

MEMORANDUM

TO: Governing Board

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

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

DATE: August 9, 2011

RE: August 2011 Hydrologic Conditions Report for the District

RAINFALL

- Average rainfall based on radar estimates was 5.59", which is 74% of the long-term August average of 7.52" (Table 1, Figure 1). Distributions continued to be highly variable with the highest totals in the lower Suwannee and Santa Fe basins (Figure 2). Gaged totals ranged from 1.30" at Sneads Smokehouse Lake in Jefferson County to 9.65" at Alligator Lake in Lake City. Dixie County had the highest widespread accumulations, but the month's average was still less than normal (Figure 3).
- The average 12-month deficit increased to 11.7", the highest deficit since February 2008. Deficits nearing 25" persisted in the upper Suwannee and Santa Fe Basins (Figure 4). Figure 5 shows the change in annual deficits beginning in 1998.

SURFACEWATER

- **Rivers:** Conditions at major gages were extremely low throughout the month. The groundwater-dominated Santa Fe River near Fort White remained below the first percentile of 7-day and 30-day flows, based on records beginning in 1928. The Suwannee River at Branford stayed near the first percentile of 30-day flows. An apparent historic low stage was observed at the Withlacoochee River near Pinetta based on records beginning in 1932. Discharge statistics for six river stations are presented in Figure 6 and streamflow conditions for major gages are shown in Figure 7.
- **Lakes:** Sneads Smokehouse Lake, part of the headwaters of the Aucilla River, fell to its lowest level since records began in 1976. Low Lake in Suwannee County rose 8" after two months of record-setting low levels. Other monitored lakes remained stable, but all were below their long-term average levels. Figure 8 shows levels relative to the long-term average, minimum, and maximum levels for six lakes.

- **Springs:** Average August flow relative to historical flows is shown for five spring systems in Figure 9.

GROUNDWATER

Record monthly lows occurred at 21 wells and historic lows at 7 wells, especially in Hamilton County and boundary counties to the east (Figure 10). Levels fell in more than 50% of monitored upper Floridan Aquifer wells, but the average change was less than one inch. Average conditions across the District compared to historic August data fell to near the 10th percentile, making August the sixth consecutive month with conditions below the 25th percentile (based on records beginning no earlier than 1978). Levels at more than half the wells were below the 10th percentile. Averaged conditions in the Santa Fe Basin remained below the 5th percentile of all observations, while in the Suwannee Basin conditions fell to nearly the 10th percentile. 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 August was 0.06", up slightly from the observed July rate. 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 severity and frequency of abnormally dry or wet weather using precipitation, temperature, and soil moisture data. The PDSI indicated severe drought during the last week of August.
- The U.S. Geological Survey categorized the Suwannee River and its tributaries as being in severe hydrologic drought and other basins in the District as moderate drought.

CONSERVATION

A Phase I Water Shortage Advisory is in effect. Users are urged to eliminate unnecessary uses. Landscape irrigation is limited 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.

This report is compiled in compliance with Chapter 40B-21.211, Florida Administrative Code, using rainfall (radar-derived estimate), groundwater (108 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	Aug-2011	August Average	Last 3 Months	Last 12 Months
Alachua	5.15	7.10	16.26	38.41
Baker	5.49	6.59	16.03	38.85
Bradford	4.07	7.39	15.22	33.82
Columbia	6.07	6.63	15.69	40.23
Dixie	8.16	9.11	21.62	49.38
Gilchrist	5.74	7.83	18.34	44.66
Hamilton	4.35	6.13	13.59	39.22
Jefferson	3.56	6.46	12.90	40.07
Lafayette	5.98	7.78	15.33	43.74
Levy	7.56	9.80	20.01	46.19
Madison	5.10	6.13	15.97	44.60
Suwannee	6.24	6.40	16.63	45.31
Taylor	3.84	8.01	14.91	44.32
Union	4.73	7.77	15.03	36.13

August 2011 Average: 5.59
 Historical August Average (since 1932): 7.52
 Historical 12-month Average (since 1932): 54.68
 Past 12-Month Total: 42.99
 12-month Rainfall Deficit: -11.69

(Rainfall reported in inches)

