

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: April 30, 2023

RE: April 2023 Hydrologic Conditions Report

RAINFALL

- Districtwide average rainfall for the month was 2.96, which was about 13% lower than the 1932-2022 average of 3.39" (Table 1, Figure 1). The 12-month period ending April 30 reflected a Districtwide rainfall deficit of 8.98", which was a slight decrease in the 10.11" deficit seen at the end of March. Most District counties received between 2" and 4" of rainfall on average with areas of Hamilton, Suwannee, and Alachua counties receiving more than 5" of rainfall (Figure 2).
- A 12-month rainfall deficit was still present for all river basins, with most showing small decreases in deficit by the end of April. (Figure 3). Only the Waccasassa Basin had a slight increase in deficit over the past 12 months. Areas within each of the river basins still showed rainfall deficits of greater than 14" at the end of the month. Portions of the Suwannee Basin, however, had surpluses greater than 6" by month's end. Four of the river basins also exhibited 3-month rainfall deficits, with each decreasing from March to April (Figure 4). The Aucilla Basin still retained a 2.8" rainfall surplus at the end of April due to increased rainfall in that area over the past 3 months.

SURFACE WATER

- **Rivers:** Many of the river stations shown in Figure 5 finished the month in the normal (25th – 75th percentile) flow range. Despite trending in or near the below normal (10th – 25th percentile) flow range at the end of April, most of the monitored river gages in Figure 5 saw a rise in flow due to an increase in rainfall on the last few days of the month. Both the Steinhatchee near Cross City and the Santa Fe River near Ft. White gages ended April with below normal flows (Figure 6) while other rivers around the District concluded the month in the normal flow category.
- **Lakes:** Water decreased at most monitored lakes in the District this month (Figure 7). The median decrease in stage across all measured lakes was around 0.4'. Alligator Lake had the highest stage decrease of around 2.5' this month and is close to its long-term minimum. Eight lakes 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 April at 25 springs by the U.S. Geological Survey (USGS), District staff, and contractors. Lafayette Blue Springs (Figure 8) had flows mainly in the normal range throughout April. Fanning Springs saw flows in both the normal and above normal (75th – 100th percentile) flow categories during the month (Figure 9).

GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District reflected mainly normal levels in April (Figure 10). However, areas of Jefferson, Lafayette, Taylor, Dixie, Levy, and Gilchrist counties saw levels in either the low (10th – 25th percentile) or extremely low (<10th percentile) ranges at the end of the month. Overall, groundwater levels decreased by a median of about 0.8' since the end of March and ended April with a Districtwide average around the 45th percentile.

Many of the county index wells were lower than the historical monthly average levels at the end of April except for wells in Columbia, Alachua, and Bradford counties (Figure 11). Most of the long-term District UFA well levels ended the month in either the normal, low, or very low categories (Figure 12a). Overall, water levels at long-term wells with records that extend back to at least 1964 mostly decreased this month (Figure 12b).

CLIMATE AND DROUGHT OUTLOOK

The Climate Prediction Center has indicated that El Niño Southern Oscillation (ENSO) neutral conditions are expected to continue through the spring followed by around a 60% chance of El Niño development from May to July 2023.

The NOAA three-month seasonal outlook favors above normal temperatures along with above normal rainfall throughout the District from May through July.

The U.S. Drought Monitor report released on May 4, 2023, shows the southern and eastern parts of the District in either Abnormally Dry (D0) or Moderate Drought (D1), with portions of Levy County also including the Severe Drought (D2) and Extreme Drought (D3) categories.

