

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: June 30, 2023

RE: June 2023 Hydrologic Conditions Report

RAINFALL

- Districtwide average rainfall for the month was 12.12", which was about 80% higher than the 1932-2022 average of 6.74" (Table 1, Figure 1). The 12-month period ending June 30 reflected a Districtwide rainfall deficit of 1.82", which was a major improvement in the 9.37" deficit seen at the end of May. Most District counties received between 7" and 16" of rainfall on average with areas of Dixie, Taylor, Levy, and Alachua counties receiving more than 19" of rainfall (Figure 2).
- A 12-month rainfall deficit was still present for many river basins, with each showing an ameliorated deficit by the end of June (Figure 3). Both the Aucilla and Coastal basins had surpluses at month's end. Most basins contained areas with surpluses of greater than 10", and each basin had parts with greater than 10" deficits at the end of June. All the river basins showed 3-month surpluses, with three of the basins transitioning from deficit to surplus at the end of the month (Figure 4). Areas within every basin except the Aucilla showed surpluses greater than 10" at the end of June due to increased rainfall amounts in those areas over the past month. The Aucilla and Waccasassa basins also had areas with deficits of greater than 2" at the end of the month.

SURFACE WATER

- **Rivers:** Each of the river stations presented in Figure 5 finished the month in the normal (25th – 75th percentile) or above normal (75th – 100th percentile) flow ranges. These monitored river gages saw a rise in flow due to an increase in rainfall during the final weeks of June. Both the Econfina and Steinhatchee gages had 5 consecutive days of daily record highs during the latter part of the month. Two Santa Fe River gages (Graham and Ft. White) ended the month in the normal flow range and were the only two monitored gages in the District not showing above normal or high flows (Figure 6).
- **Lakes:** Water levels increased at most monitored lakes in the District this month (Figure 7). The median increase in stage across all measured lakes was around 0.7'. Alligator Lake had the highest stage increase of around 1.8' this month. Five of the lakes, however, concluded the month below their respective long-term averages. 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 June at 14 springs by the U.S. Geological Survey (USGS), District staff, and contractors. The Wacissa River improved from low to normal flows (Figure 8), while Lafayette Blue Springs had flow reversals due to elevated river levels during the month of June (Figure 9).

GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District reflected mainly normal or high (75th – 90th percentile) groundwater levels in June (Figure 10). Portions of Jefferson, Lafayette, Taylor, Dixie, Levy, and Gilchrist counties also saw levels in the extremely high (>90th percentile) range at the end of the month. Overall, groundwater levels increased by a median of about 1.2' since the end of May and ended June with a Districtwide average around the 63rd percentile.

Many of the county index wells were higher than the historical monthly average levels at the end of June except for those in Suwannee, Columbia, and Union counties (Figure 11). Most of the long-term District UFA well levels ended the month in either the low (10th – 25th percentile), normal, or very high categories (Figure 12a). Long-term wells with records that extend back to at least 1964 showed mainly increasing water levels this month (Figure 12b).

CLIMATE AND DROUGHT OUTLOOK

The Climate Prediction Center has indicated El Niño is currently present and is expected to gradually strengthen through the winter of 2023-24.

The NOAA three-month seasonal outlook favors above normal temperatures along with equal chances of normal or below normal precipitation throughout the District from July through September.

The U.S. Drought Monitor report released on July 6, 2023, shows no drought conditions currently present within the District.

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	June 2023	June Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal*
Alachua	12.52	6.98	179%	51.74	98%
Baker	7.43	6.81	109%	48.25	91%
Bradford	7.11	6.64	107%	48.71	94%
Columbia	9.00	6.89	131%	51.00	96%
Dixie	16.34	7.30	224%	56.09	96%
Gilchrist	15.31	7.18	213%	50.27	92%
Hamilton	9.47	6.38	148%	48.20	93%
Jefferson	9.14	6.18	148%	51.83	93%
Lafayette	13.73	6.68	206%	54.36	98%
Levy	14.23	7.50	190%	52.64	93%
Madison	11.77	6.22	189%	58.28	109%
Suwannee	11.43	6.50	176%	49.25	93%
Taylor	13.19	6.66	198%	55.52	98%
Union	8.01	6.88	117%	48.05	91%

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

June 2022 District Average	12.12
June Long-Term Average (1932-2022)	6.74
Historical 12-month Average (1932-2022)	54.66
Past 12-Month Total	52.84
12-Month Rainfall Surplus/Deficit	-1.82