Figure 1: Comparison of District Monthly Rainfall

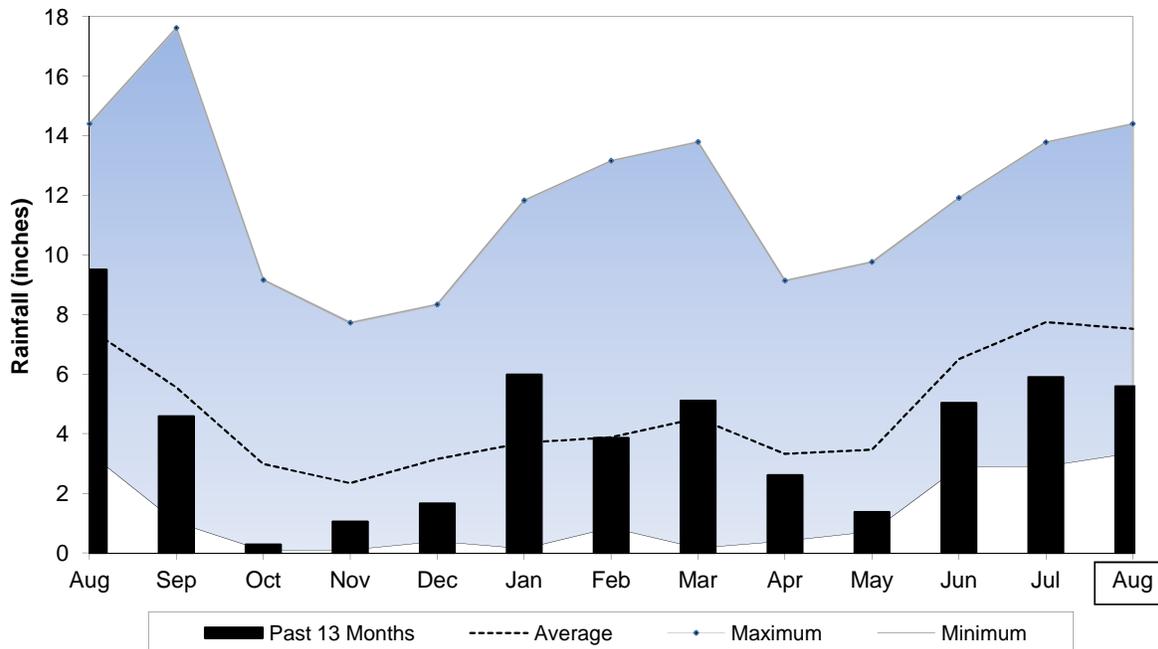


Figure 2: August 2011 Rainfall Estimate

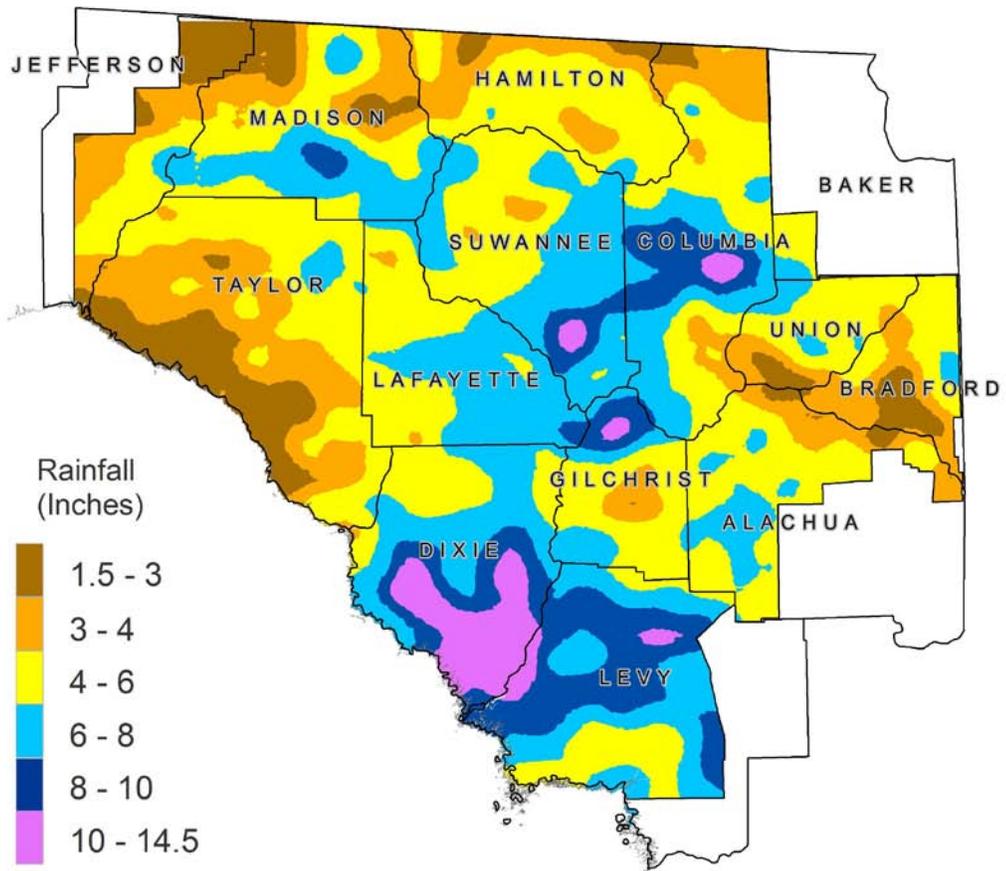


Figure 3: August 2011 Percent of Normal Rainfall

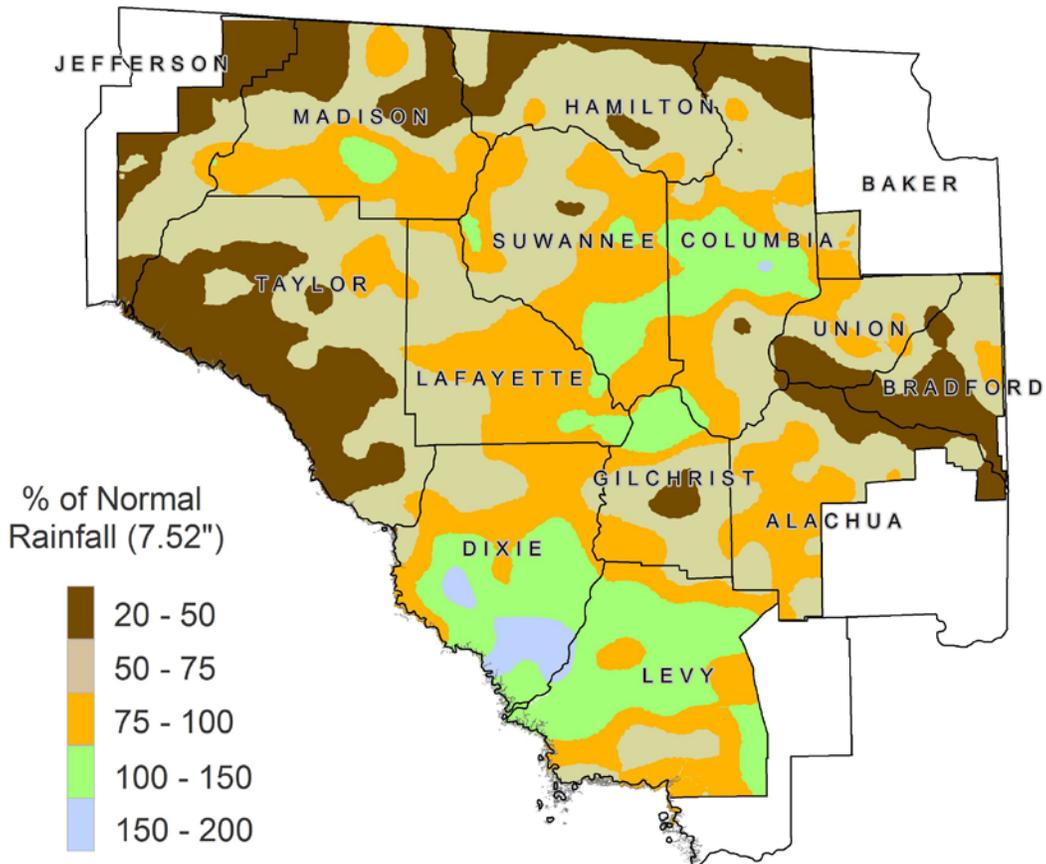


Figure 4: 12-Month Rainfall Surplus/Deficit by River Basin Ending August 31, 2011

