

## SUWANNEE RIVER WATER MANAGEMENT DISTRICT

### MEMORANDUM

TO: Governing Board

FROM: Robbie McKinney, Hydrologic Program Manager, Office of Water Resources

THRU: Hugh Thomas, Executive Director

DATE: August 31, 2023

RE: August 2023 Hydrologic Conditions Report

#### RAINFALL

- Districtwide average rainfall for the month was 7.07", which was about 7% lower than the 1932-2022 average of 7.61" (Table 1, Figure 1). The 12-month period ending August 31 reflected a Districtwide rainfall deficit of 4.70", which was a slight increase in the 3.85" deficit seen at the end of July. Most District counties received between 5" and 8" of rainfall on average with sizable areas of Jefferson, Madison, Hamilton, Taylor, Lafayette, Dixie, and Bradford counties receiving more than 10" of rainfall (Figure 2).
- A 12-month rainfall deficit was present for each river basin, with all but the Aucilla increasing in deficit by the end of August (Figure 3). Four of the basins contained areas with surpluses of greater than 6", and each basin had portions with greater than 14" deficits at the end of August. Most river basins showed 3-month rainfall surpluses, with the Santa Fe Basin transitioning from a surplus to deficit at the end of the month (Figure 4). Areas within three of the basins showed surpluses greater than 10" at the end of August due to increased localized rainfall amounts over the past few months. Both the Suwannee and Santa Fe basins had areas with deficits greater than 6" at month's end.

#### SURFACE WATER

- **Rivers:** All river stations presented in Figure 5 finished the month in either the normal (25<sup>th</sup> – 75<sup>th</sup> percentile) or above normal (75<sup>th</sup> – 100<sup>th</sup> percentile) flow ranges. Some of the river gages showed elevated flows at the end of August due to increased rainfall during Hurricane Idalia. River gages at the Fenholloway and Econfina ended the month in the above normal (75<sup>th</sup> – 90<sup>th</sup> percentile) category, while the Aucilla gage was in the high (>90<sup>th</sup> percentile) flow range at the end of August (Figure 6). Elsewhere, river gages in the District showed normal flow ranges at month's end.
- **Lakes:** Water levels decreased at most monitored lakes in the District this month (Figure 7). The median decrease in stage across all measured lakes was around 0.1' with six lakes concluding the month below their respective long-term average. Cherry Lake had the highest stage decrease of around 0.8' this month. As a note, a new data collection site has been established for Lake Alto and is currently awaiting an elevation survey before the data can be utilized in this report.
- **Springs:** Flow measurements were made during August at 18 springs by the U.S. Geological Survey (USGS), District staff, and contractors. Blue Hole had flows in the normal range throughout the month (Figure 8). Madison Blue Springs spent much of August in the above normal flow range before dropping into the normal flow range at the conclusion of the month (Figure 9).

## **GROUNDWATER**

Upper Floridan Aquifer (UFA) levels across the District reflected mainly normal or high (75<sup>th</sup> – 90<sup>th</sup> percentile) groundwater levels in August (Figure 10). A monitored well in Taylor County saw levels in the extremely high (>90<sup>th</sup> percentile) range at the end of the month. Overall, groundwater levels decreased by a median of about 0.2' since the end of July and ended August with a Districtwide average around the 59<sup>th</sup> percentile.

Many of the county index wells were higher than the historical monthly average levels at the end of August except for those in Suwannee, Hamilton, Lafayette, Union, and Dixie counties (Figure 11). Long-term District UFA well levels ended the month in either normal, high, or very high categories (Figure 12a). Long-term wells with records that extend back to at least 1964 showed mainly decreasing water levels this month (Figure 12b).

## **CLIMATE AND DROUGHT OUTLOOK**

The Climate Prediction Center has indicated that a continuation of El Niño conditions will continue through the winter with a greater than 95% chance of occurring from December 2023 to February 2024.

The NOAA three-month seasonal outlook favors above normal temperatures along with above normal precipitation throughout the District from September through November.

The U.S. Drought Monitor report released on September 7, 2023, shows no District counties with any drought conditions currently.

## **CONSERVATION**

Water conservation continues to be necessary to sustain healthy groundwater levels and flows in District springs and rivers. All users are urged to eliminate unnecessary uses. Landscape irrigation during Daylight Saving Time (March 12, 2023, to November 5, 2023) is limited to twice per week based on a District water conservation rule that applies to residential landscaping, public or commercial recreation areas, and businesses that are not regulated by a District-issued water use permit. Information about SRWMD's year-round conservation measures is available at <http://www.srwmd.org/index.aspx?NID=337>.

## **ACKNOWLEDGMENTS**

The Hydrologic Conditions Report is a monthly combined effort between the Offices of Water Resources and Hydrologic Data Services data collection and review programs. Acknowledgment is made to the following staff for their contributions to the timely production of this report:

- Data Collection: Jamie Gaylord, Matthew Jordan, Dylan Mock, Gene Page, and Vince Robinson
- QA/QC and Reporting: Stephanie Armstrong, Alejandro Arteaga Garcia, Susie Hetrick, Robbie McKinney, and Brandi Sistrunk
- Administrative Support/Document Preparation/IT: Paul Buchanan, Tyler Jordan, Andrew Neel, and April Olive

*This report is compiled in compliance with Chapter 40B-21.211, Florida Administrative Code, using rainfall (gage-adjusted radar-derived estimates), groundwater (121 wells), surface water (35 stations), and general information such as drought indices and forecasts. Data are provisional and updated as revised data become available. Data are available at <http://www.mysuwanneeriver.com/507/Water-Data-Portal> or upon request.*

**Table 1:** Nexrad Monthly Rainfall Totals by County (inches)

County	August 2023	August Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal*
Alachua	5.27	7.53	70%	47.79	91%
Baker	5.47	7.21	76%	45.71	87%
Bradford	7.43	7.18	104%	49.33	95%
Columbia	5.76	7.04	82%	45.54	86%
Dixie	8.22	9.34	88%	52.97	91%
Gilchrist	6.25	8.02	78%	47.32	87%
Hamilton	7.89	6.34	124%	48.11	93%
Jefferson	7.71	6.77	114%	49.84	89%
Lafayette	6.84	7.95	86%	52.15	94%
Levy	6.13	9.12	67%	47.73	85%
Madison	8.15	6.50	125%	54.32	102%
Suwannee	6.86	6.98	98%	48.94	92%
Taylor	7.63	8.29	92%	53.62	94%
Union	6.64	7.21	92%	45.76	87%

\*Based on PRISM LT81 monthly rainfall averages by county (1927-2021)

August 2022 District Average	7.07
August Long-Term Average (1932-2022)	7.61
Historical 12-month Average (1932-2022)	54.66
Past 12-Month Total	49.96
12-Month Rainfall <b>Surplus/Deficit</b>	<b>-4.70</b>