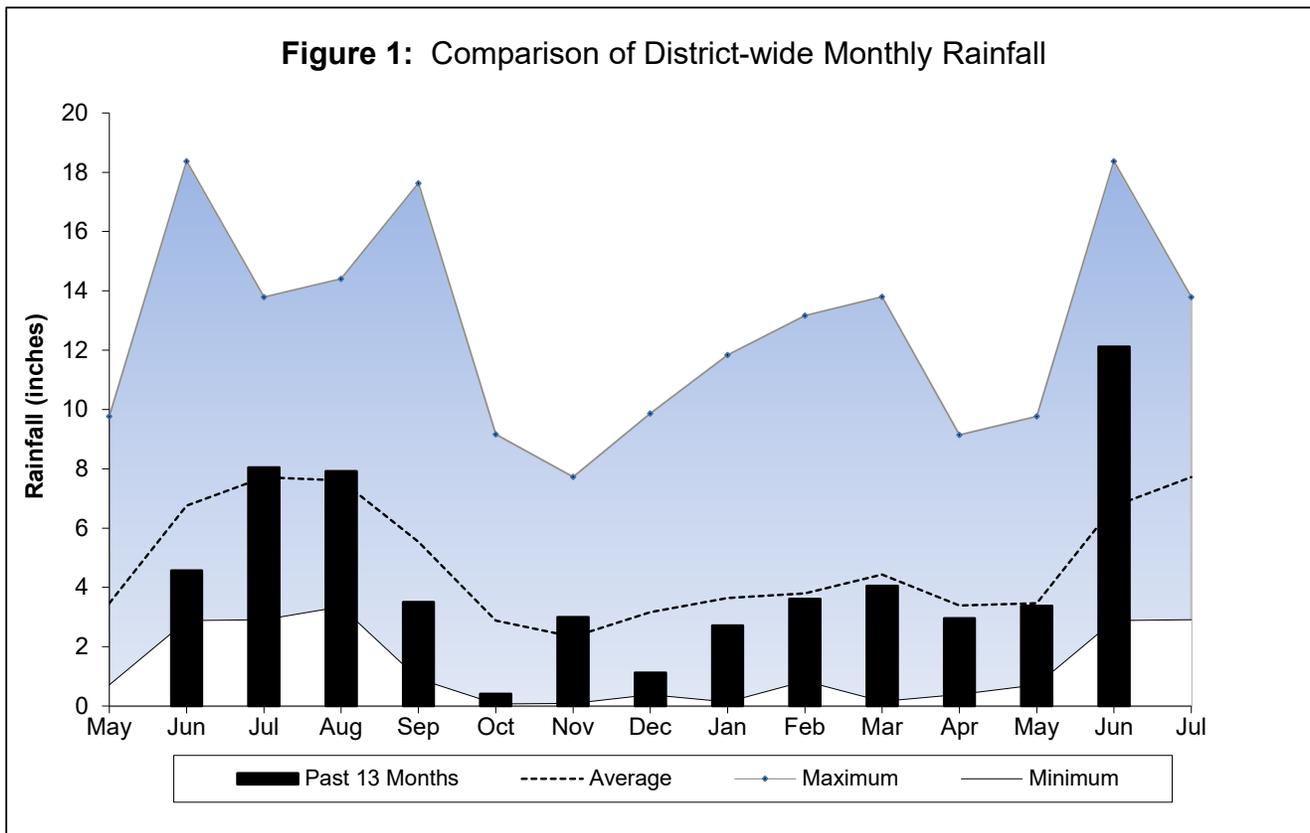


Figure 2: June 2023 SRWMD Gage-adjusted Radar Rainfall

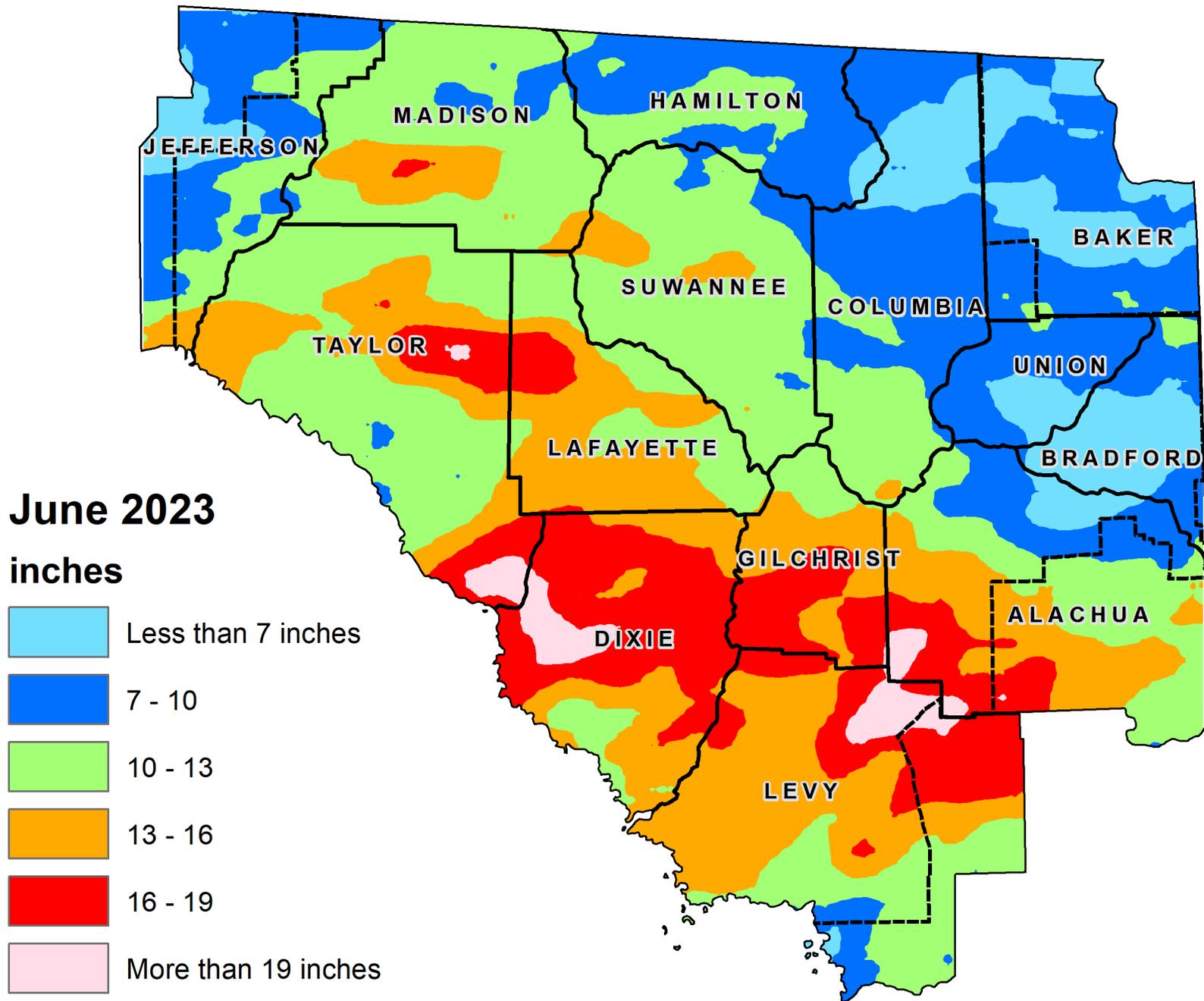


Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through June 30, 2023

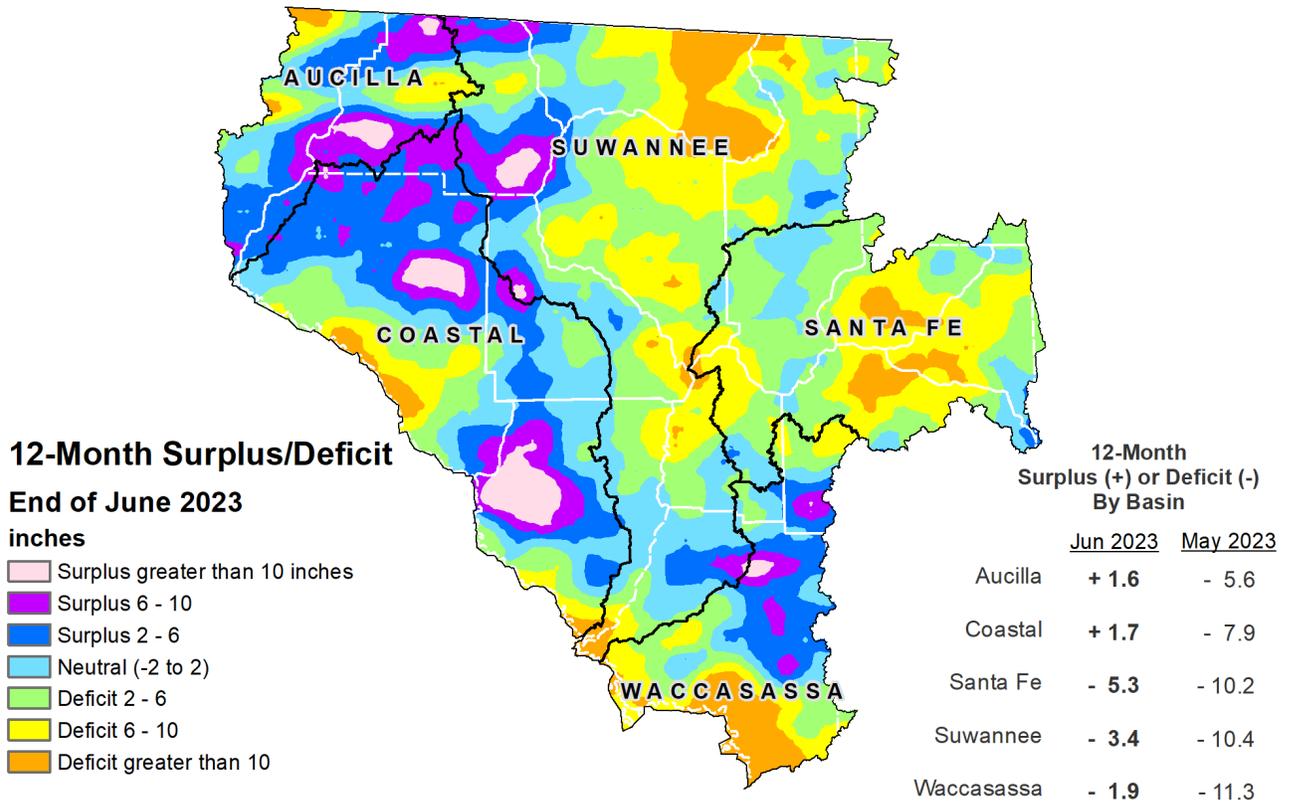


Figure 4: 3 - Month Rainfall Surplus/Deficit by River Basin through June 30, 2023

