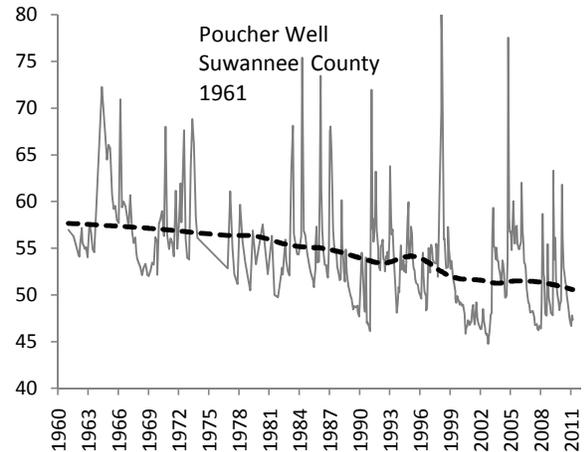
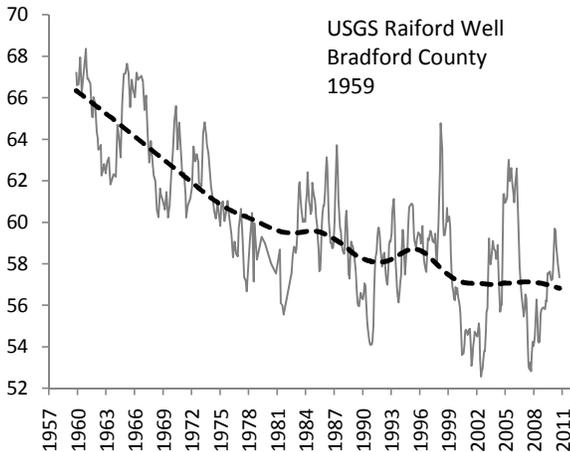
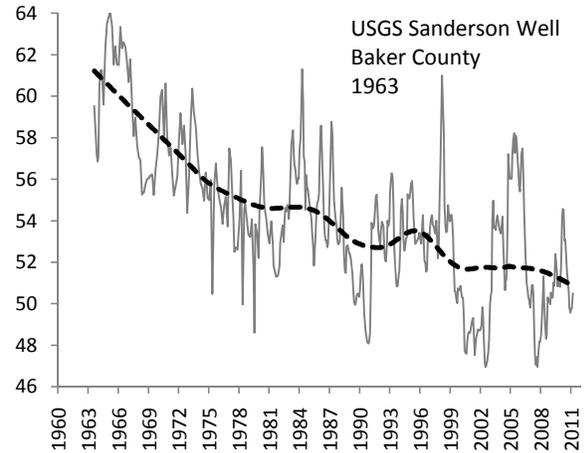
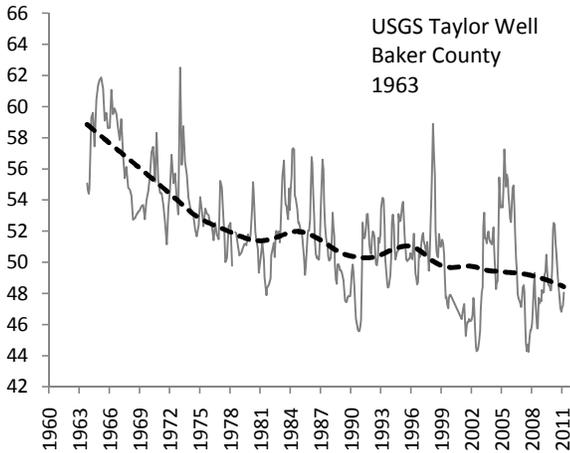
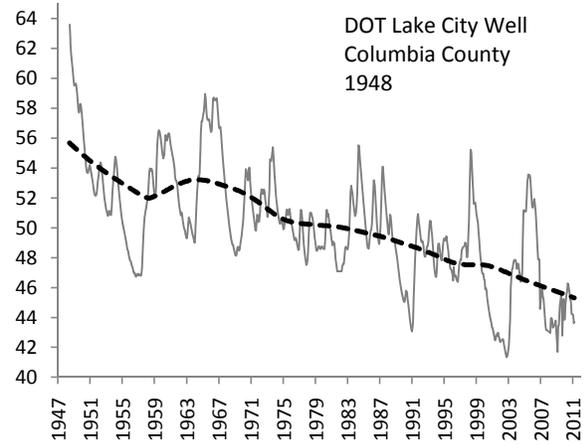
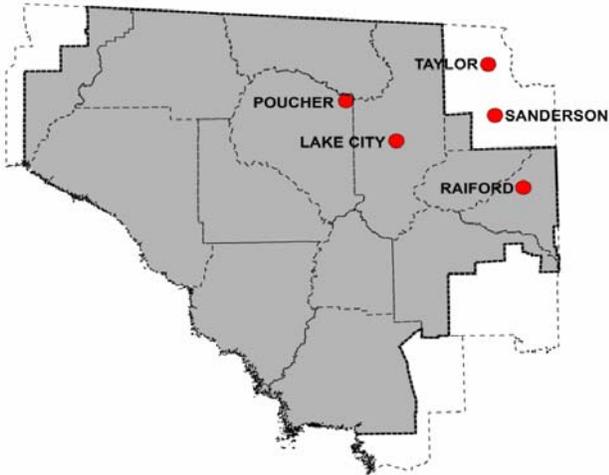


Figure 13: Agricultural Water Use

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 160 units installed at 47 agricultural operations by permission of the owners. Evapotranspiration data courtesy of University of Florida IFAS Extension.