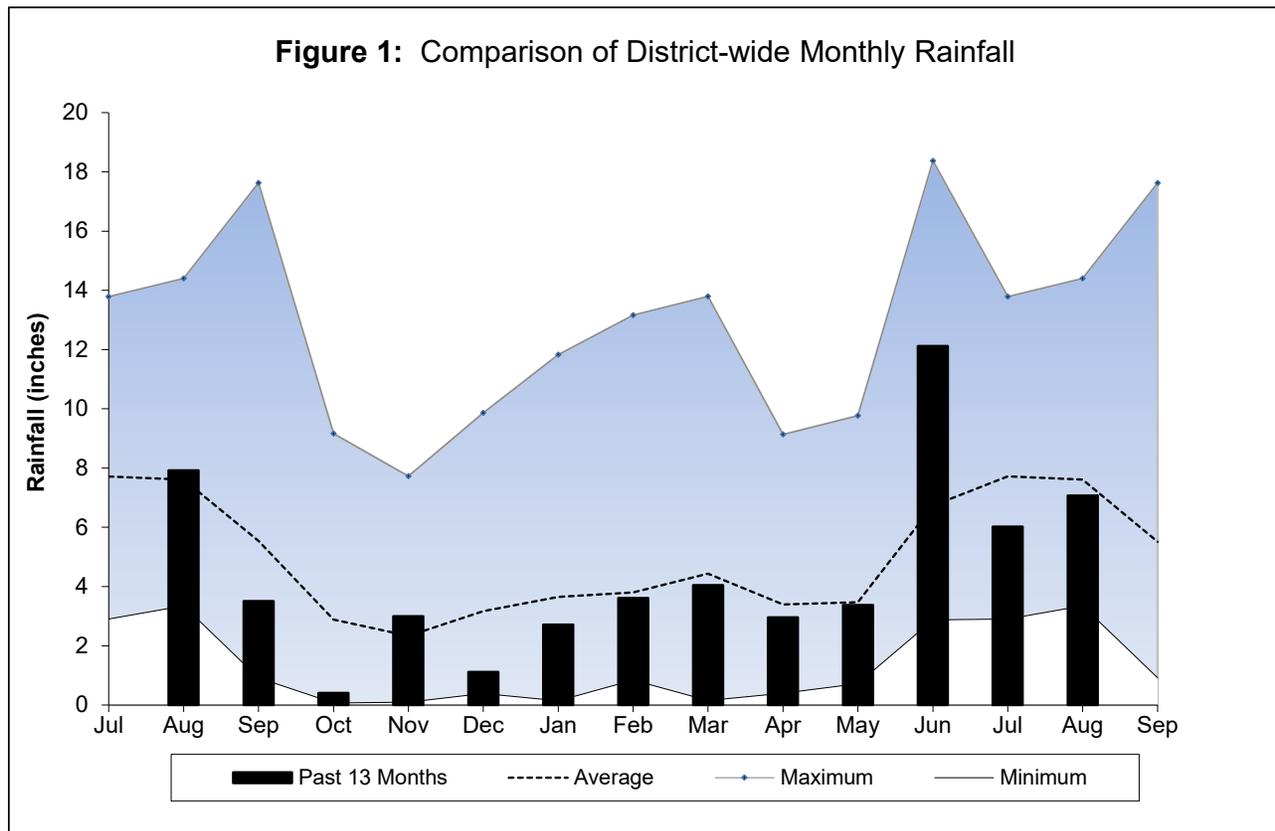
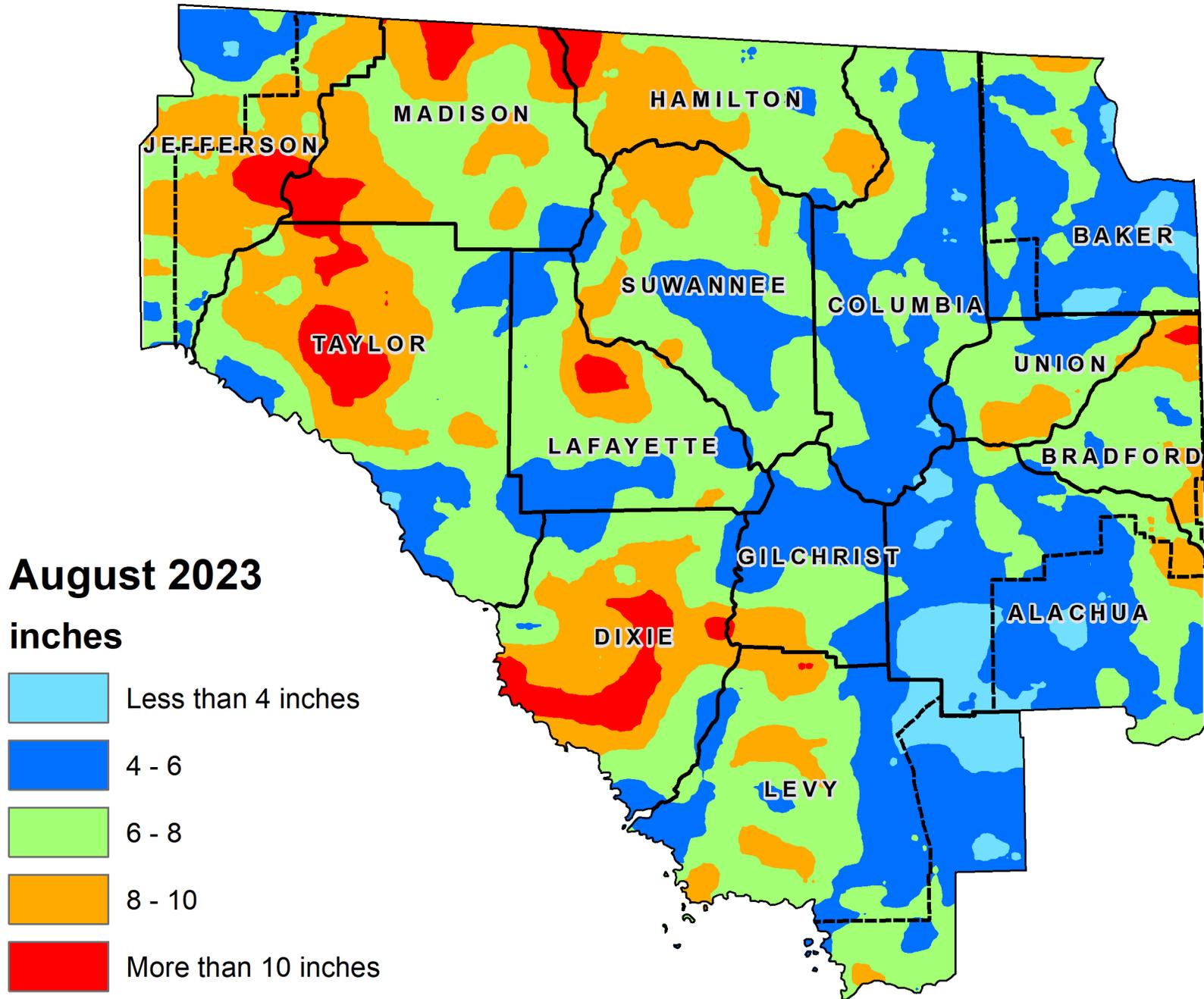
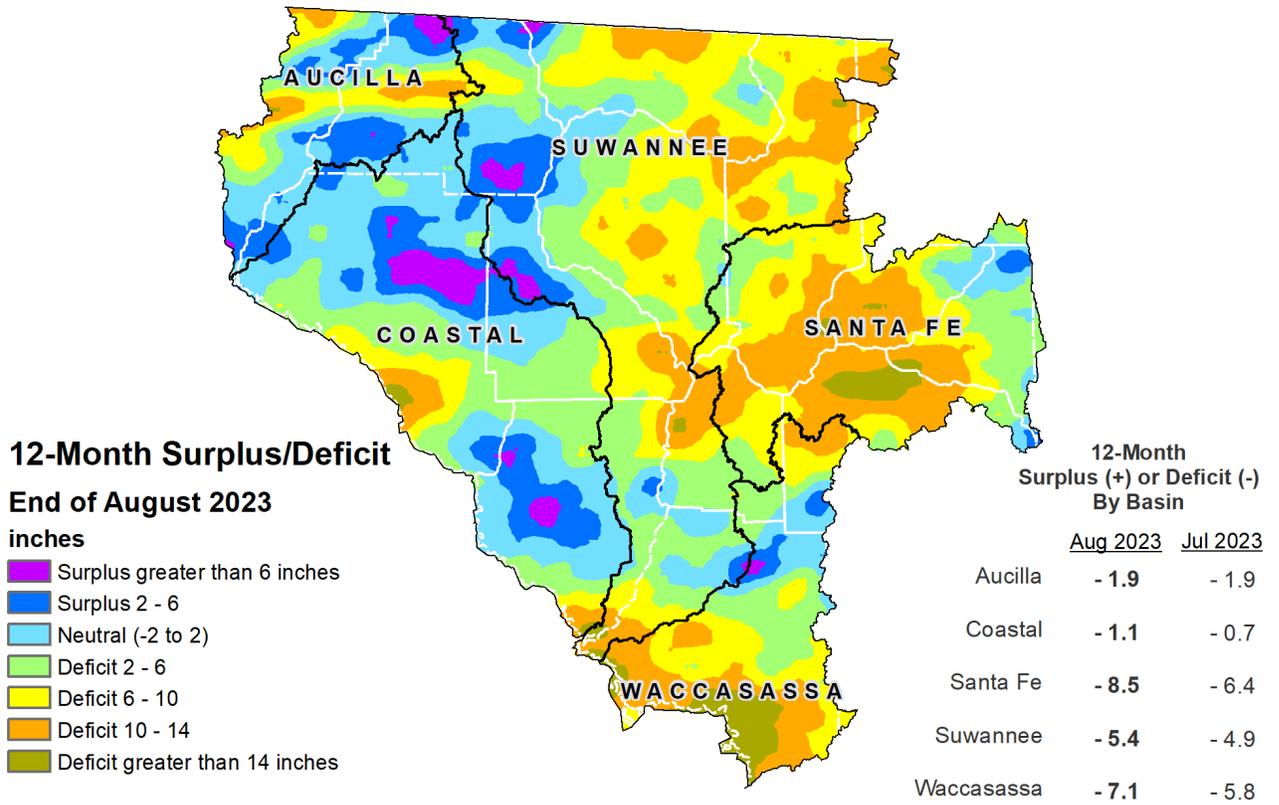


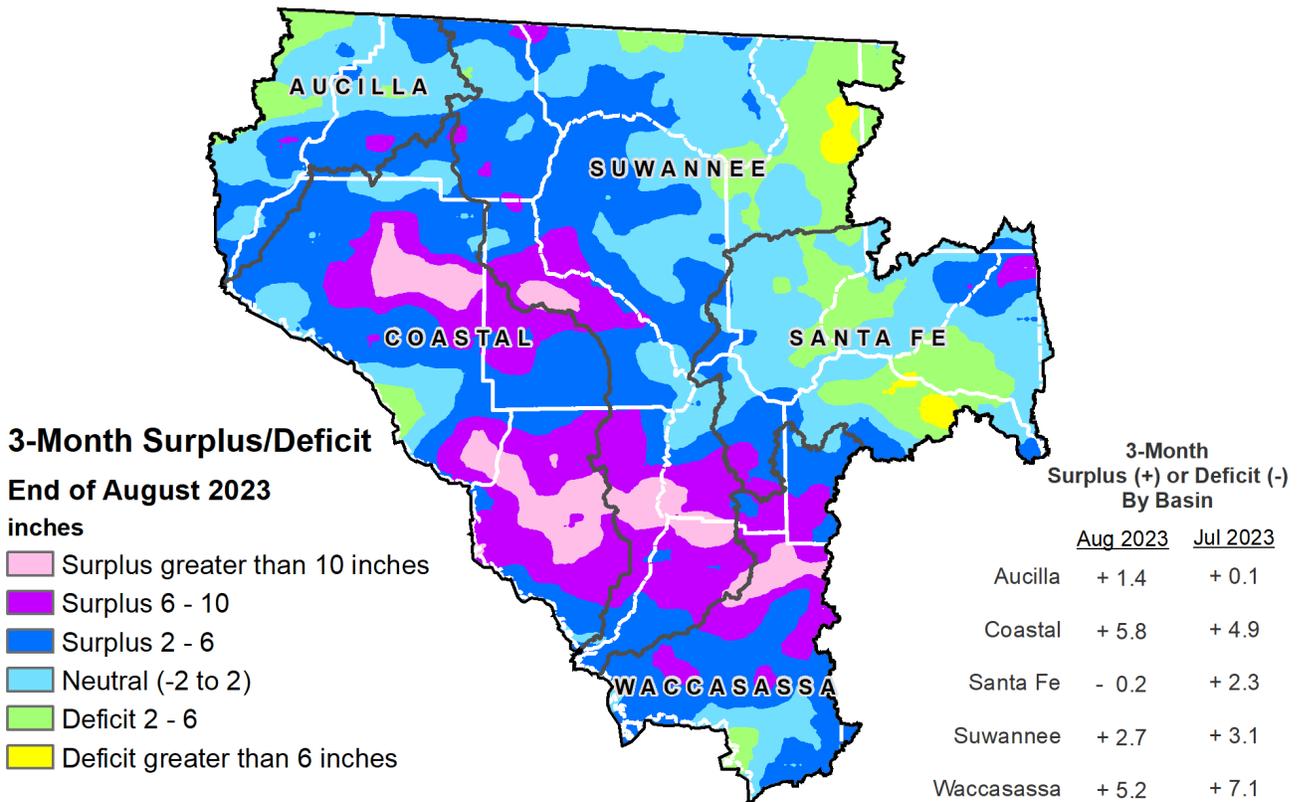
Figure 2: August 2023 SRWMD Gage-adjusted Radar Rainfall



**Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through August 31, 2023**

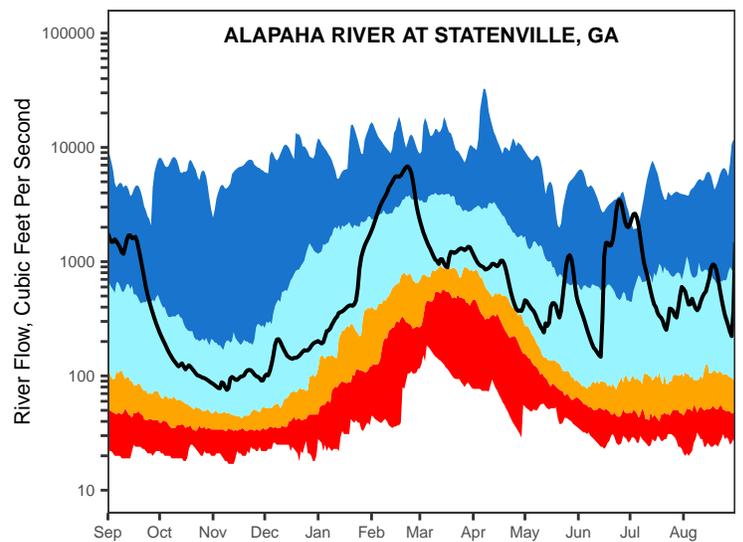
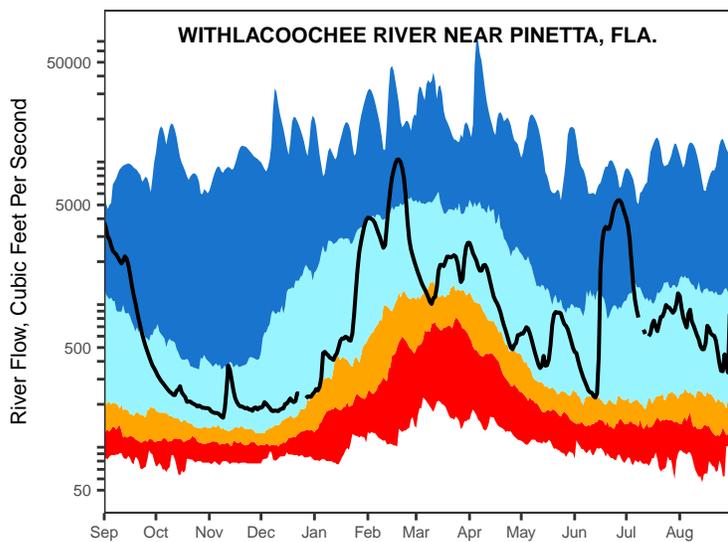
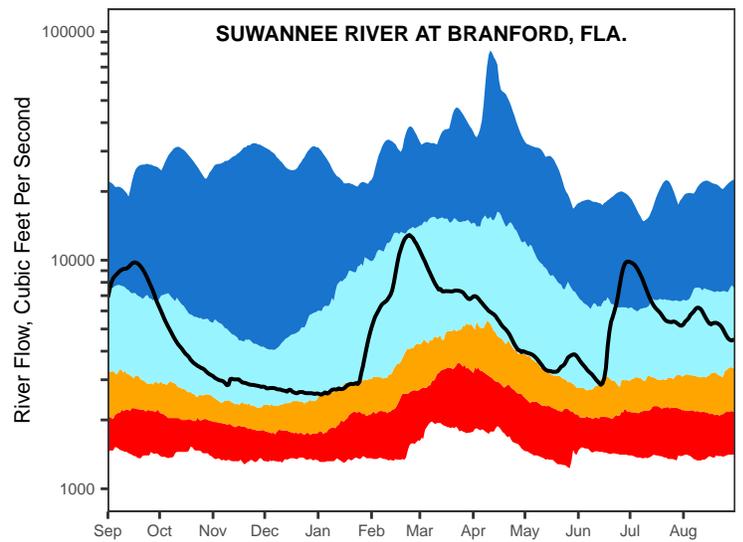
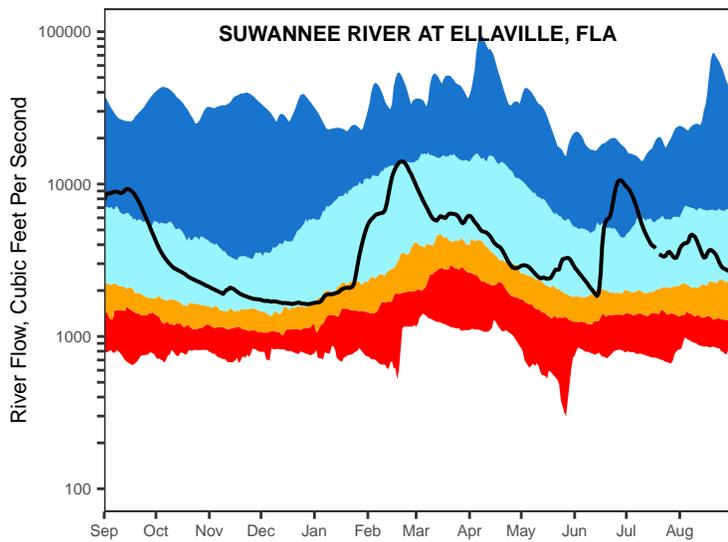
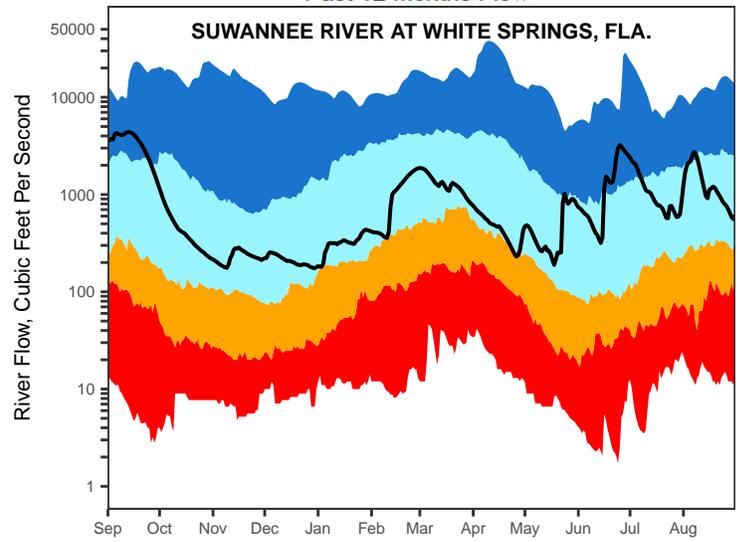
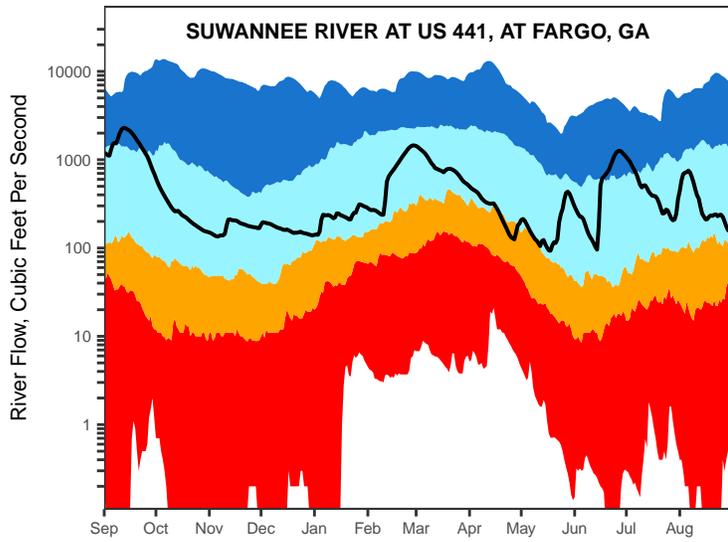
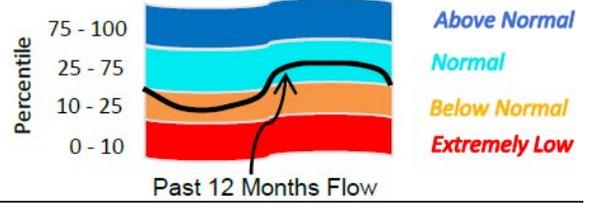