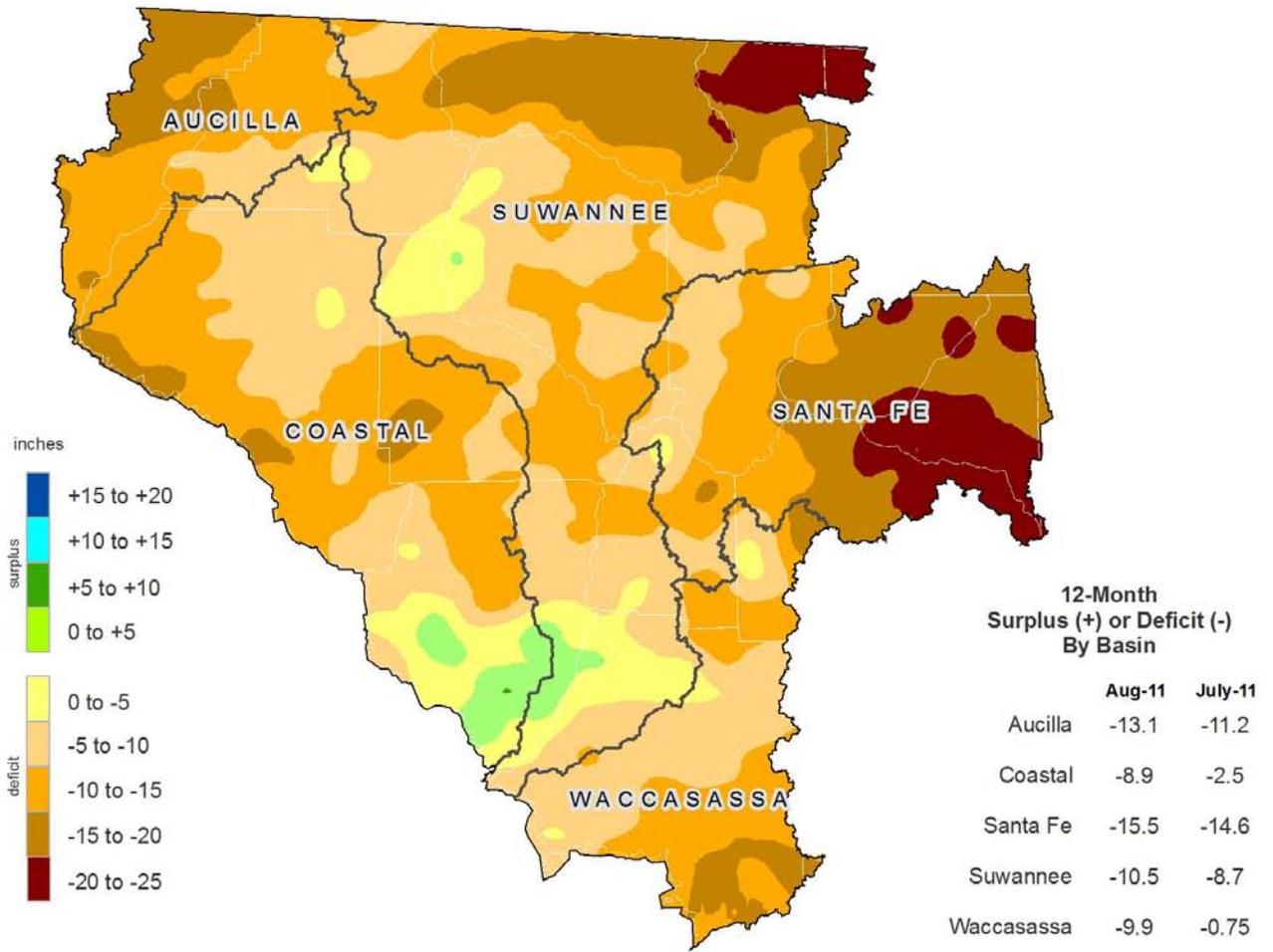


Figure 5: 12-Month Rolling Rainfall Deficit Since 1998

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

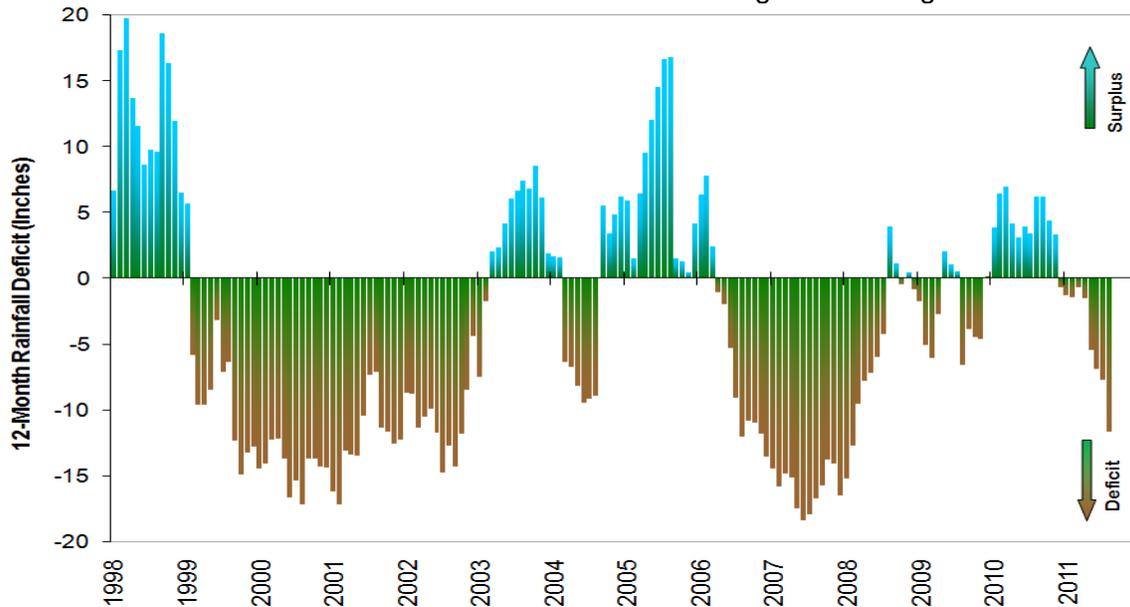
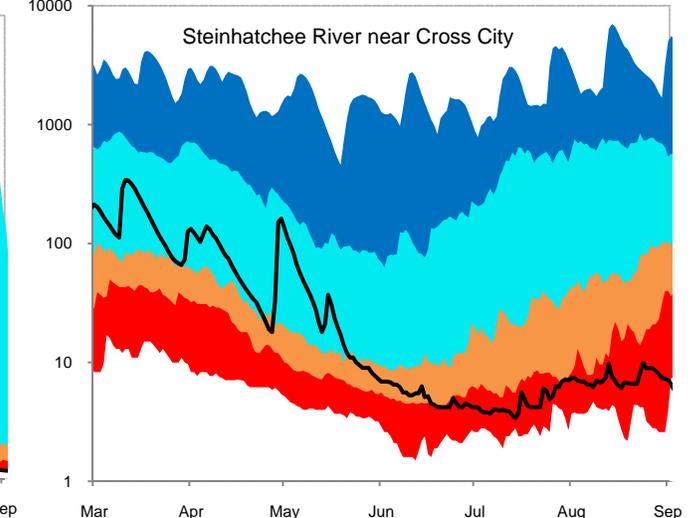
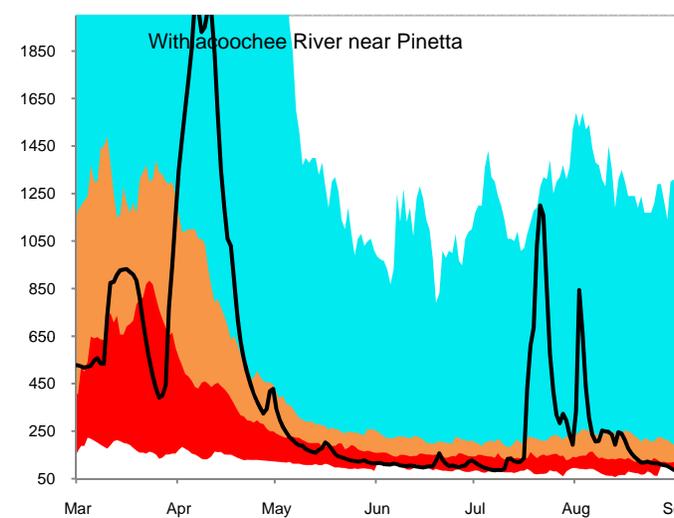
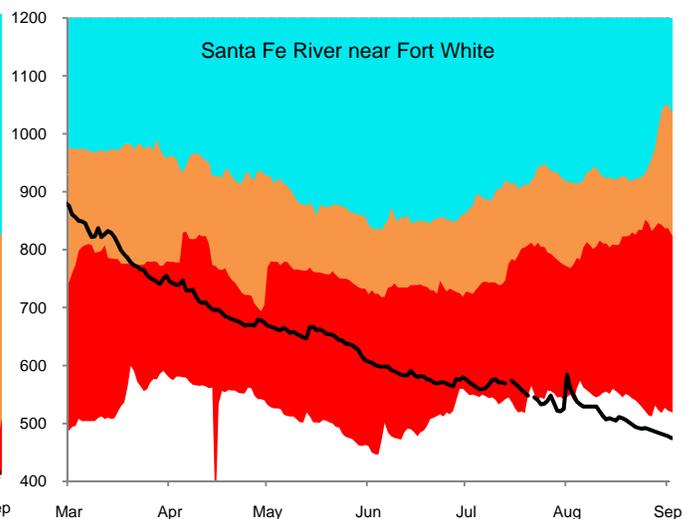
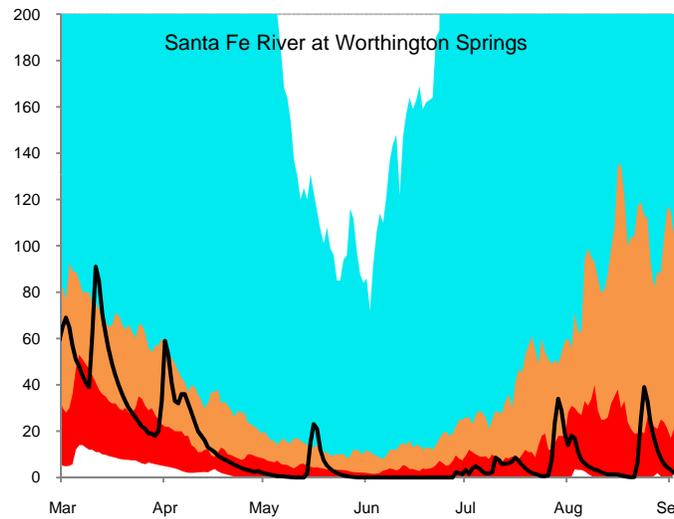
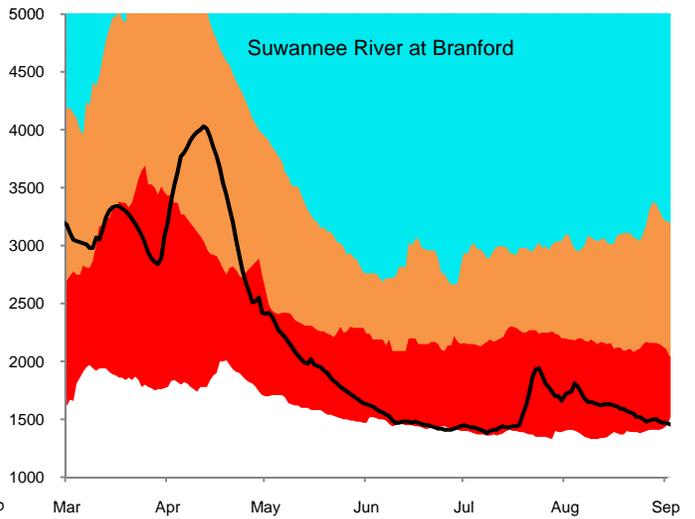
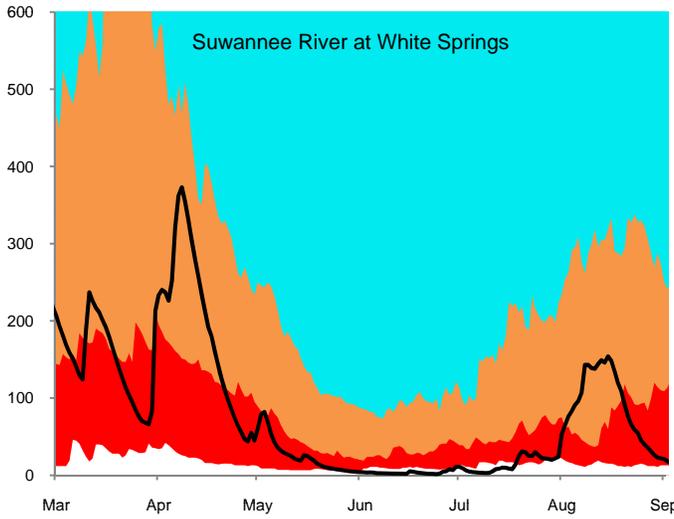
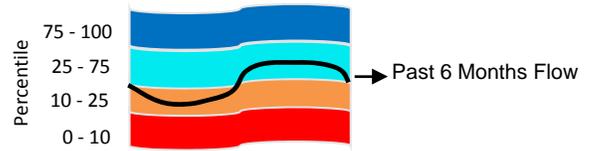