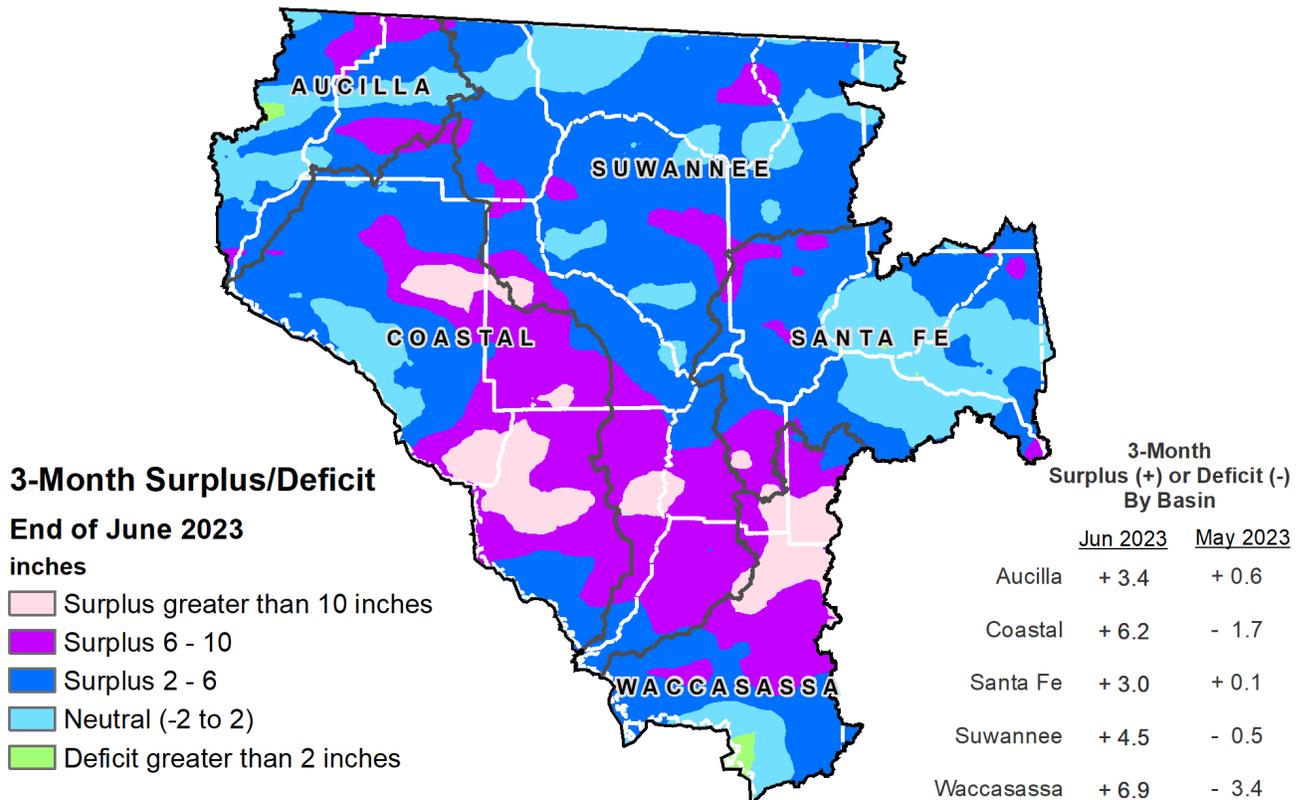


Figure 5: Daily River Flow Statistics

July 1, 2022 through June 30, 2023

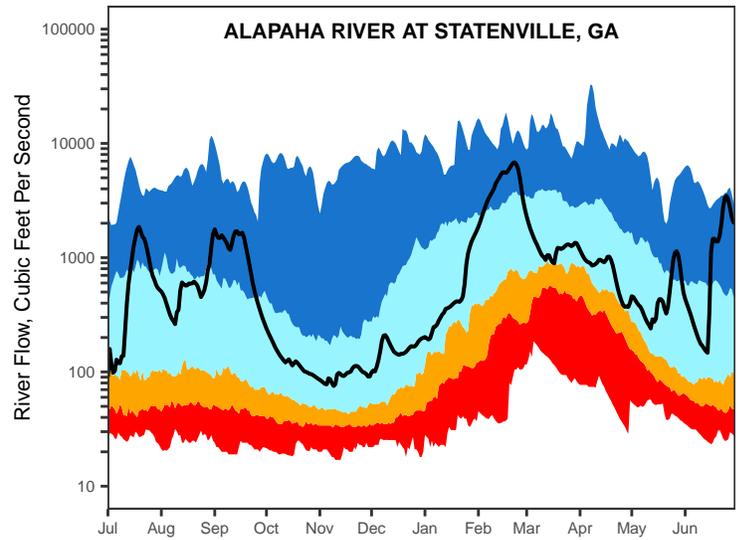
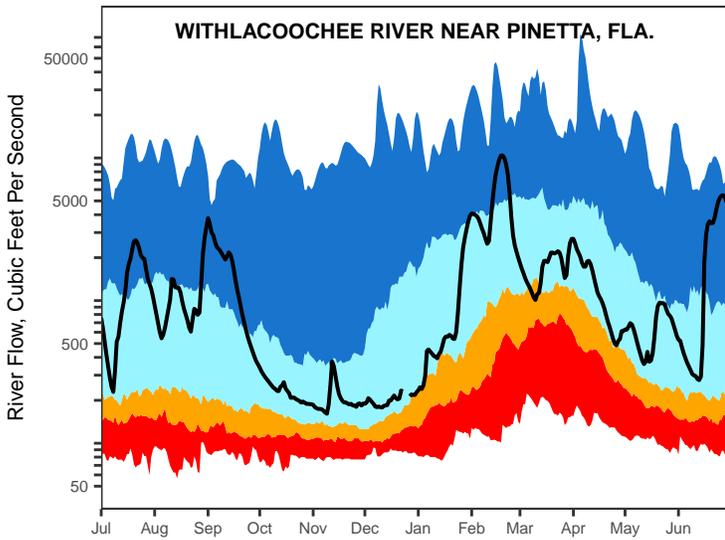
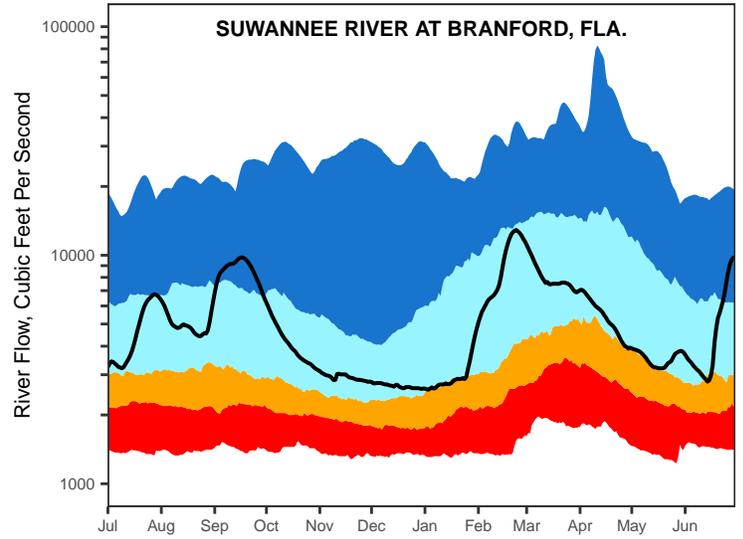
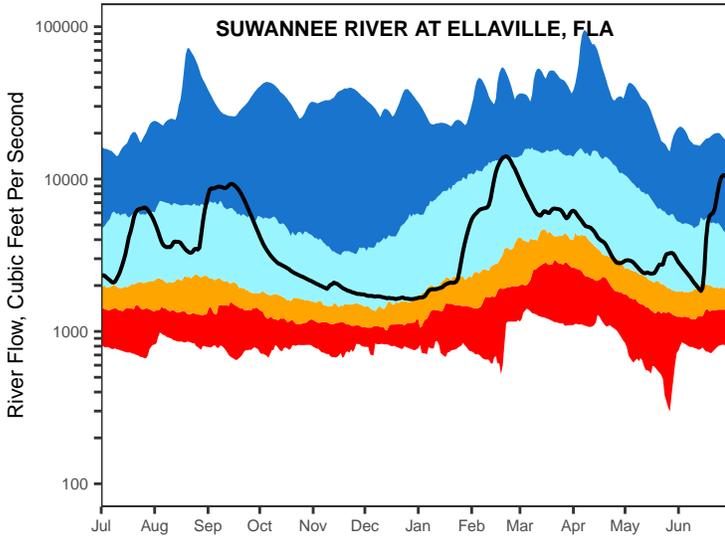
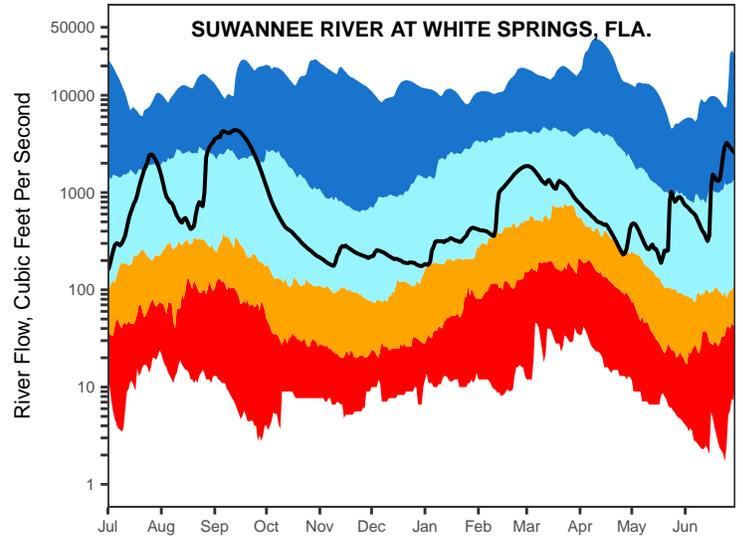
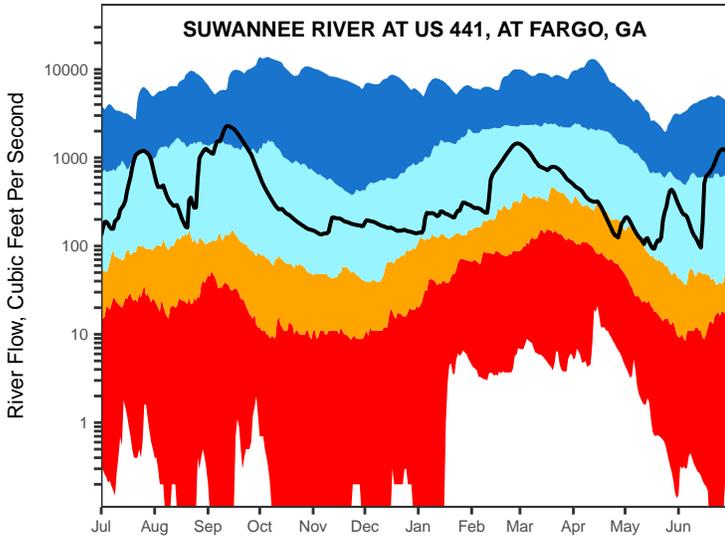
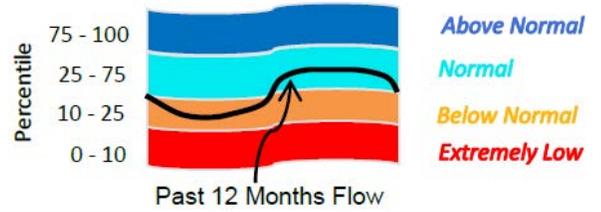
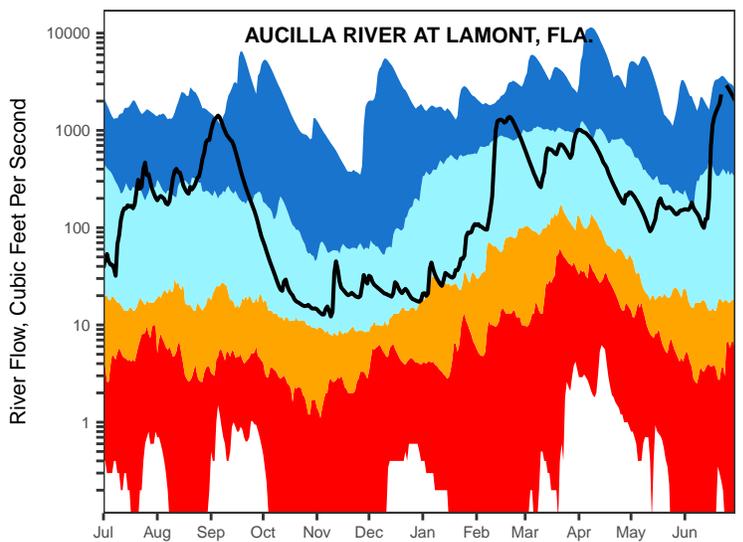
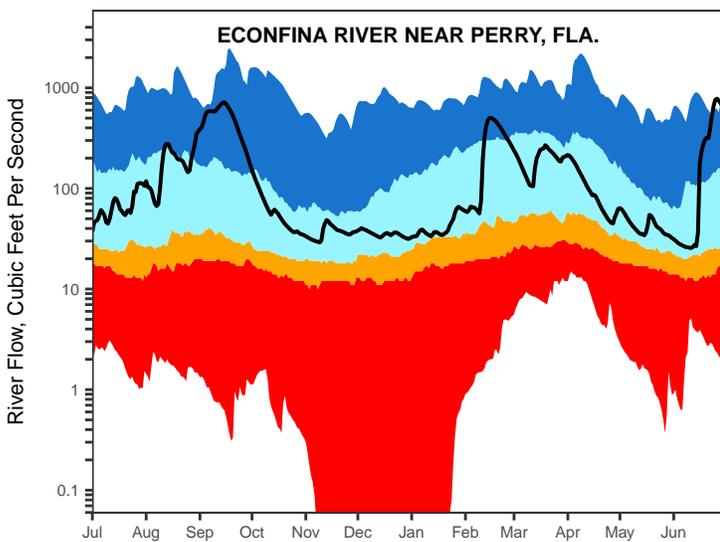
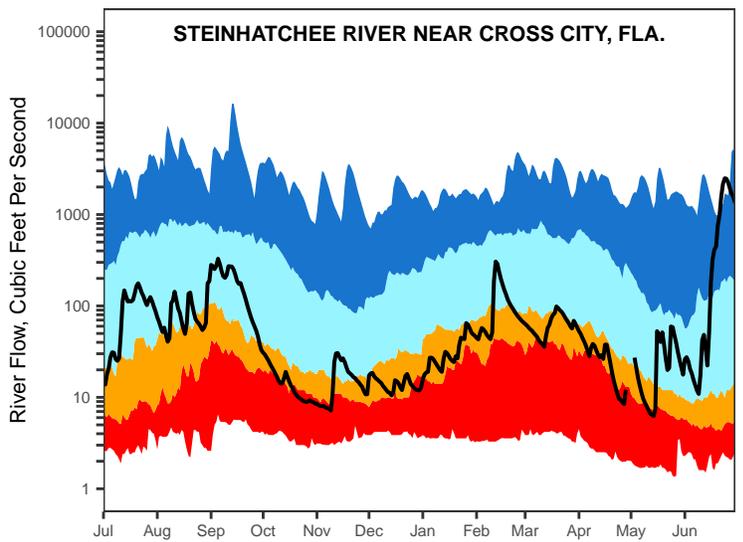
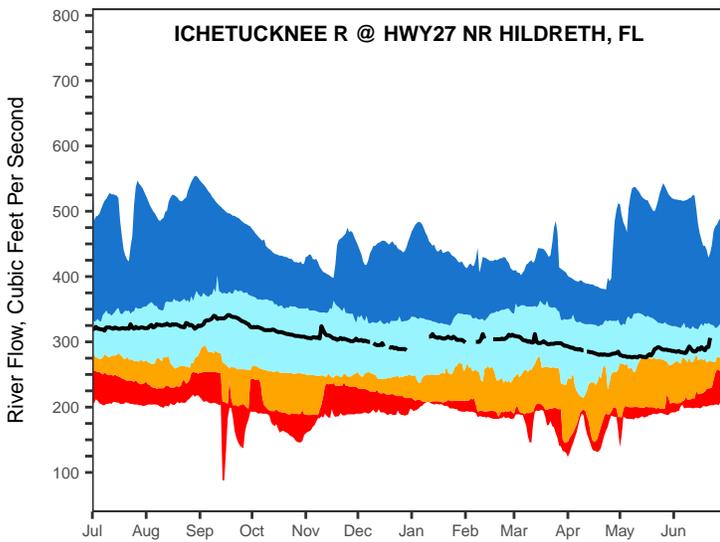
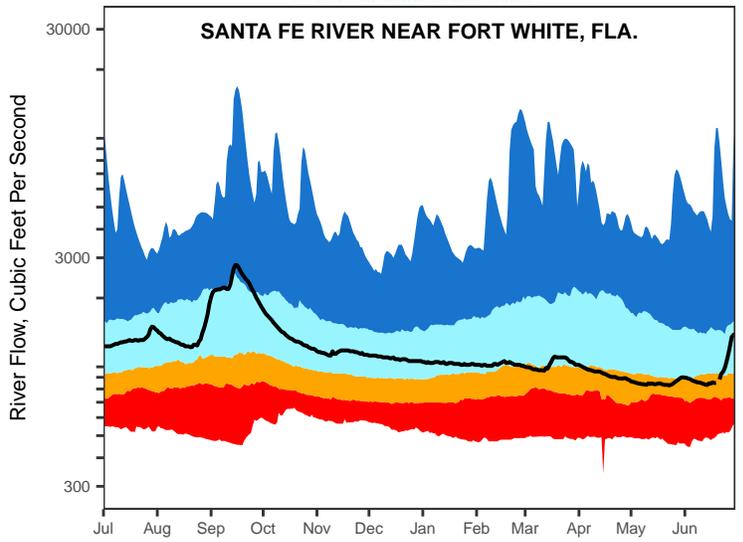
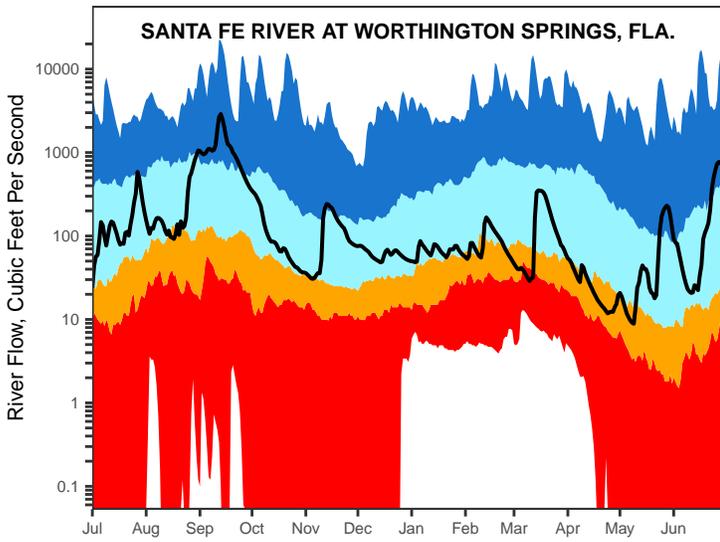
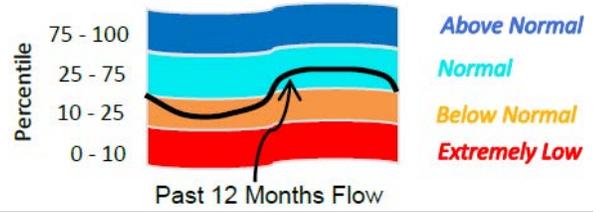