**Figure 4: 3 - Month Rainfall Surplus/Deficit by River Basin through August 31, 2023**



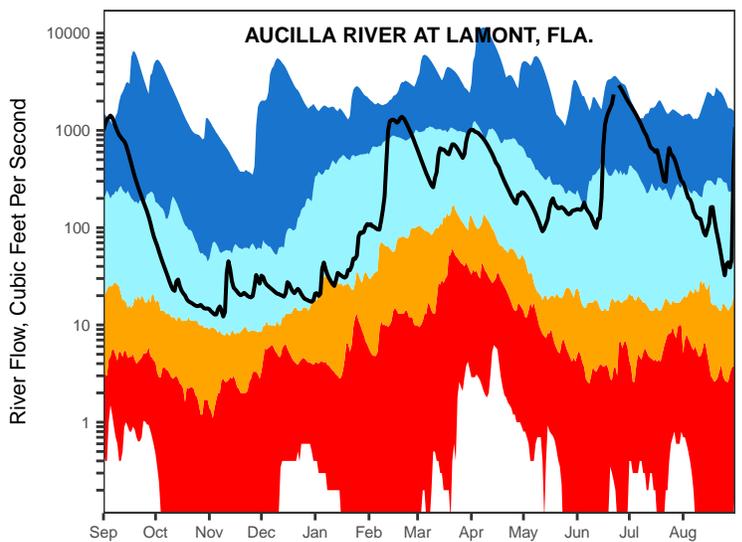
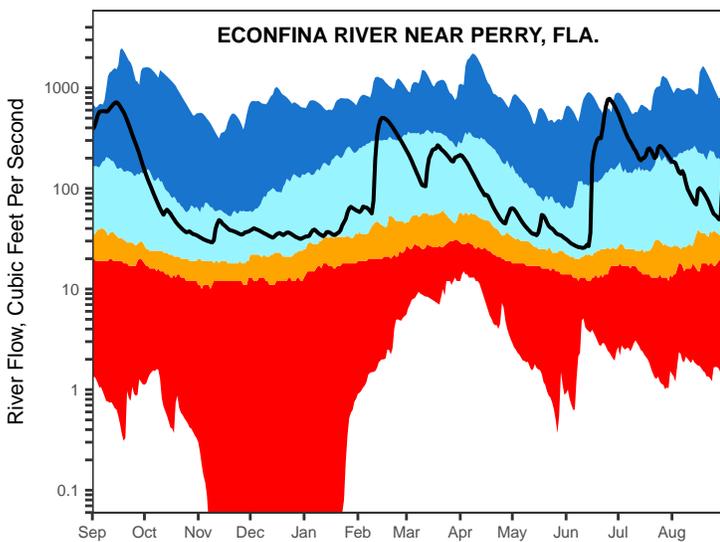
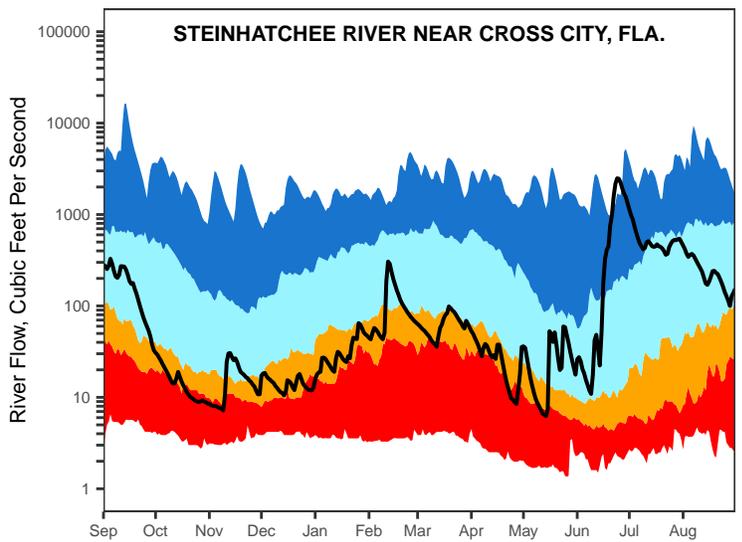
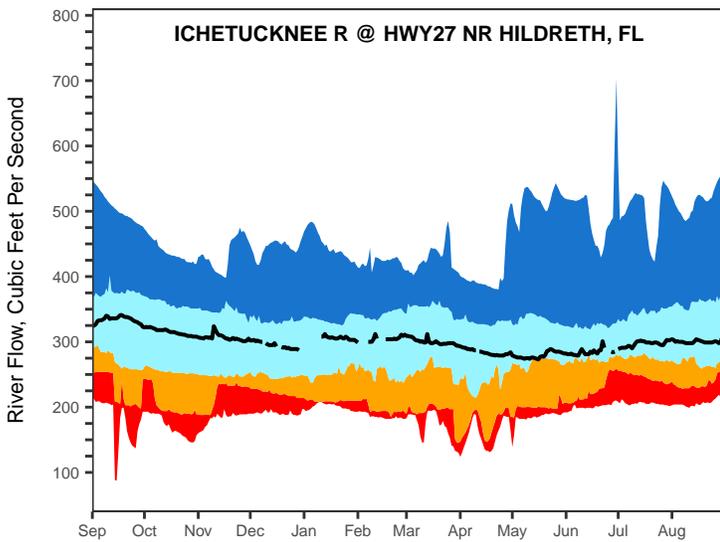
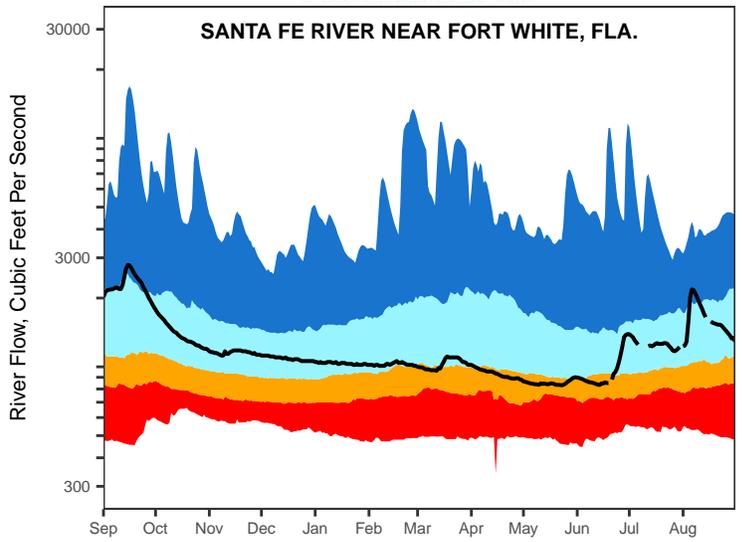
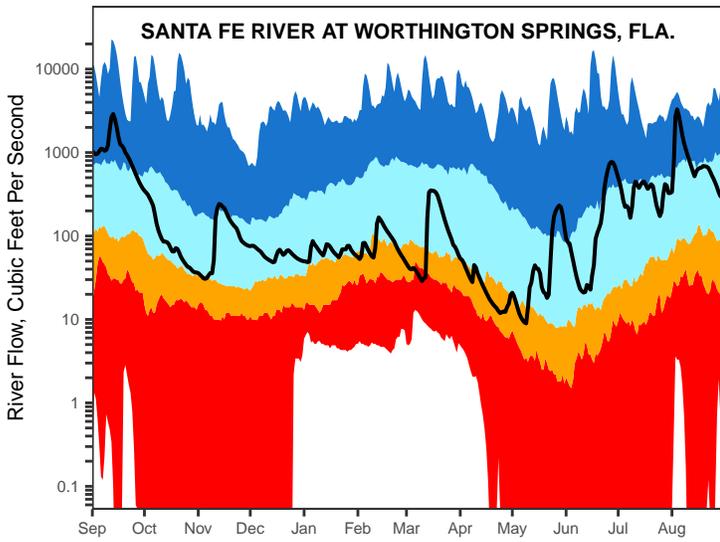
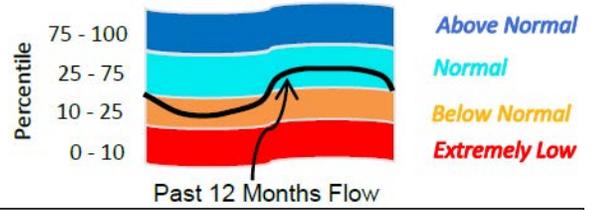
# Figure 5: Daily River Flow Statistics

September 1, 2022 through August 31, 2023



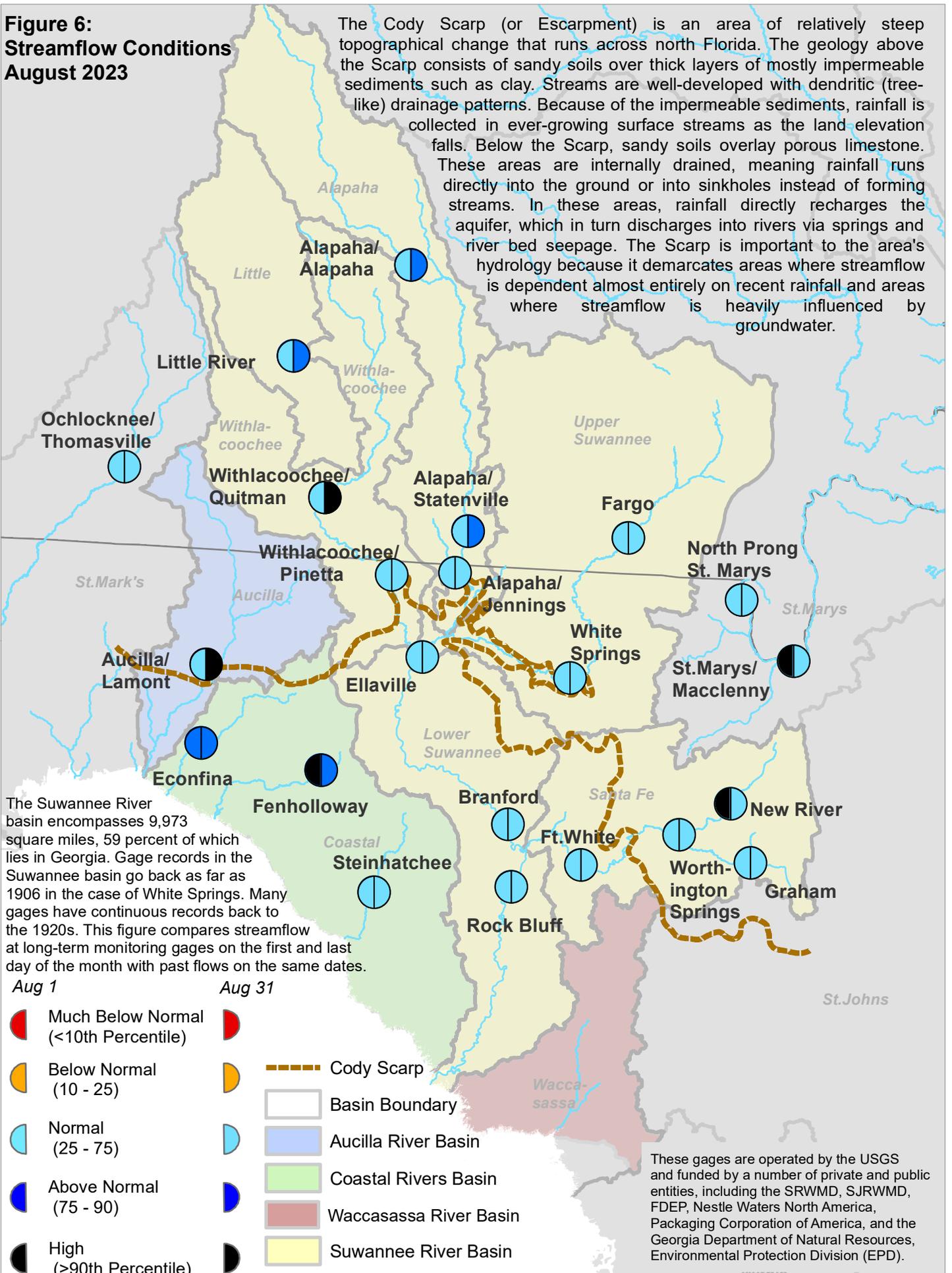
# Figure 5, cont.: Daily River Flow Statistics

September 1, 2022 through August 31, 2023



**Figure 6:  
Streamflow Conditions  
August 2023**

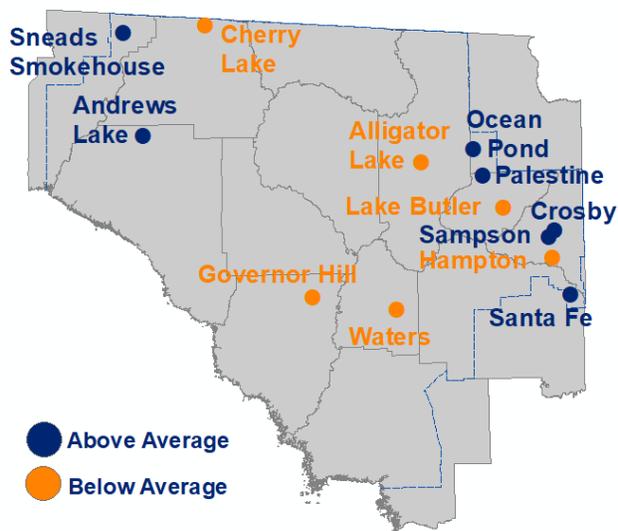
The Cody Scarp (or Escarpment) is an area of relatively steep topographical change that runs across north Florida. The geology above the Scarp consists of sandy soils over thick layers of mostly impermeable sediments such as clay. Streams are well-developed with dendritic (tree-like) drainage patterns. Because of the impermeable sediments, rainfall is collected in ever-growing surface streams as the land elevation falls. Below the Scarp, sandy soils overlay porous limestone. These areas are internally drained, meaning rainfall runs directly into the ground or into sinkholes instead of forming streams. In these areas, rainfall directly recharges the aquifer, which in turn discharges into rivers via springs and river bed seepage. The Scarp is important to the area's hydrology because it demarcates areas where streamflow is dependent almost entirely on recent rainfall and areas where streamflow is heavily influenced by groundwater.