Figure 6: Daily River Flow Statistics
 March 1, 2011 through August 31, 2011



RIVER FLOW, CUBIC FEET PER SECOND

Figure 7: August 2011 Streamflow Conditions

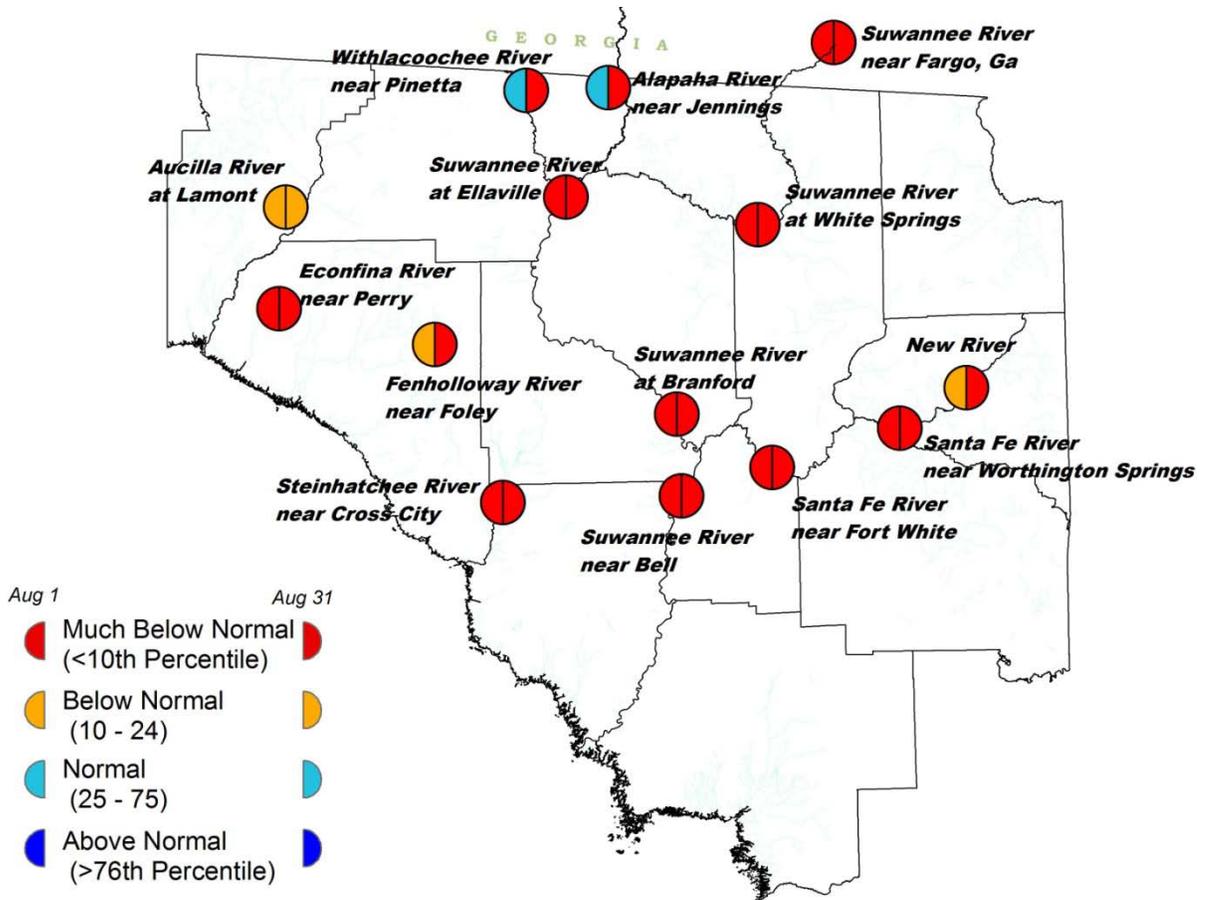


Figure 8: Lake levels relative to historic maximum, minimum, and average levels.