Figure 5, cont.: Daily River Flow Statistics

July 1, 2022 through June 30, 2023



**Figure 6:
Streamflow Conditions
June 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.

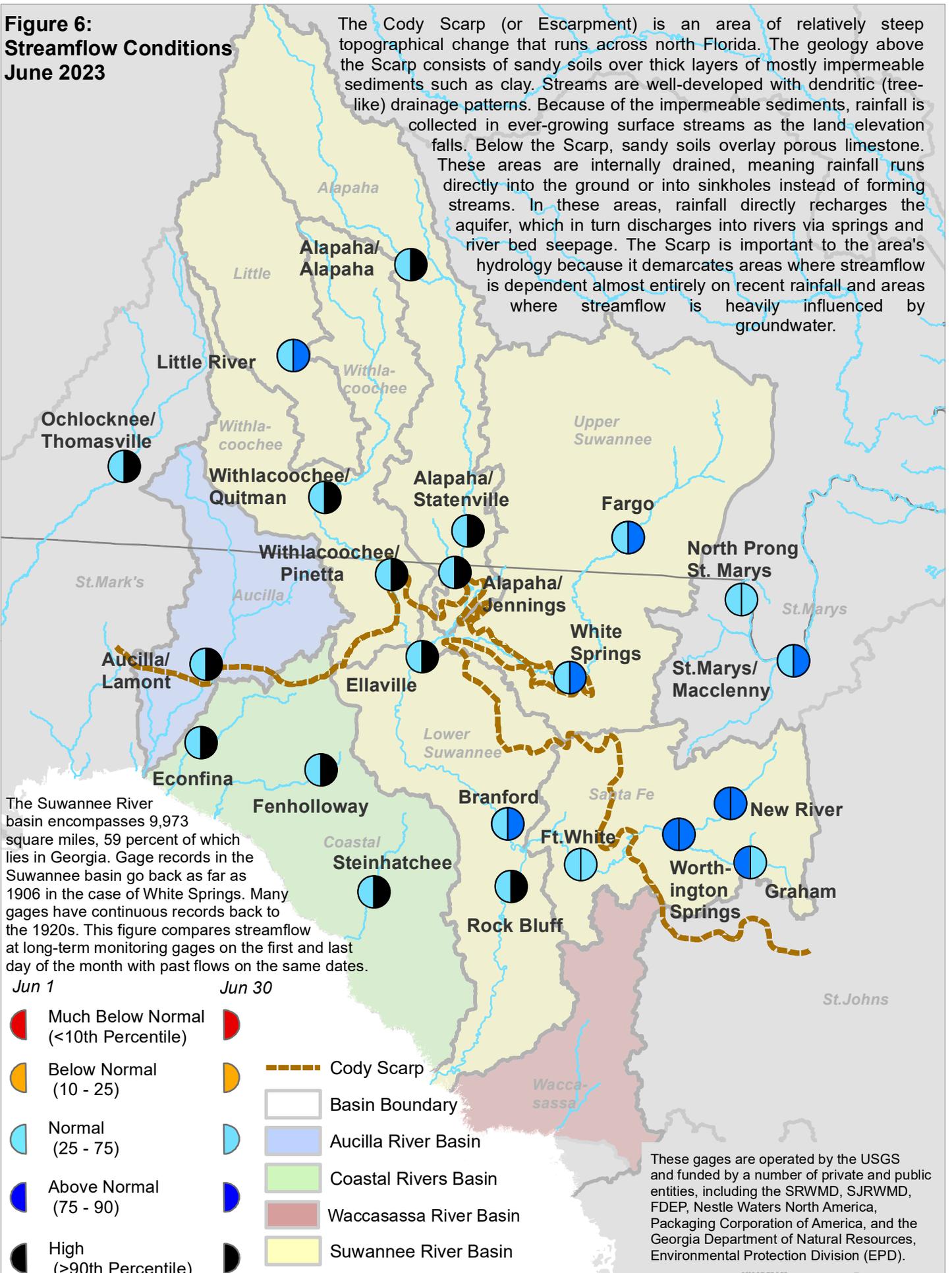
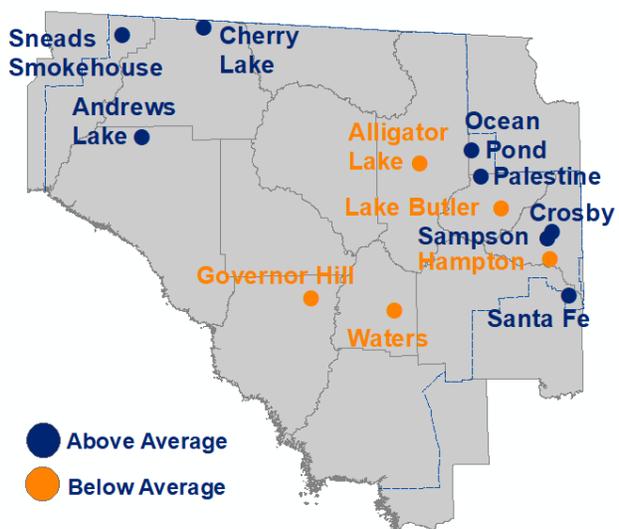