The Suwannee River basin encompasses 9,973 square miles, 59 percent 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 1920s. This figure compares streamflow at long-term monitoring gages on the first and last day of the month with past flows on the same dates.

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 Protection Division (EPD).

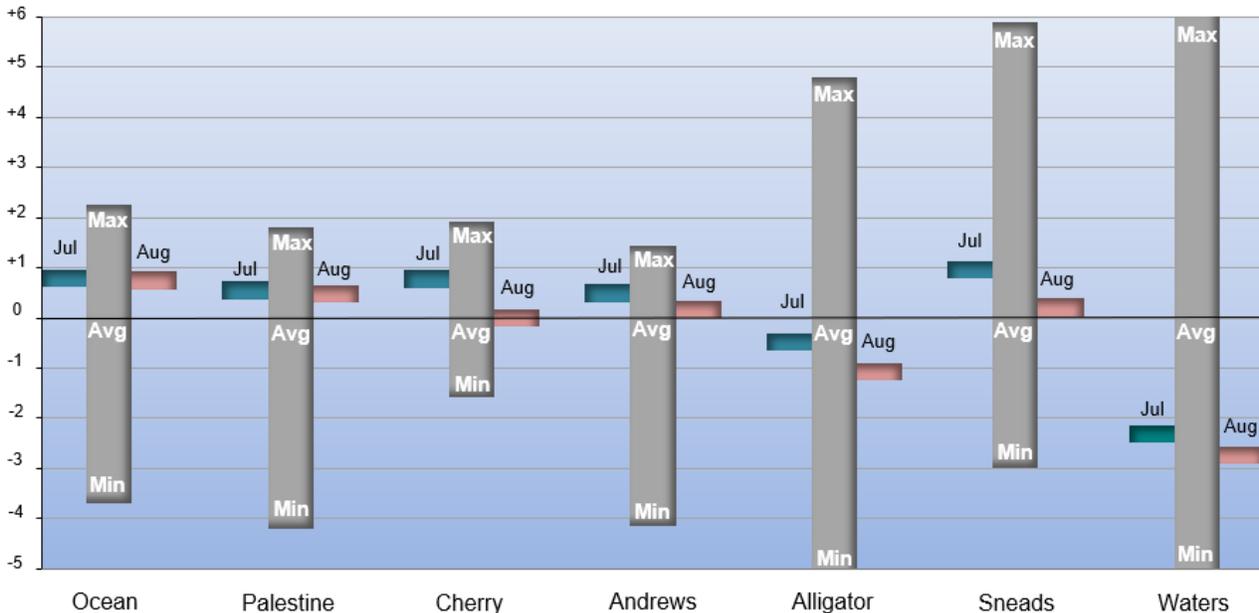
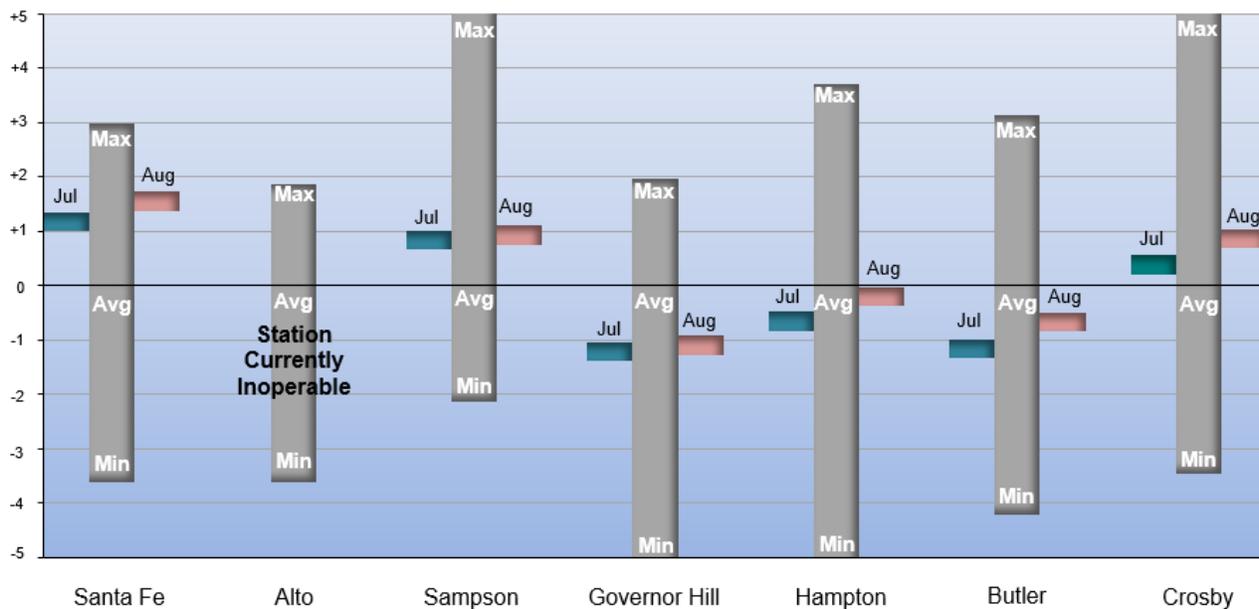
**Figure 7: August 2023 Lake Levels**



SRWMD lakes react differently to climatic changes depending on their location in the landscape. Some lakes, in particular 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 currently monitors 14 lakes on a long-term basis; much of the data was originally provided by volunteer observers. Monitoring records began in the 1970s, except for Lakes Butler, Sampson, and Santa Fe, which started in 1957.