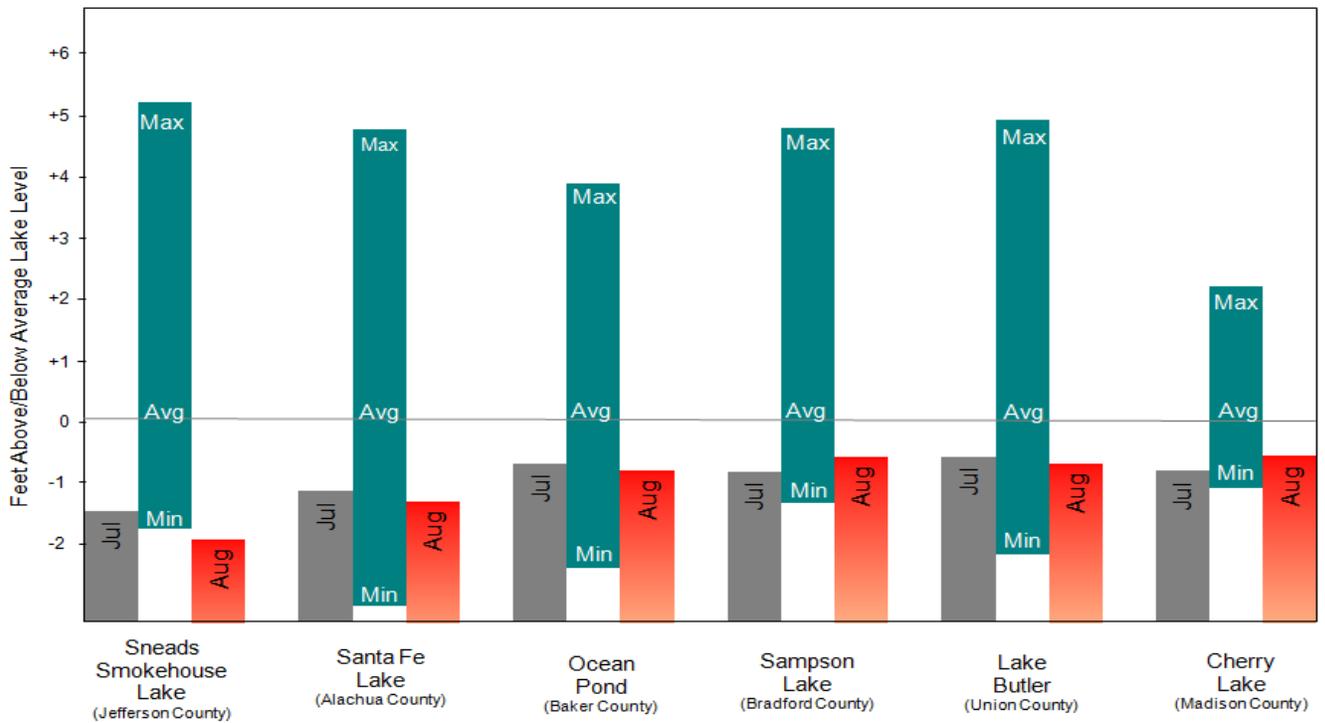
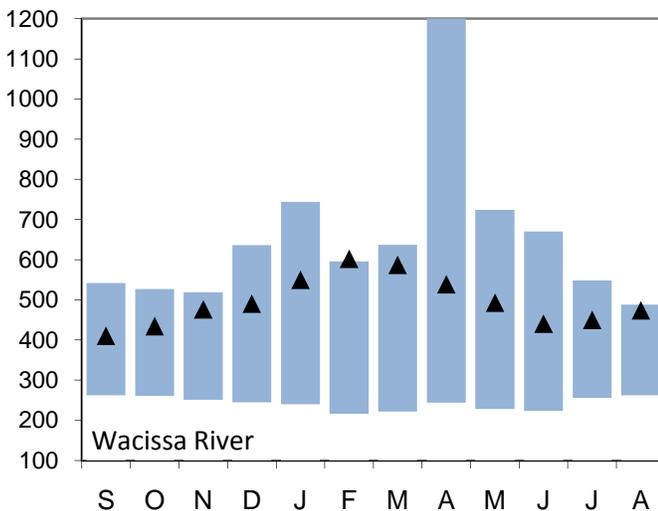
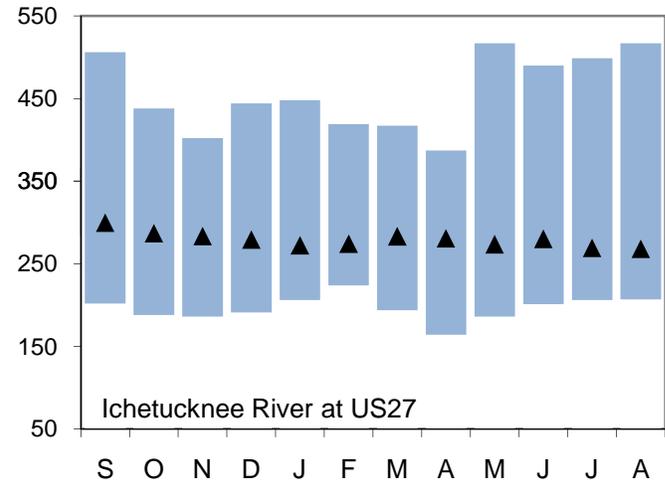
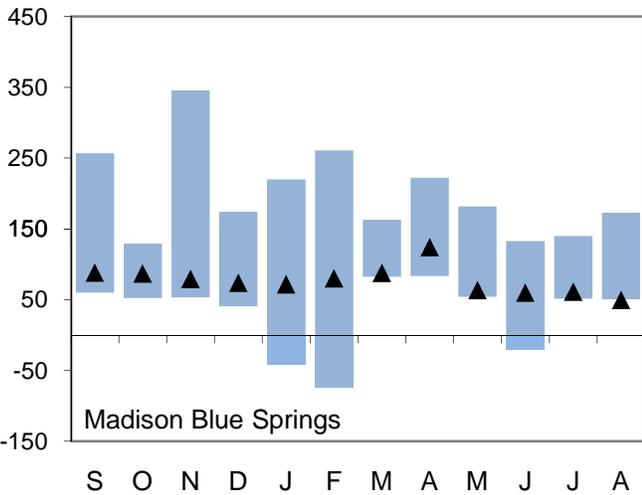
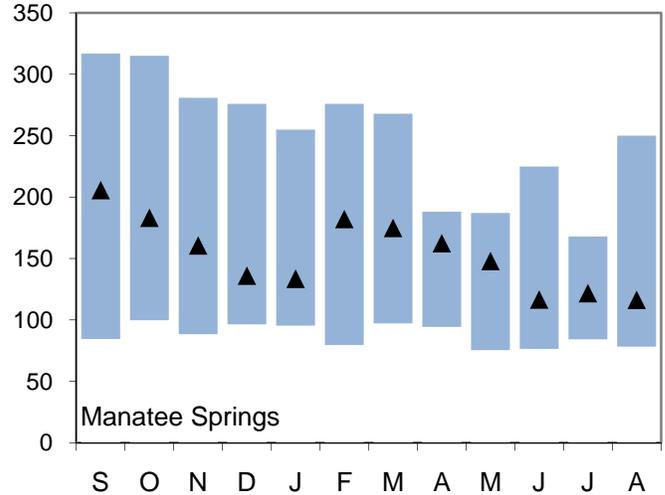
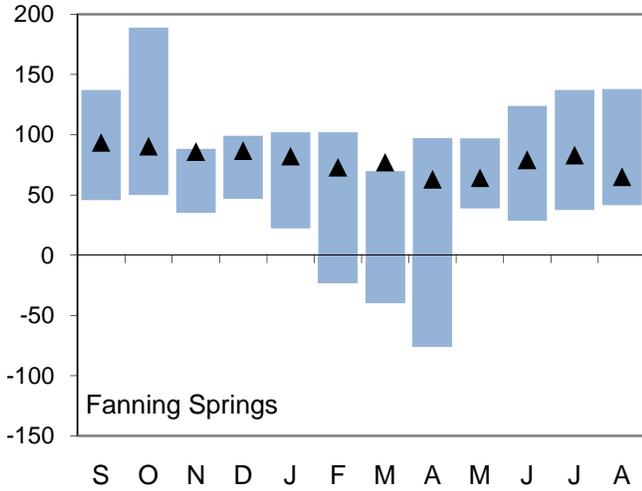
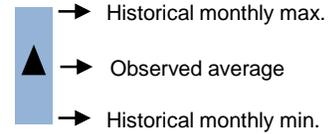


Figure 9: Monthly Springflow Statistics

Flows September 1, 2010 through August 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.