Figure 7: June 2023 Lake Levels



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

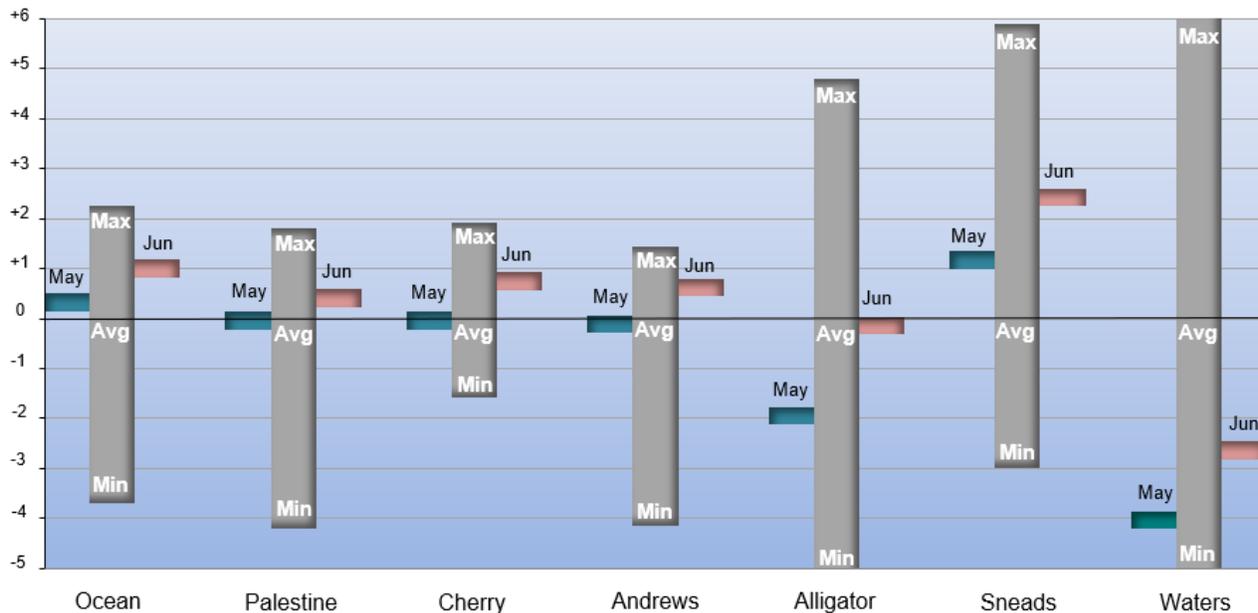
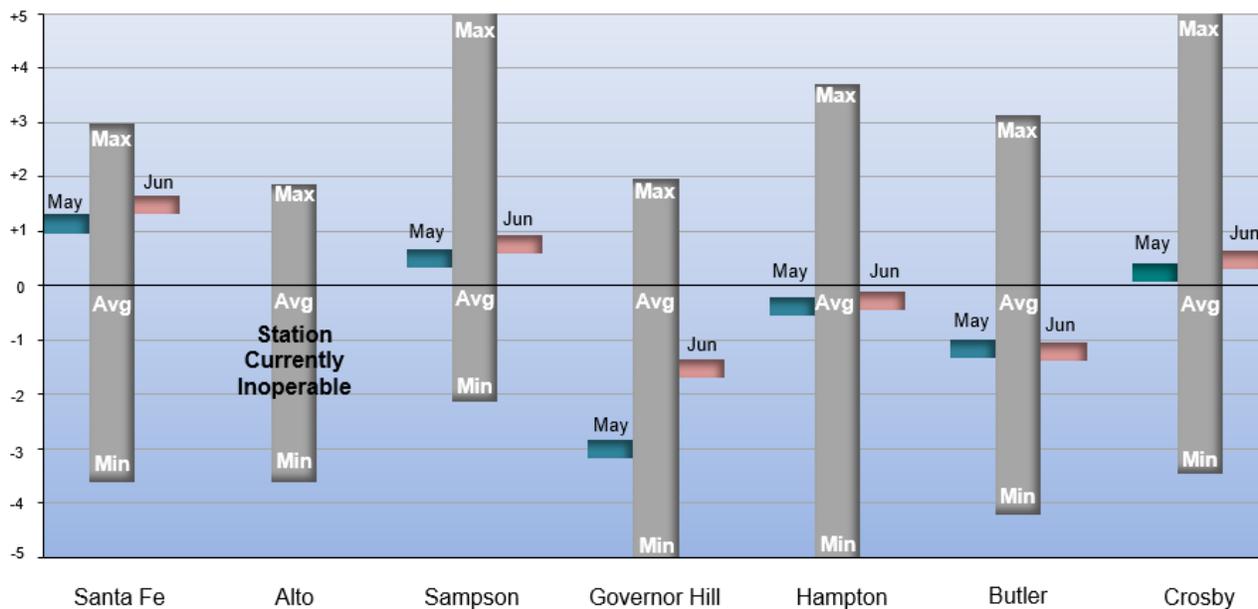


Figure 8: Flow Over the Past 12 Months, Wacissa River (cubic feet per second)

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

Period 12 Month 07/01/2022 to 07/01/2023

2022-23

Percentile statistics are calculated using data from 06/04/1971 to 09/30/2022

Wacissa

- Max-Q75
- Q75-Q25
- Q25-Q10
- Q10-Min
- Archived Data
- Provisional Data

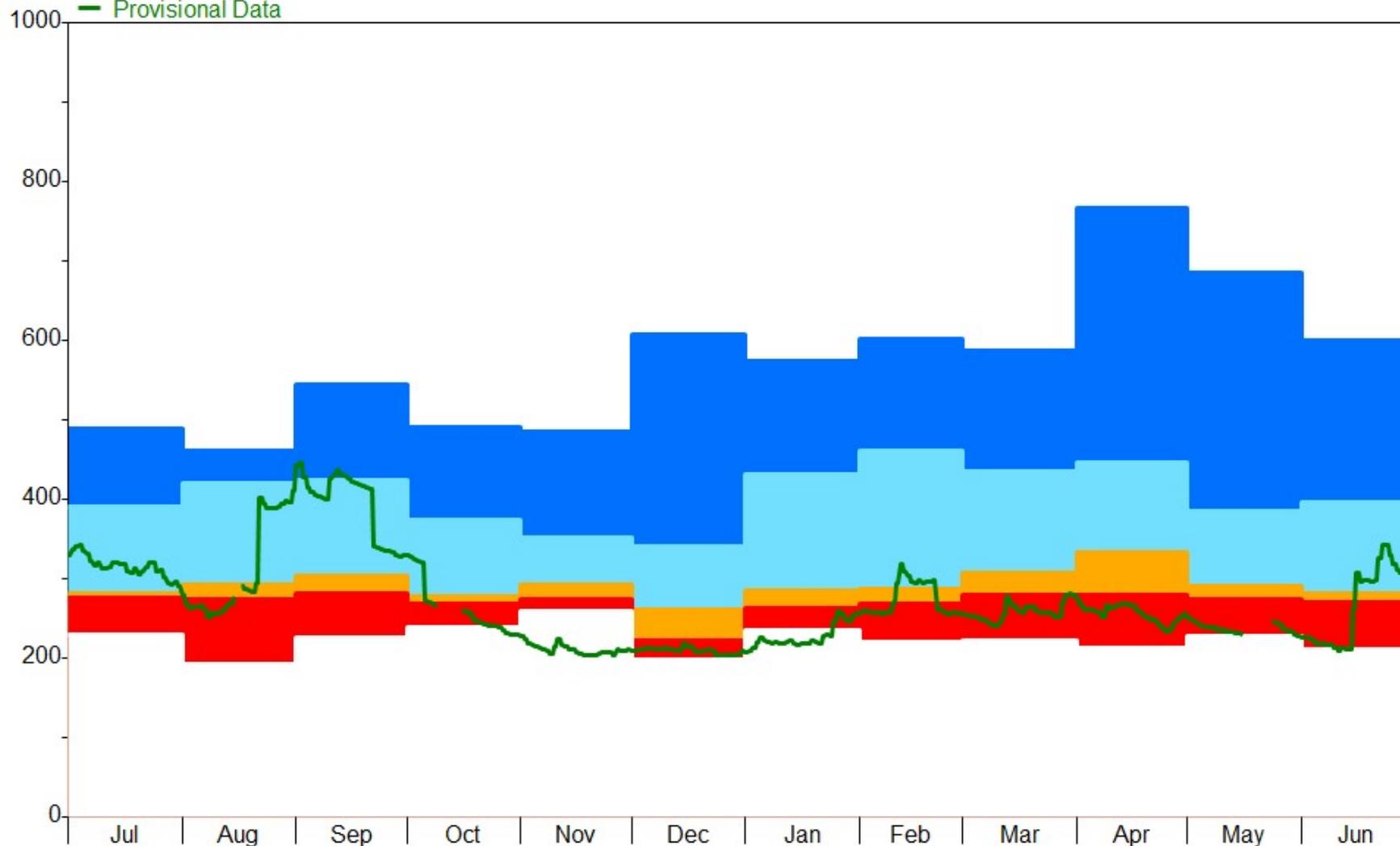


Figure 9: Flow Over the Past 12 Months, Lafayette Blue Springs (cubic feet per second)