Feet Above or Below Historic Average



**Figure 8:** Flow Over the Past 12 Months, Blue Hole (cubic feet per second)

Note: This graph is based on provisional data that are subject to revision

Period 12 Month 09/01/2022 to 09/01/2023

2022-23

Percentile statistics are calculated using data from 05/01/1946 to 09/30/2022

Blue Hole

■ Max-Q75

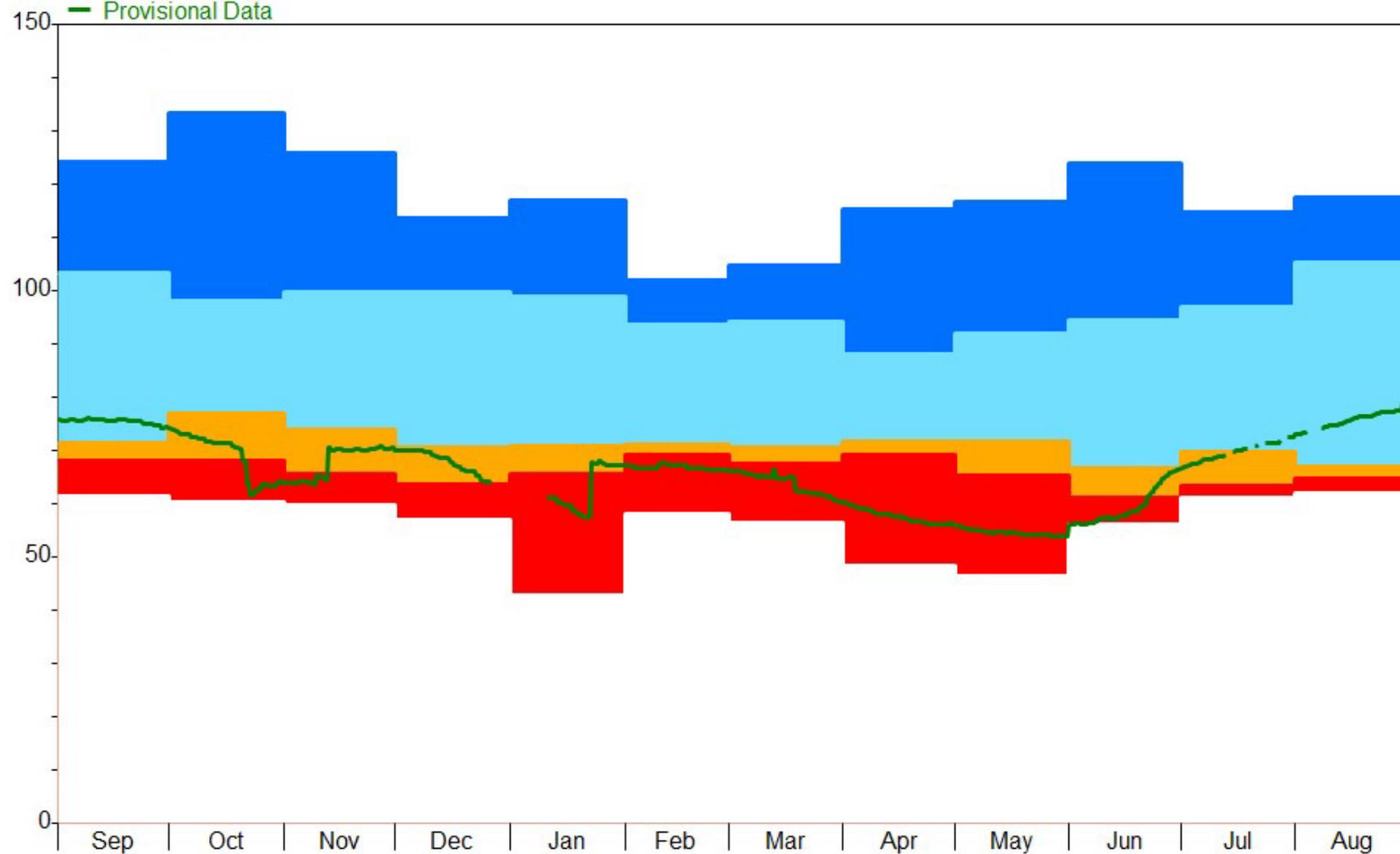
■ Q75-Q25

■ Q25-Q10

■ Q10-Min

— Archived Data

— Provisional Data



**Figure 9:** Flow Over the Past 12 Months, Madison Blue Springs (cubic feet per second)

Note: This graph is based on provisional data that are subject to revision

Period 12 Month 09/01/2022 to 09/01/2023

2022-23

Percentile statistics are calculated using data from 03/01/1932 to 09/30/2022

Madison Blue

■ Max-Q75

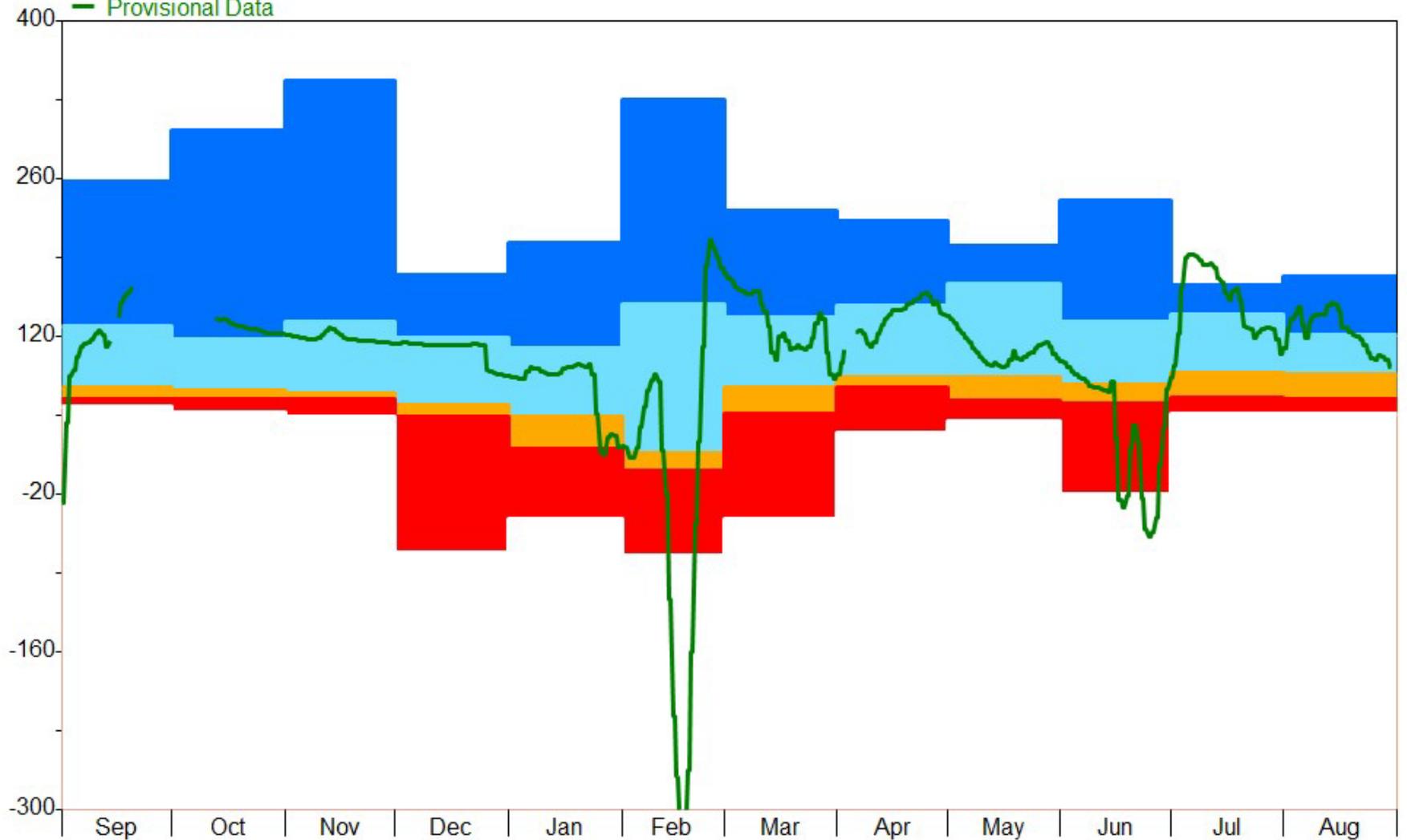
■ Q75-Q25

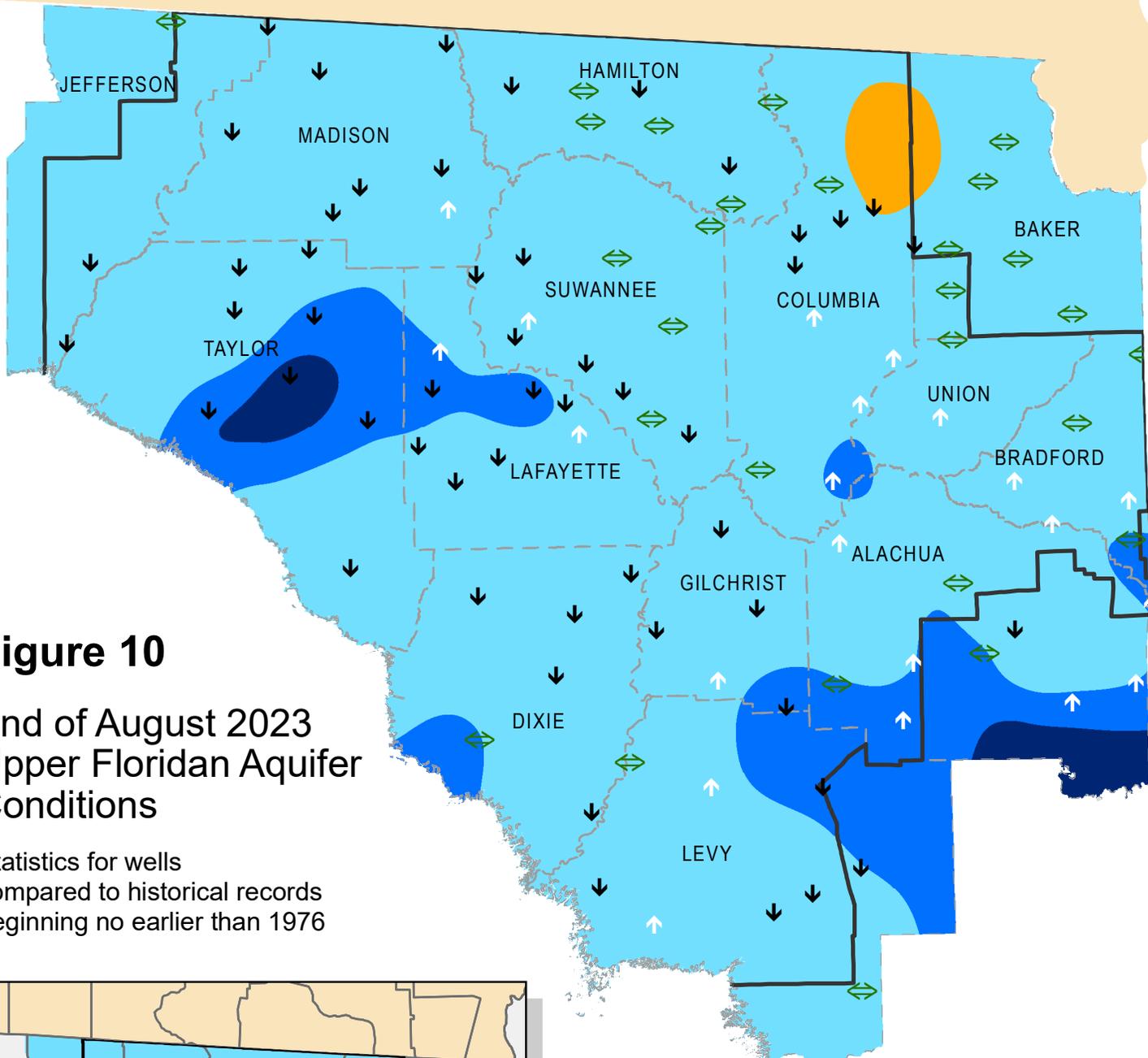
■ Q25-Q10

■ Q10-Min

— Archived Data

— Provisional Data

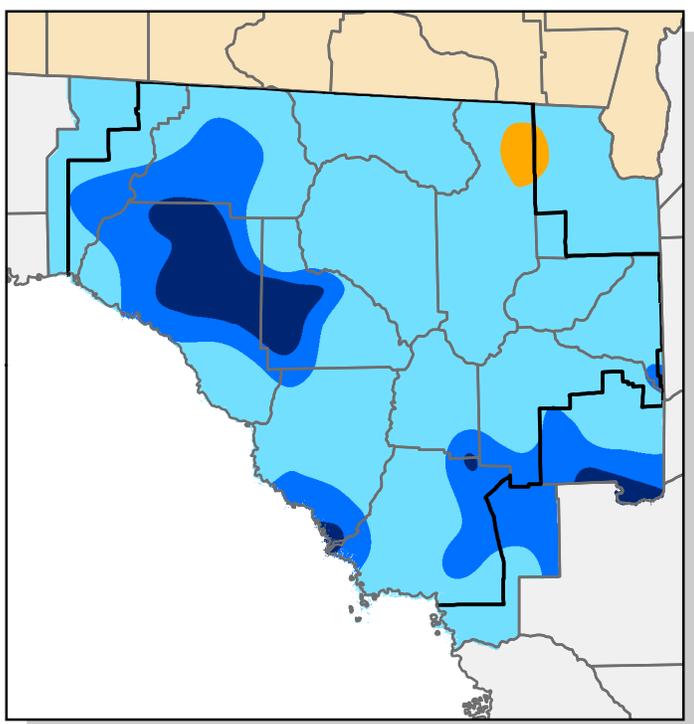




# Figure 10

## End of August 2023 Upper Floridan Aquifer Conditions

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



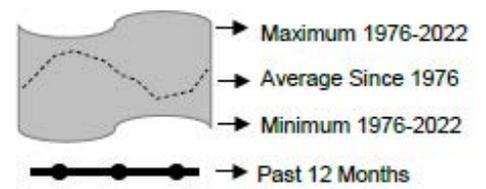
Inset: July Groundwater Percentiles

Additional wells courtesy of SJRWMD, SWFWMD and USGS

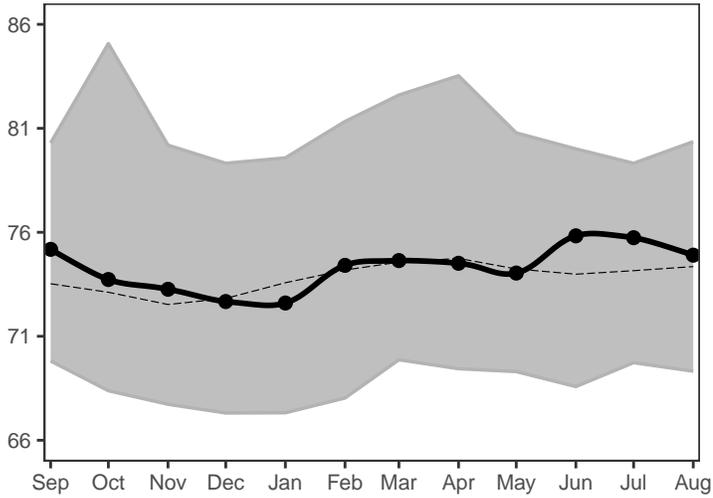
- Extremely High  
(Greater than 90th Percentile)
- High  
(75th to 90th Percentile)
- Normal  
(25th to 75th Percentile)
- Low  
(10th to 25th Percentile)
- Extremely Low  
(Less than 10th Percentile)
- ↑ ↓ Increase/decrease in level since last month
- ↔ Increase/decrease since last month less than one percent of historic range
- District Boundary