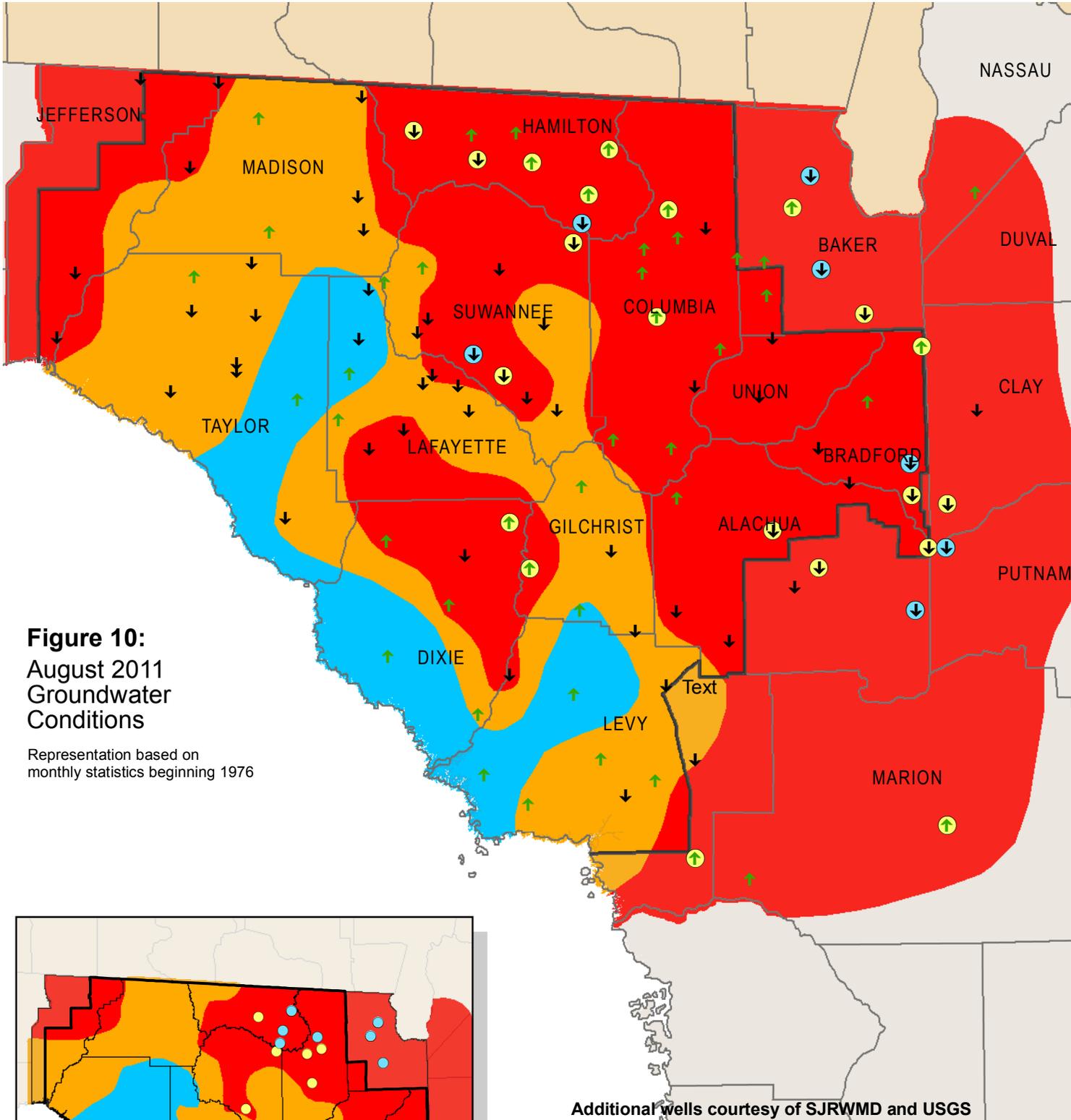


Figure 10:
August 2011
Groundwater
Conditions

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
- Record Low for Month
- Historic Low

Inset: July 2011 Groundwater Levels

Figure 11: Monthly Groundwater Level Statistics

Levels September 1, 2010 through August 31, 2011
 Period of Record Beginning 1978

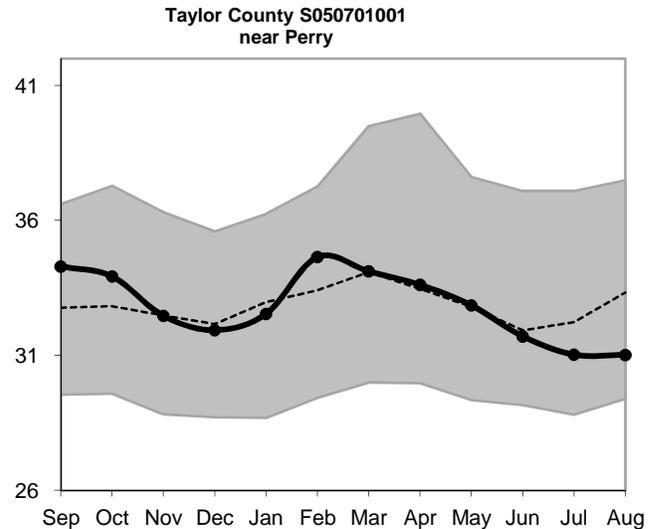
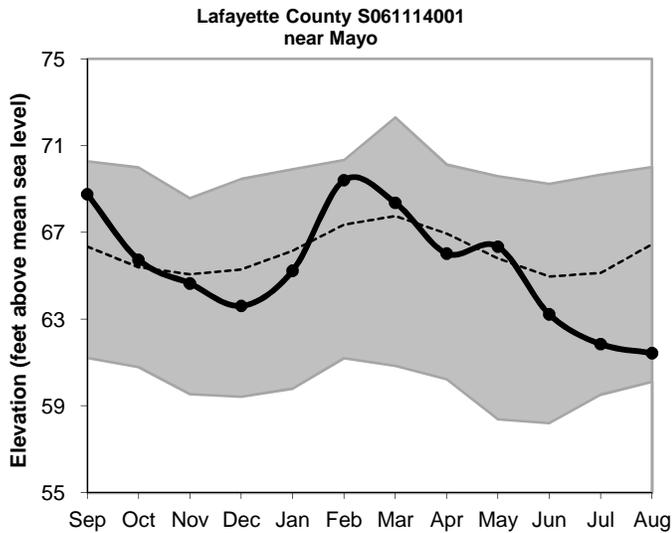
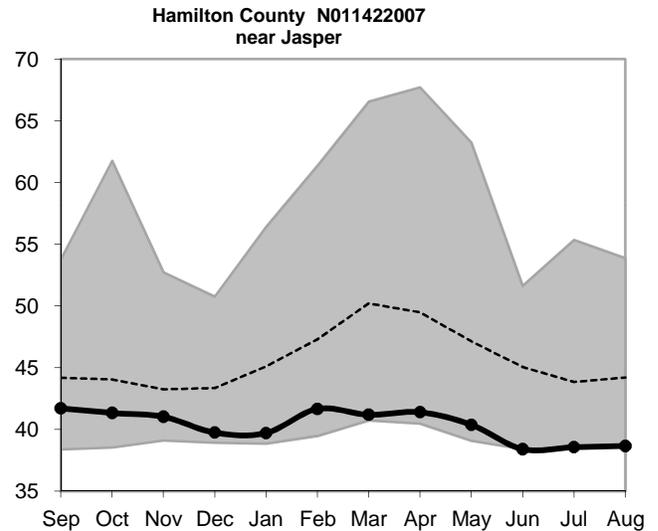
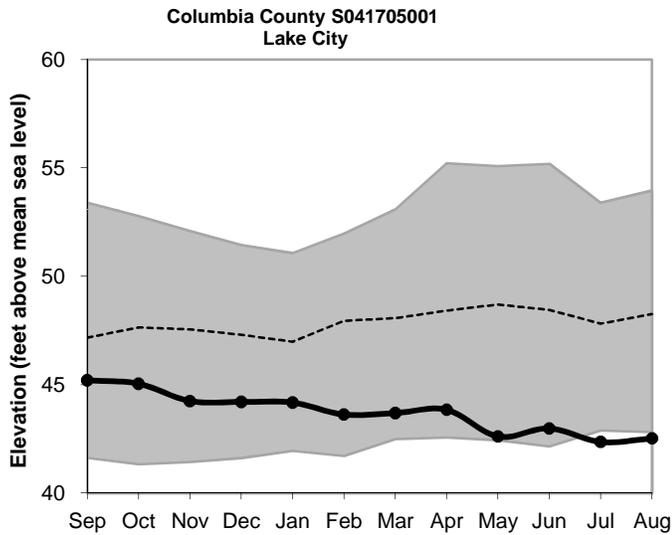
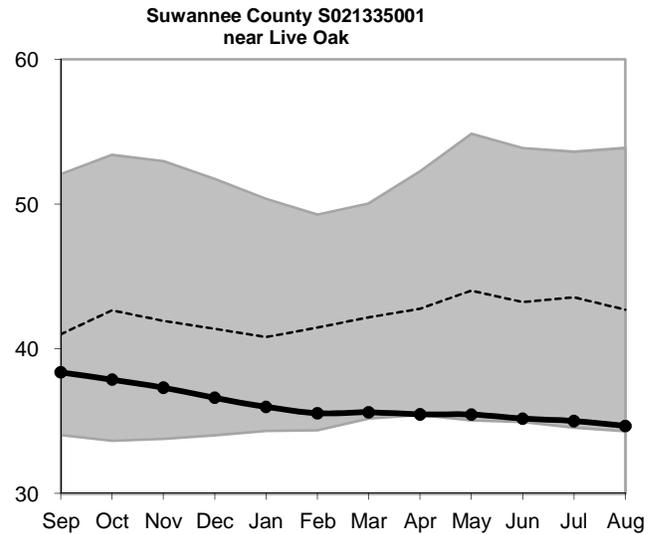
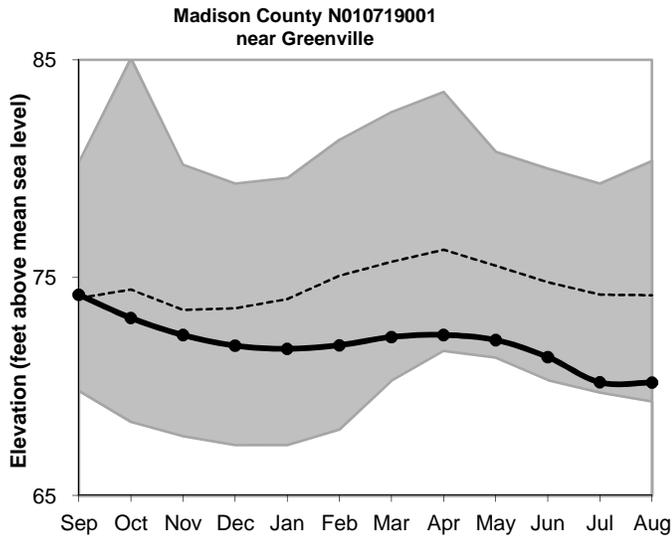
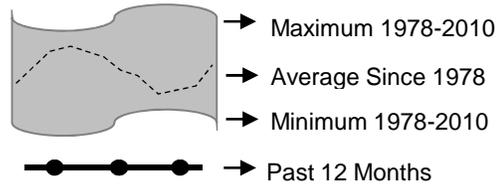