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

Period 12 Month 07/01/2022 to 07/01/2023

2022-23

Percentile statistics are calculated using data from 04/23/1985 to 09/30/2022

Lafayette_Blue

■ Max-Q75

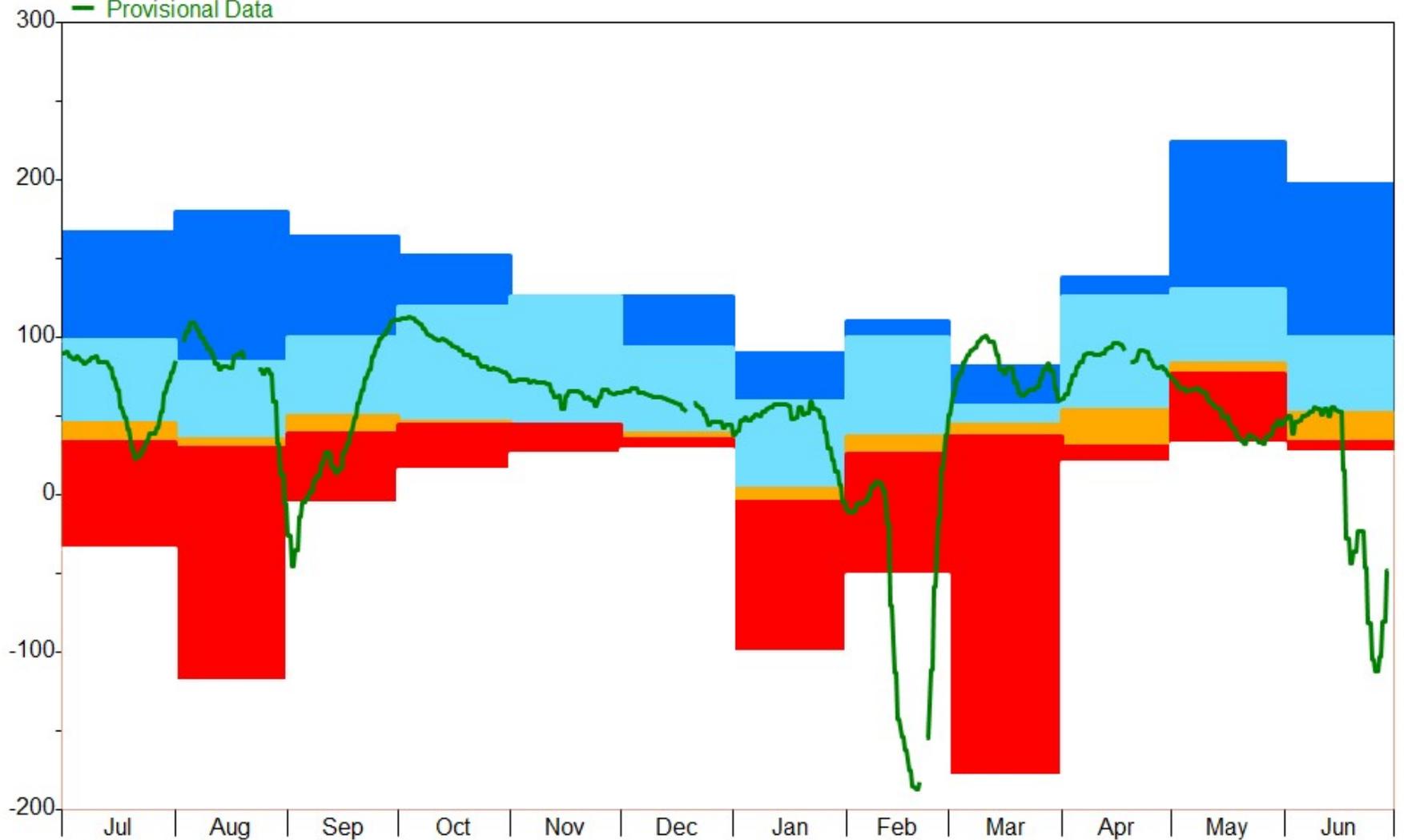
■ Q75-Q25

■ Q25-Q10

■ Q10-Min

— Archived Data

— Provisional Data



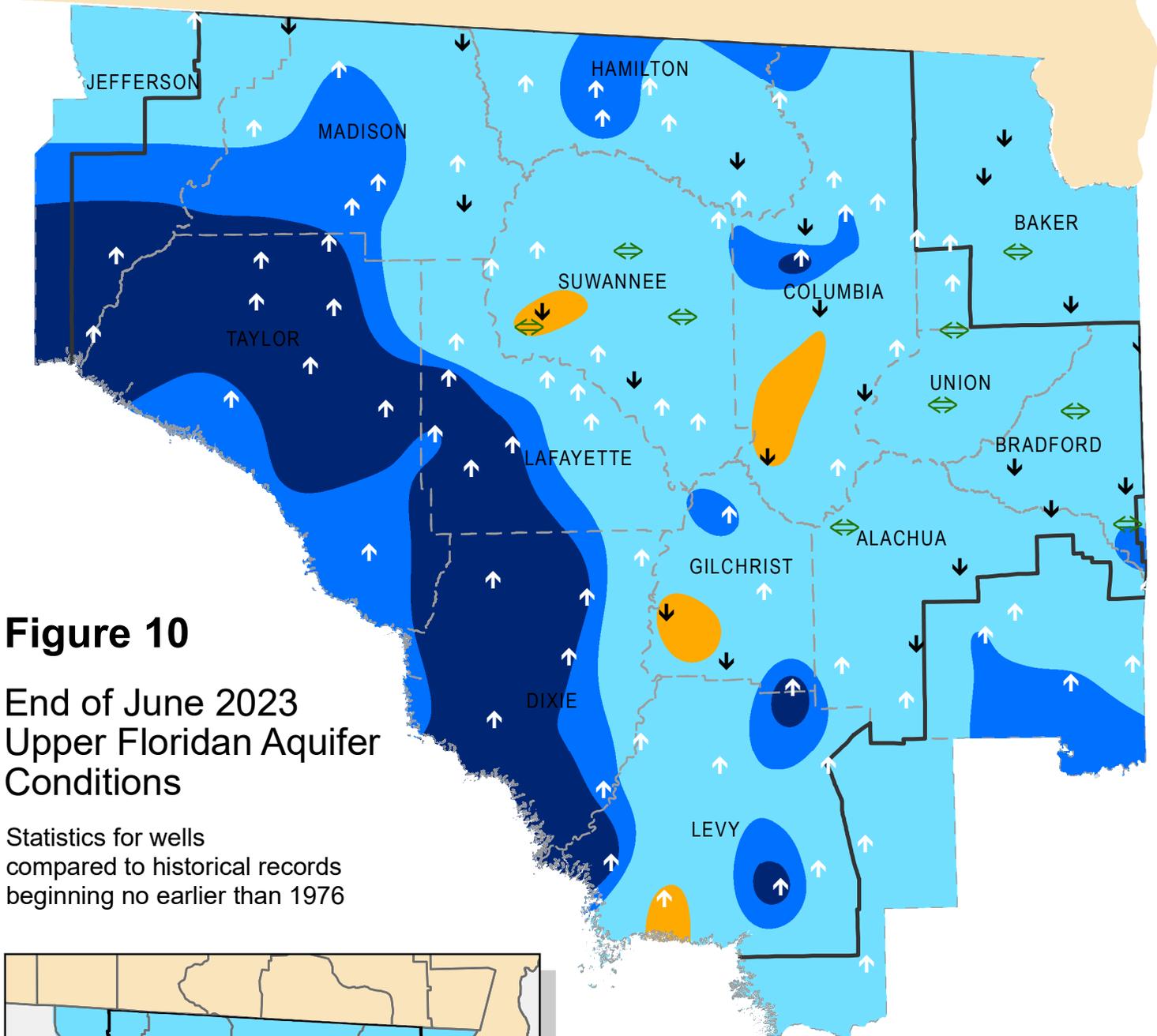
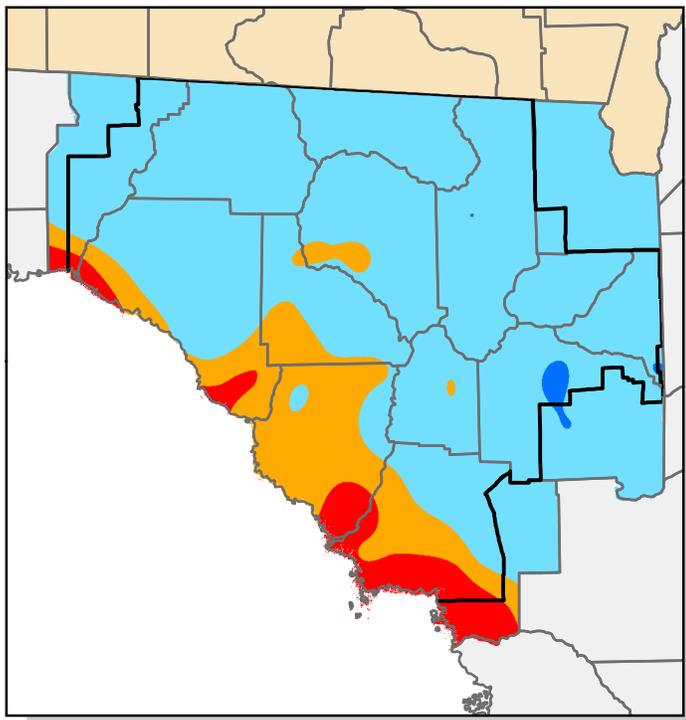


Figure 10

**End of June 2023
Upper Floridan Aquifer
Conditions**

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



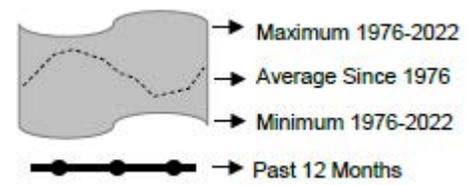
Inset: May Groundwater Percentiles

Additional wells courtesy of SJRWMD, SWFWMD and USGS

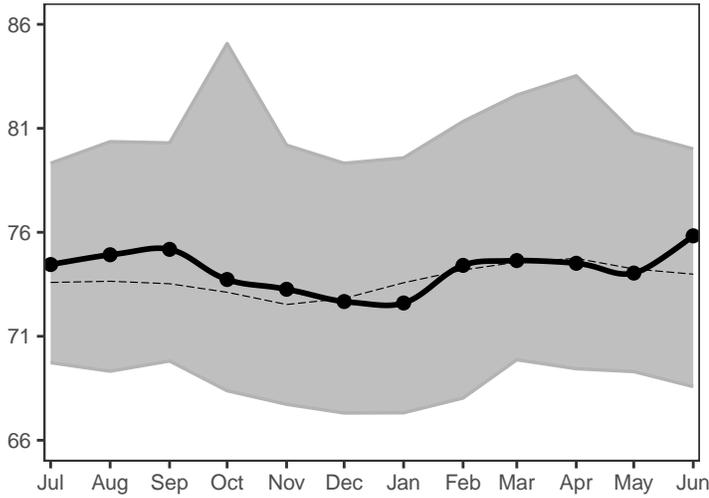
- Extremely High
(Greater than 90th Percentile)
- High
(75th to 90th Percentile)
- Normal
(25th to 75th Percentile)
- Low
(10th to 25th Percentile)
- Extremely Low
(Less than 10th Percentile)
- Increase/decrease in level since last month
- Increase/decrease since last month less than one percent of historic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