# Figure 11: Monthly Groundwater Statistics

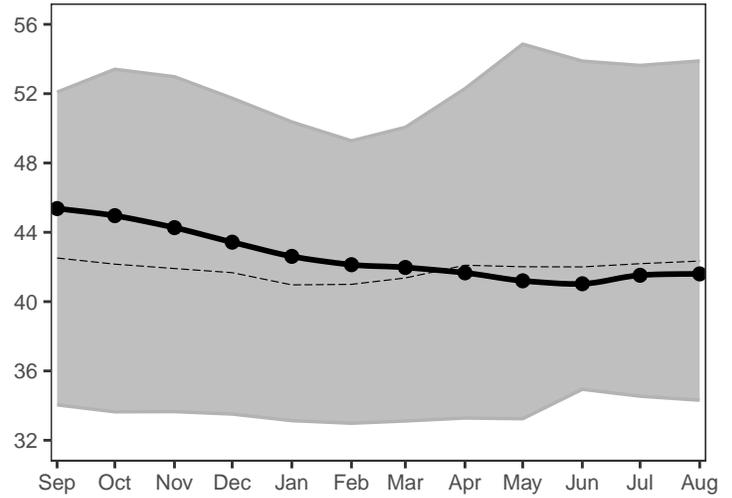
Levels September 2022 through August 2023  
 Period of Record Beginning 1976



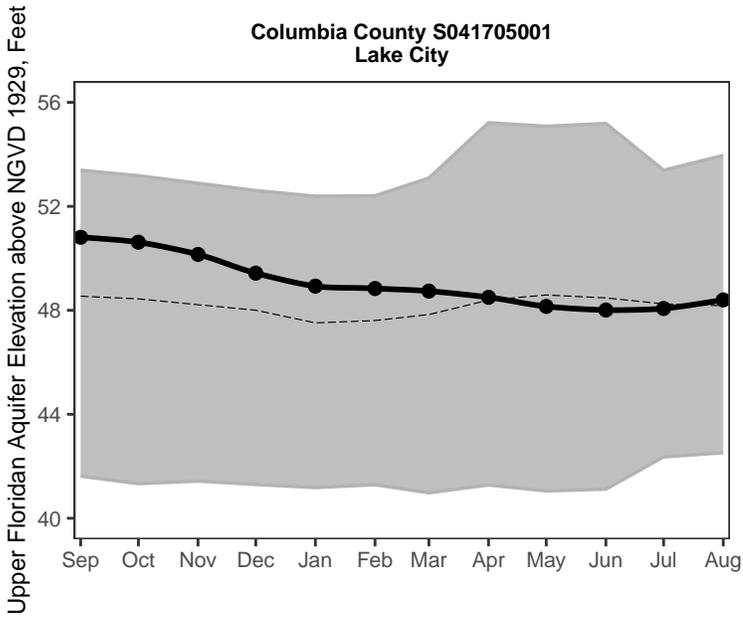
**Madison County N010719001**  
near Greenville



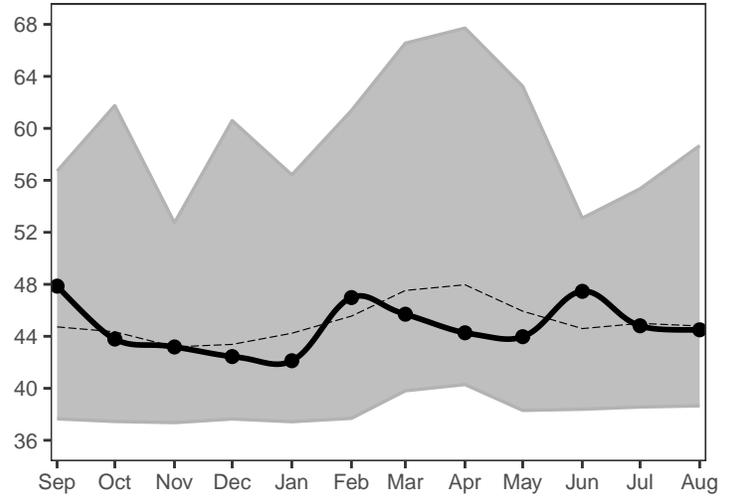
**Suwannee County S021335001**  
near Live Oak



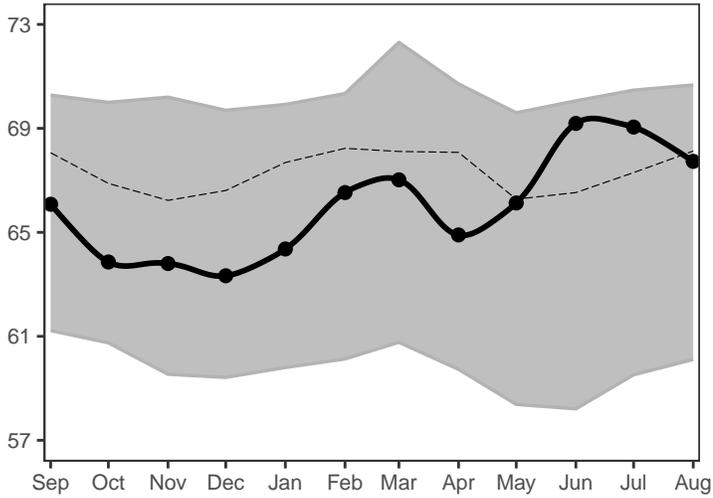
**Columbia County S041705001**  
Lake City



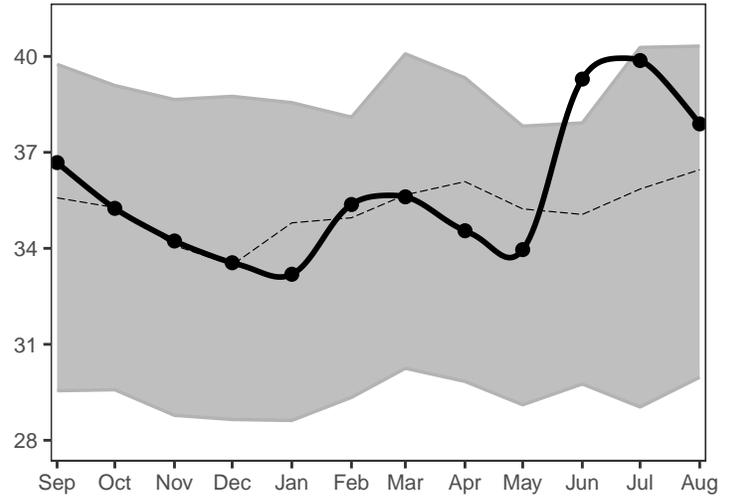
**Hamilton County N011422007**  
near Jasper



**Lafayette County S061114001**  
near Mayo

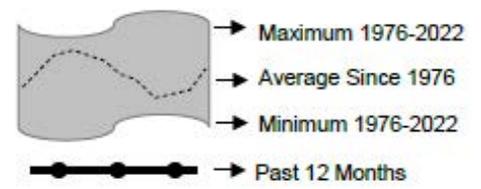


**Taylor County S040736005**  
Perry

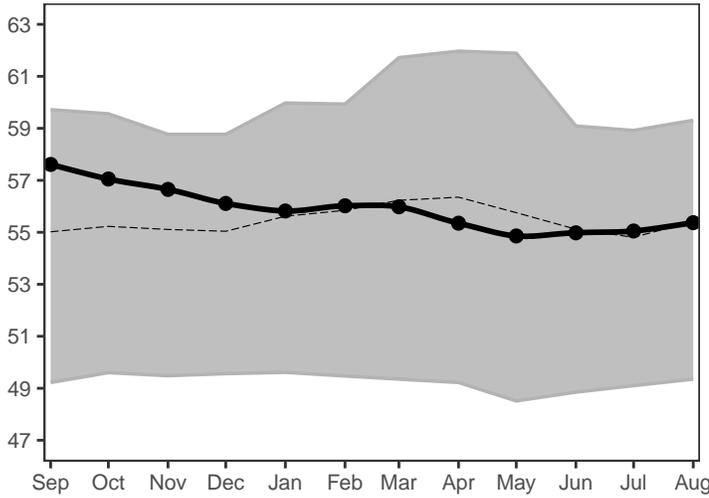


# Figure 11, cont.: Monthly Groundwater Statistics

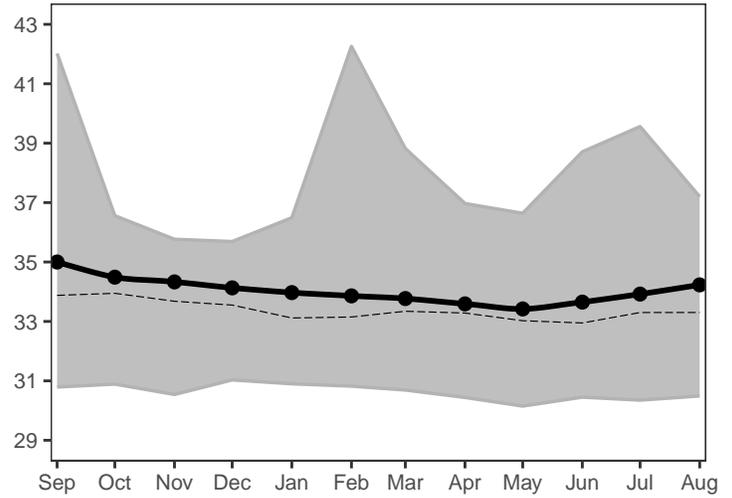
Levels September 2022 through August 2023  
 Period of Record Beginning 1976



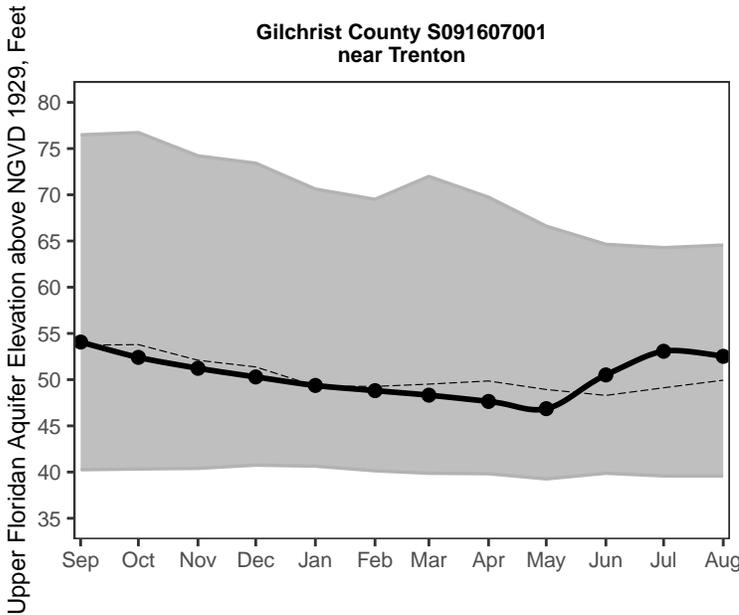
**Union County S051933001**  
near Lake Butler