Figure 11, cont.: Groundwater Level Statistics

Levels September 1, 2010 through August 31, 2011
 Period of Record Beginning 1978

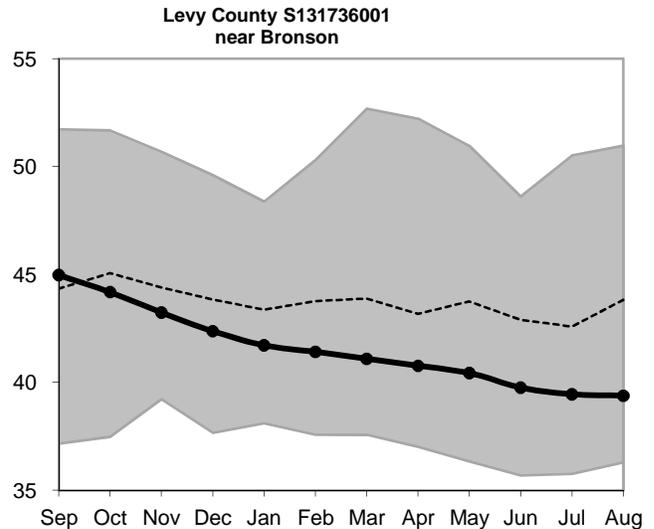
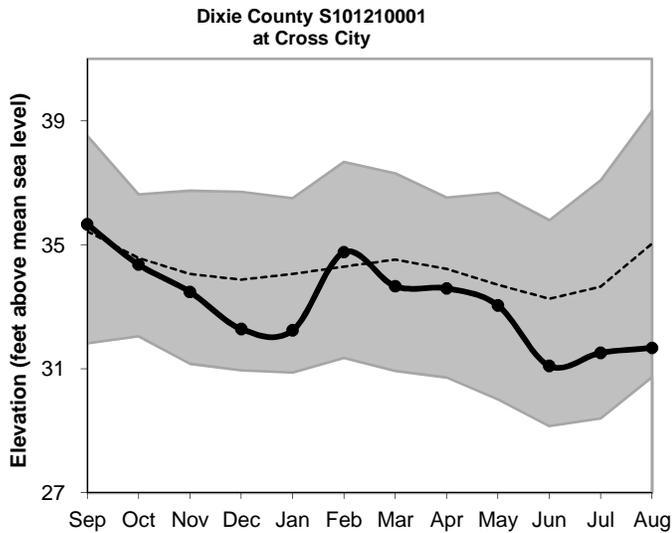
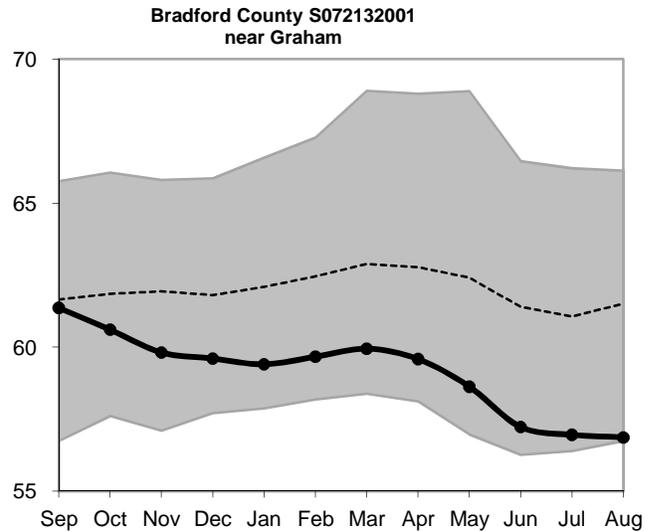
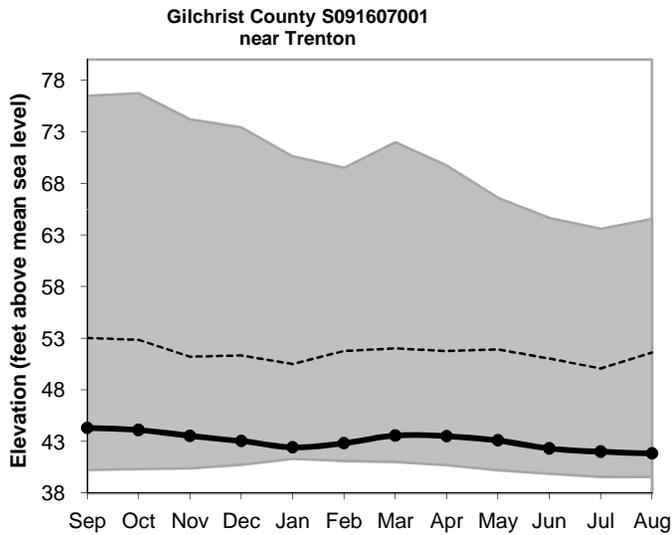
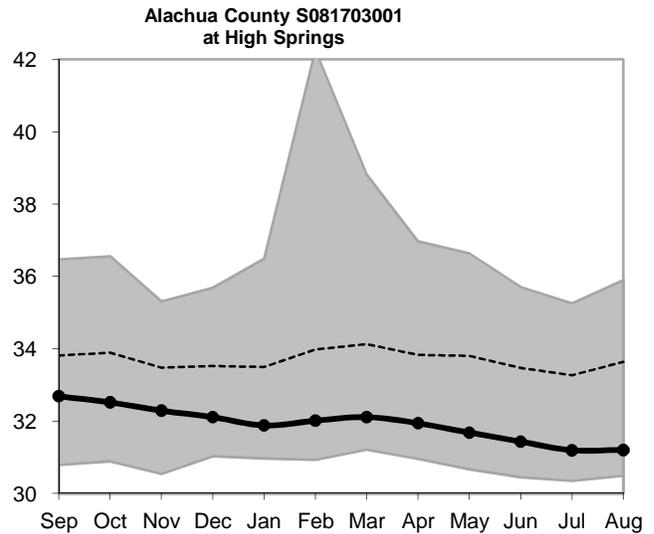
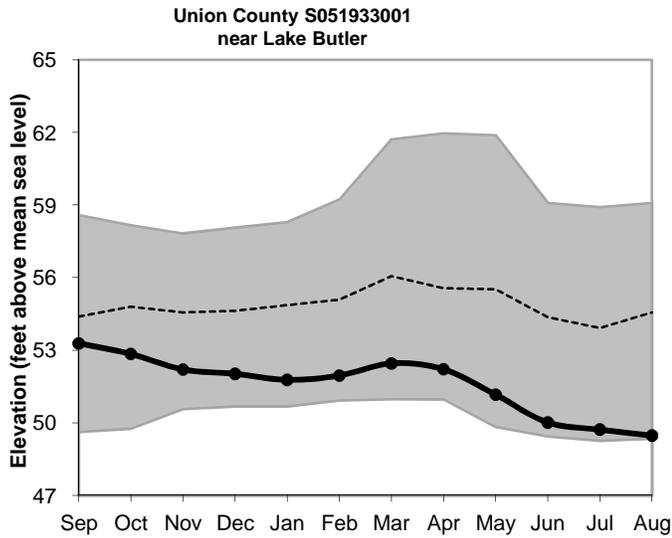
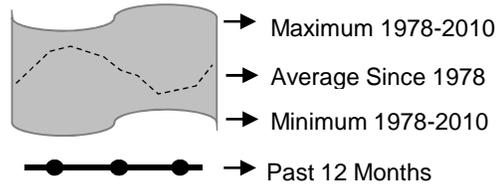