Figure 11: Monthly Groundwater Statistics

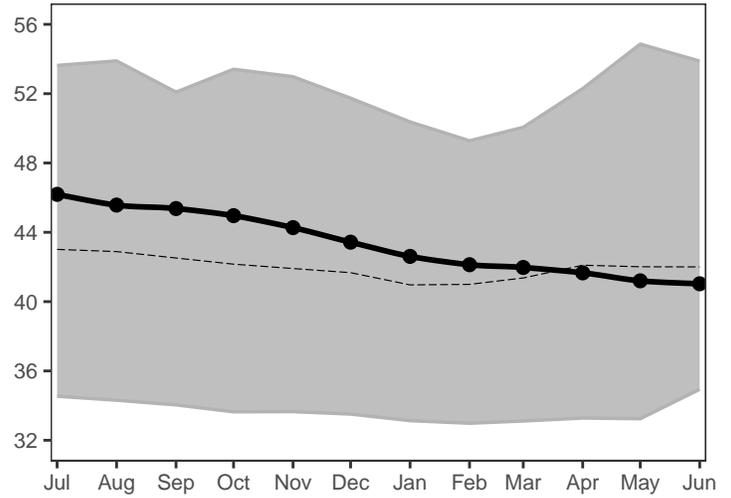
Levels July 2022 through June 2023
 Period of Record Beginning 1976



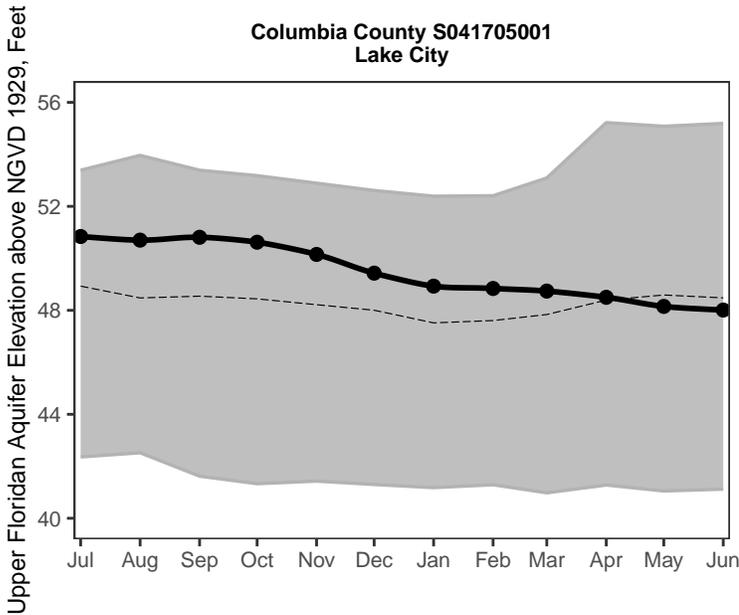
Madison County N010719001
near Greenville



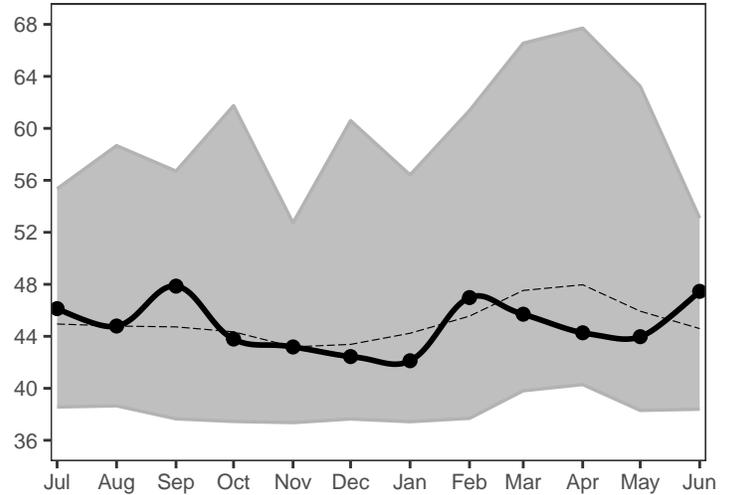
Suwannee County S021335001
near Live Oak



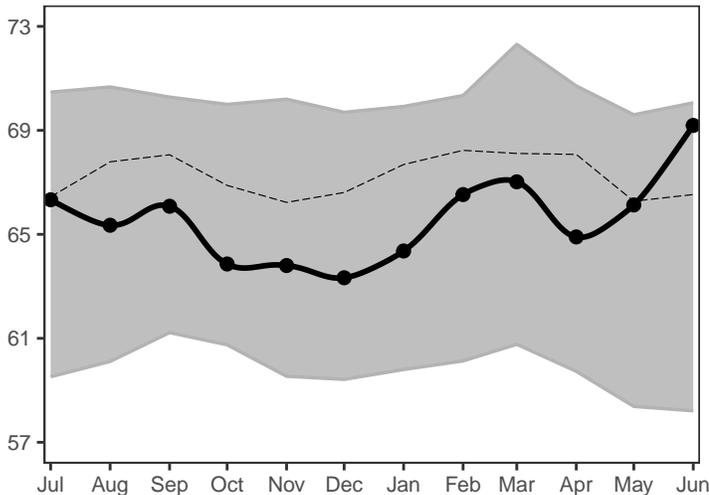
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S040736005
Perry

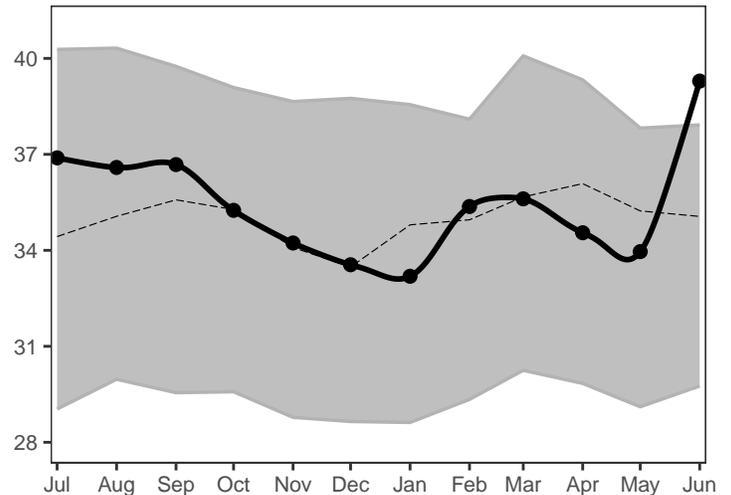
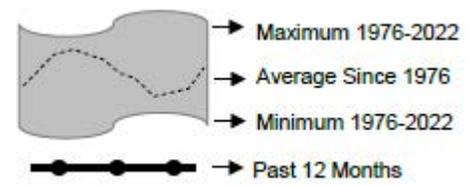
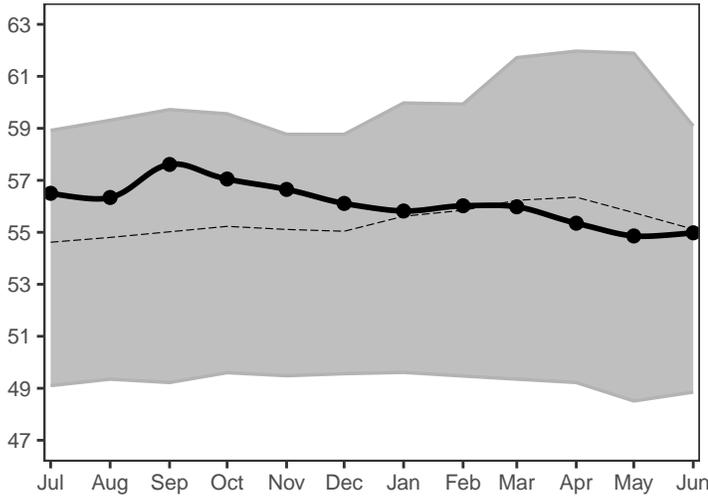


Figure 11, cont.: Monthly Groundwater Statistics

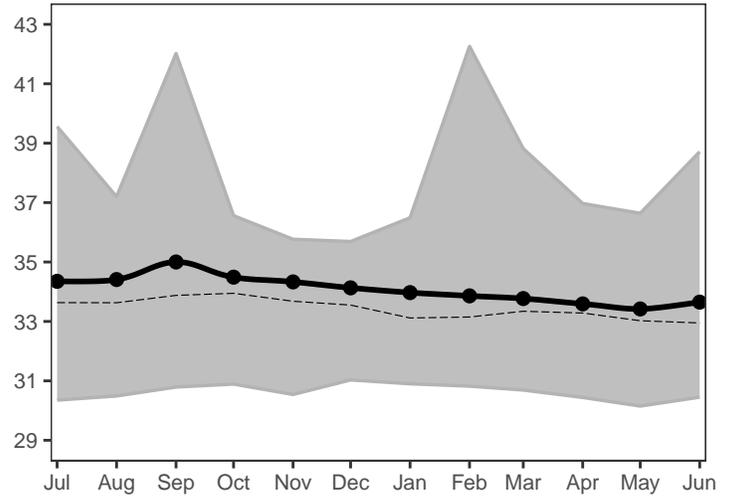
Levels July 2022 through June 2023
 Period of Record Beginning 1976



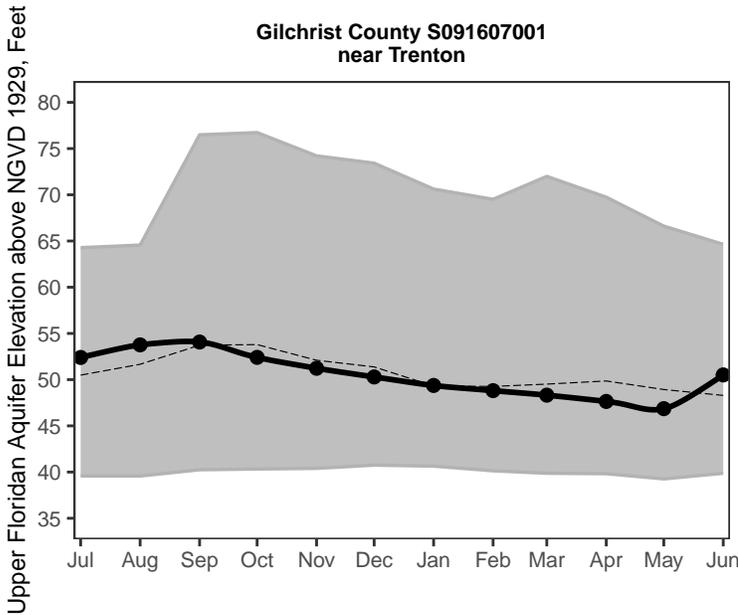
**Union County S051933001
 near Lake Butler**