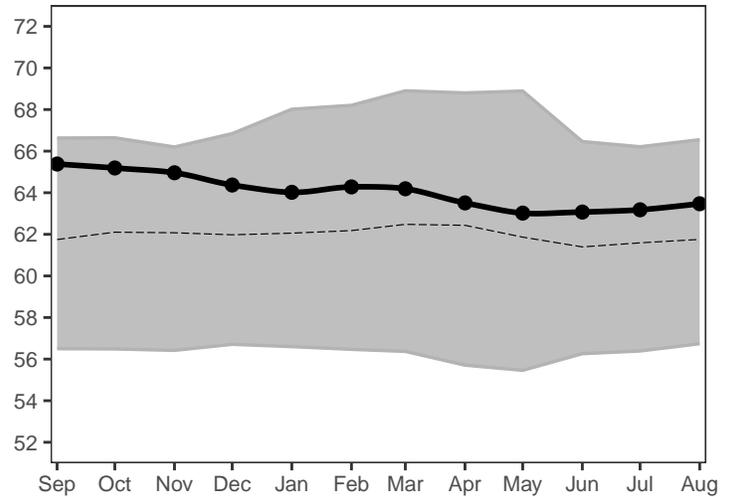
**Alachua County S081703001**  
at High Springs



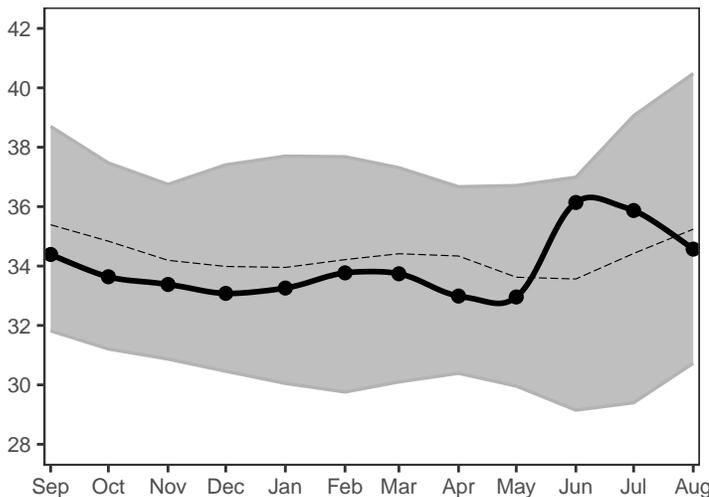
**Gilchrist County S091607001**  
near Trenton



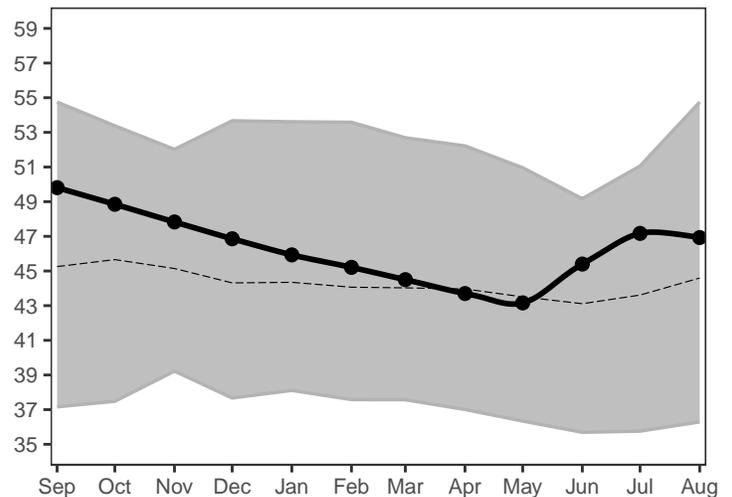
**Bradford County S072132001**  
near Graham

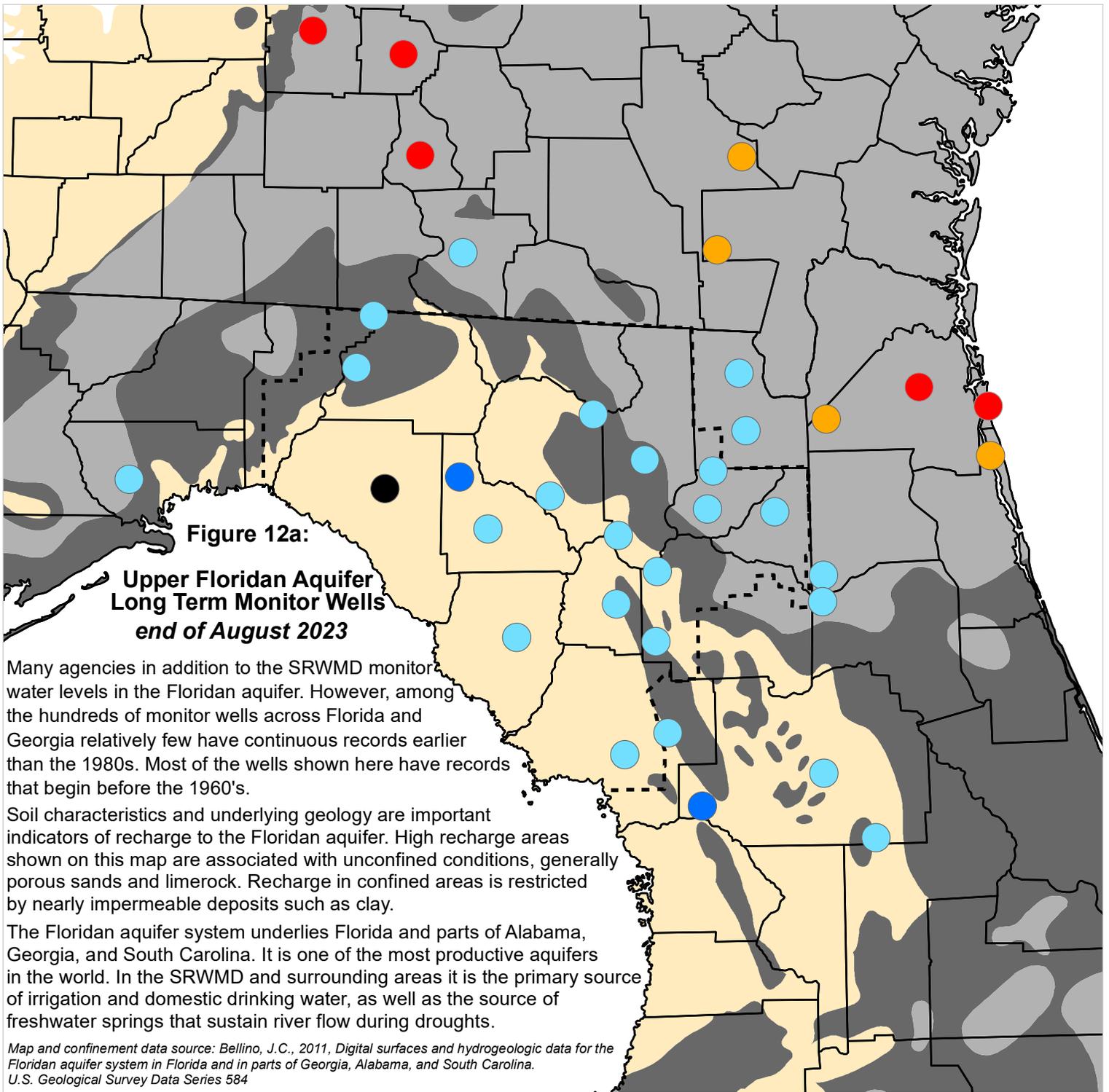


**Dixie County S101210001**  
at Cross City



**Levy County S131736001**  
near Bronson





**Occurrence of Confined and Unconfined Conditions in the Upper Floridan Aquifer**

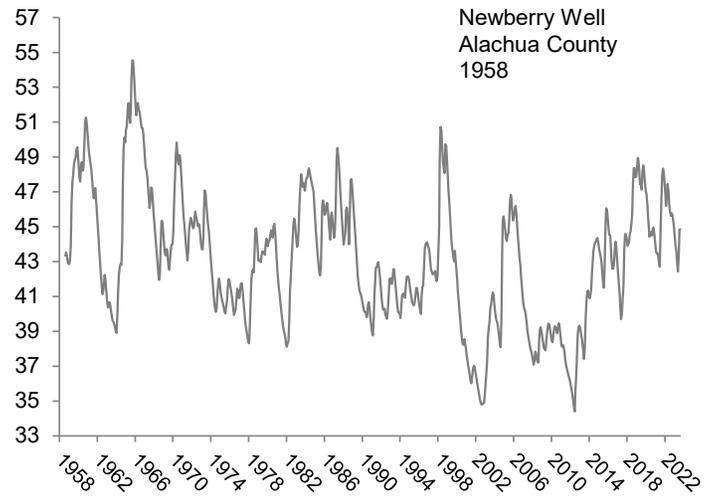
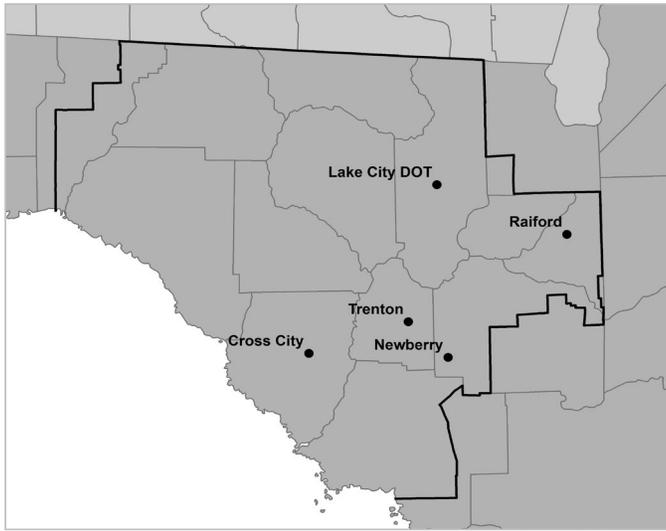
-  Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
-  Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
-  Unconfined: Upper confining unit is absent or very thin. Recharge is high.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

**Percentile of Most Recent Water Level Relative to Entire Record**

-  Very High (Greater than 90th Percentile)
-  High (75th to 90th Percentile)
-  Normal (25th to 75th Percentile)
-  Low (10th to 25th Percentile)
-  Very Low (Less than 10th Percentile)
-  Data Not Available

# Figure 12b: Regional Long Term Upper Floridan Aquifer Levels

Data through August 2023



Upper Floridan Aquifer Elevation above NGVD 1929, Feet