Figure 12: Long-Term Groundwater Levels

Ending August 2011

Levels in feet above mean sea level

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

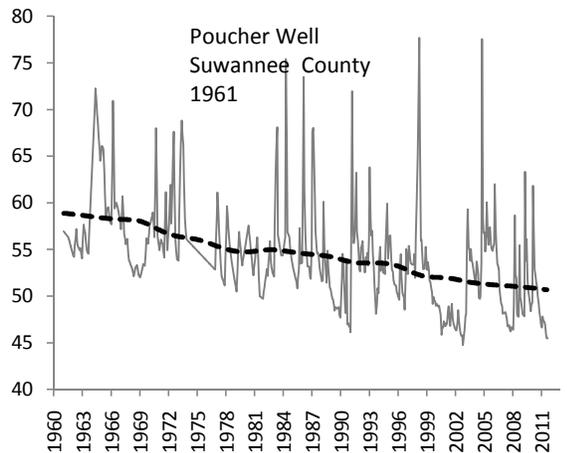
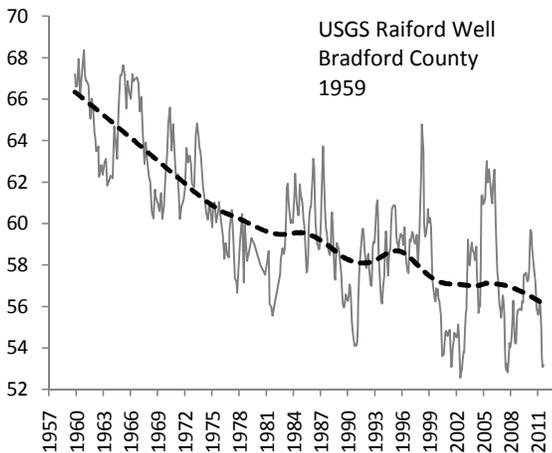
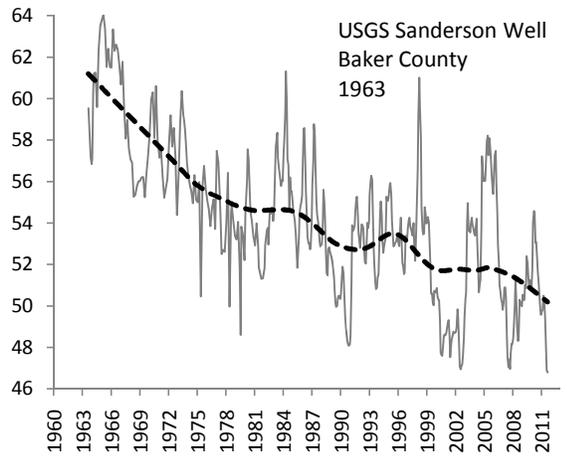
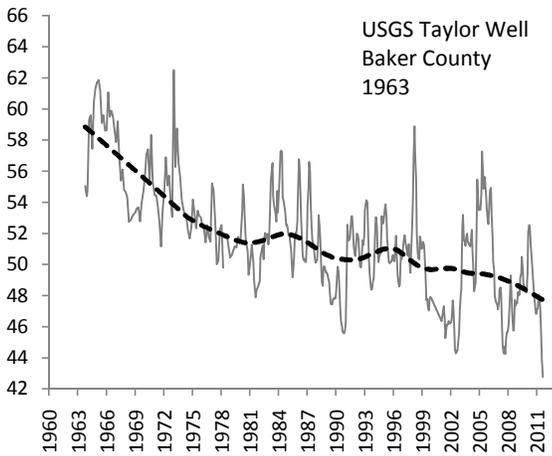
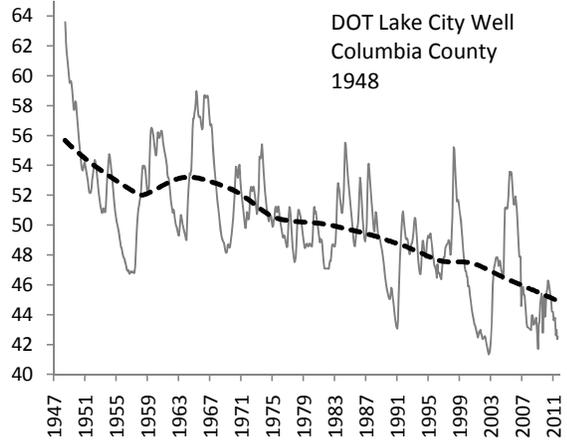
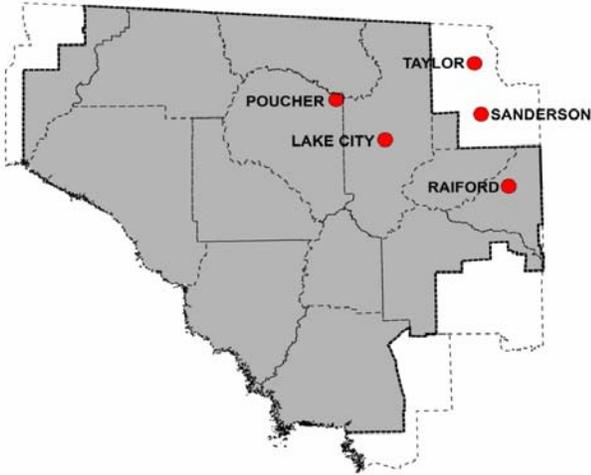


Figure 13: Agricultural Water Use

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 181 units installed at 48 agricultural operations by permission of the owners. Evapotranspiration data courtesy of University of Florida IFAS Extension.