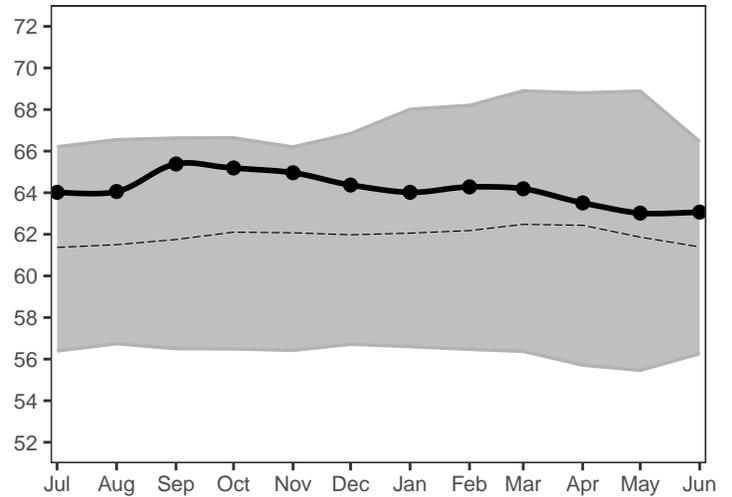
**Alachua County S081703001
 at High Springs**



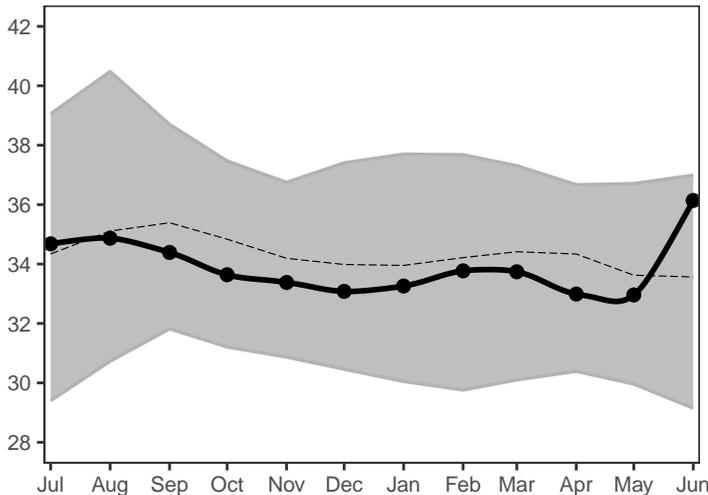
**Gilchrist County S091607001
 near Trenton**



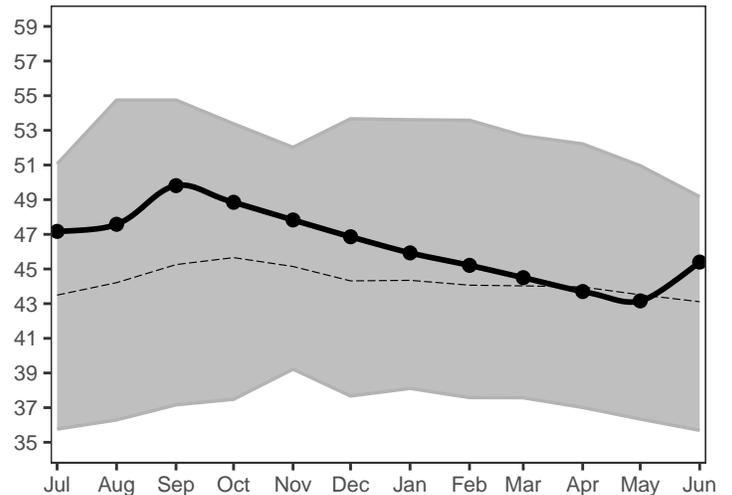
**Bradford County S072132001
 near Graham**

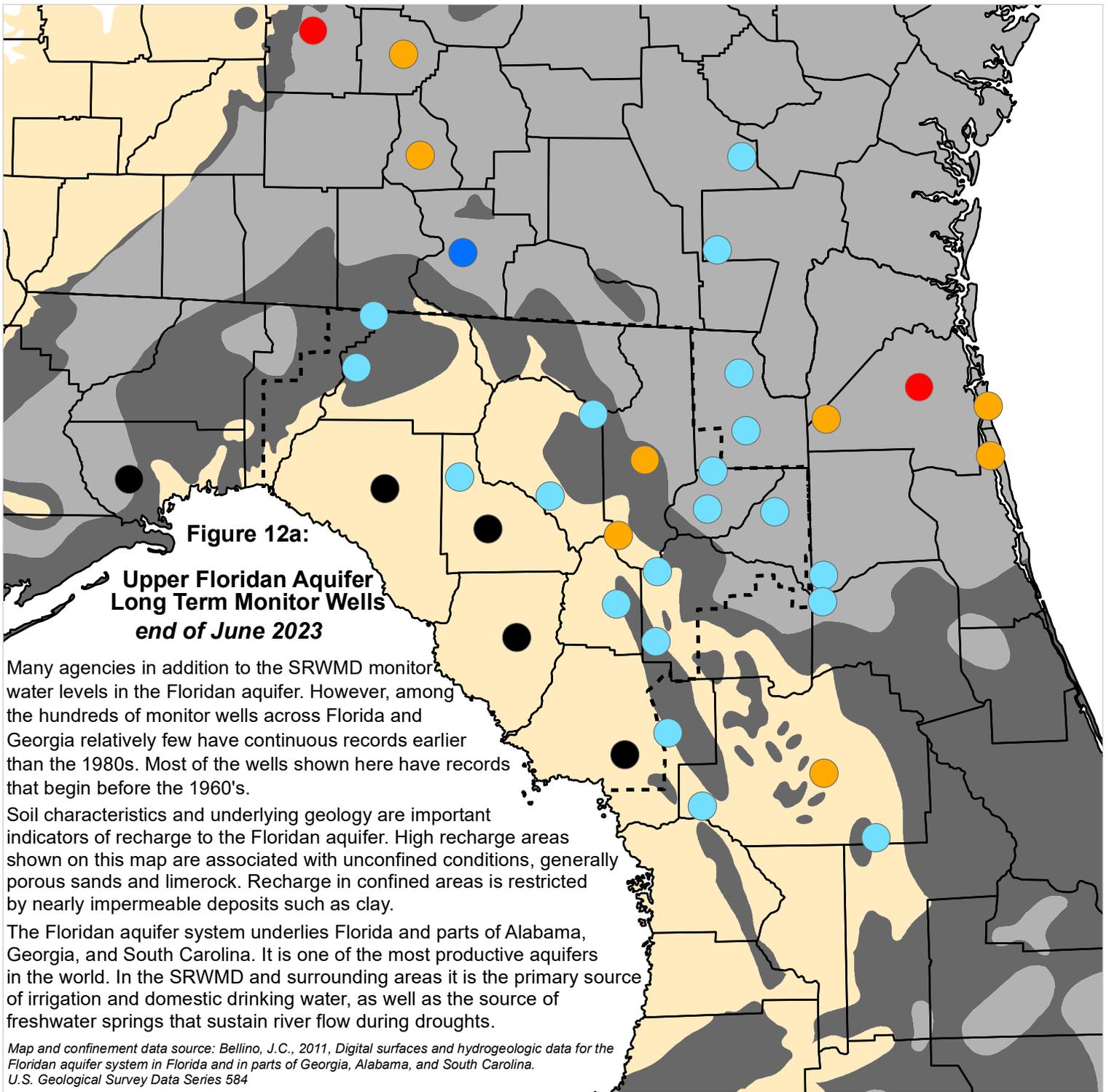


**Dixie County S101210001
 at Cross City**



**Levy County S131736001
 near Bronson**





Occurrence of Confined and Unconfined Conditions in the Upper Floridan Aquifer

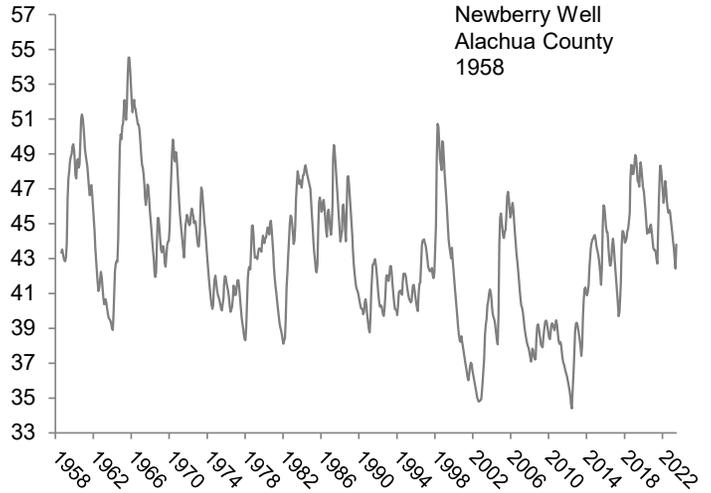
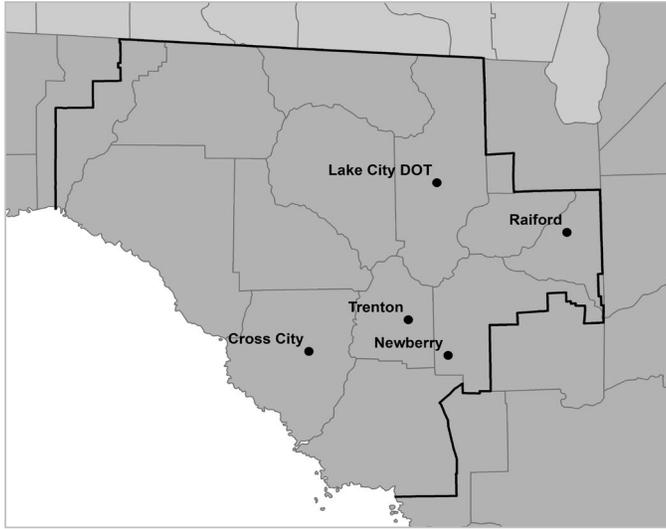
-  Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
-  Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
-  Unconfined: Upper confining unit is absent or very thin. Recharge is high.
-  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 June 2023



Upper Floridan Aquifer Elevation above NGVD 1929, Feet