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	April 2023	April Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal
Alachua	2.71	3.14	86%	42.56	81%
Baker	2.67	3.39	79%	43.37	82%
Bradford	2.35	2.96	79%	42.63	82%
Columbia	3.33	3.47	96%	46.50	88%
Dixie	2.89	3.38	86%	44.67	77%
Gilchrist	2.43	3.30	74%	41.16	75%
Hamilton	3.97	3.69	108%	45.09	87%
Jefferson	3.41	4.05	84%	46.67	83%
Lafayette	3.24	3.54	92%	45.55	82%
Levy	2.10	3.07	68%	43.76	78%
Madison	3.23	3.85	84%	51.23	96%
Suwannee	3.26	3.66	89%	45.04	85%
Taylor	2.92	3.63	80%	47.46	84%
Union	2.56	3.24	79%	44.09	84%

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

April 2022 District Average	2.96
April Long-Term Average (1932-2022)	3.39
Historical 12-month Average (1932-2022)	54.66
Past 12-Month Total	45.68
12-Month Rainfall Surplus/Deficit	-8.98

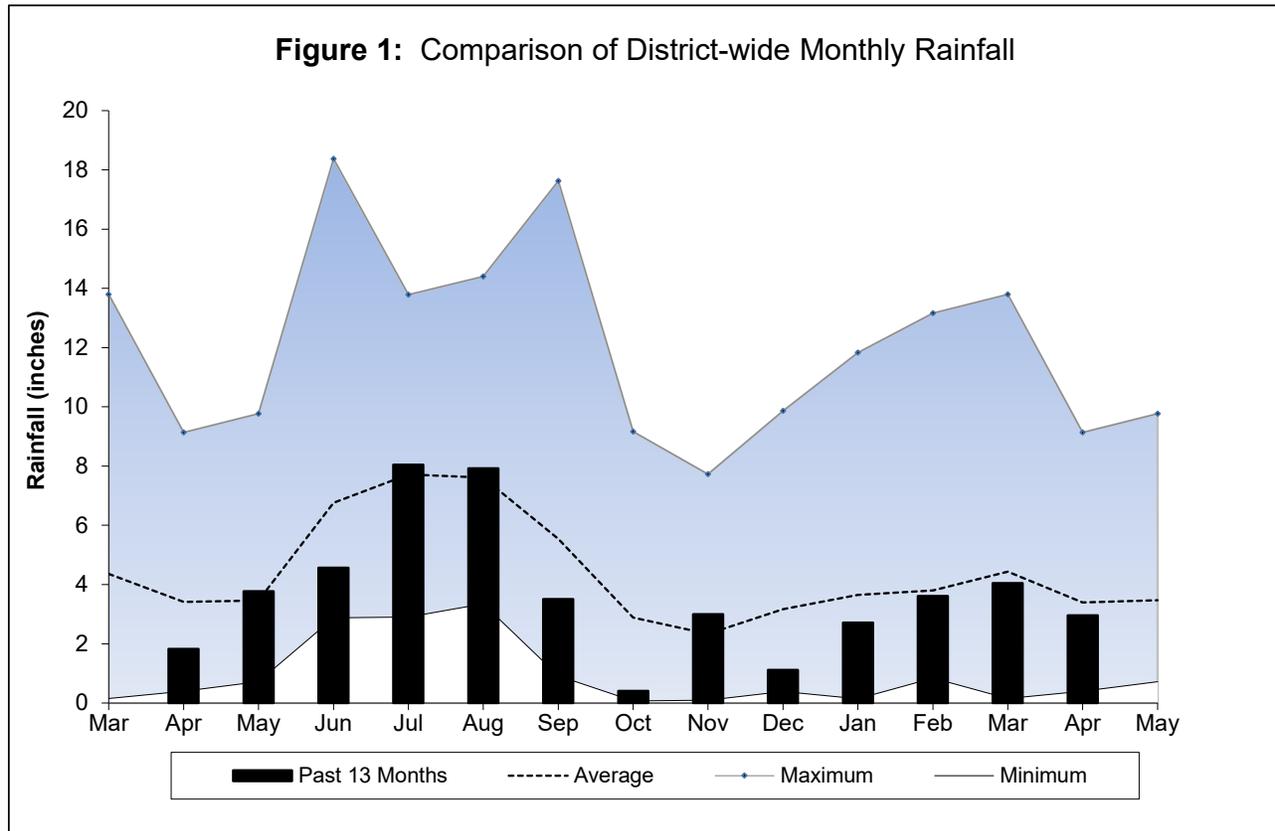


Figure 2: April 2023 SRWMD Gage-adjusted Radar Rainfall

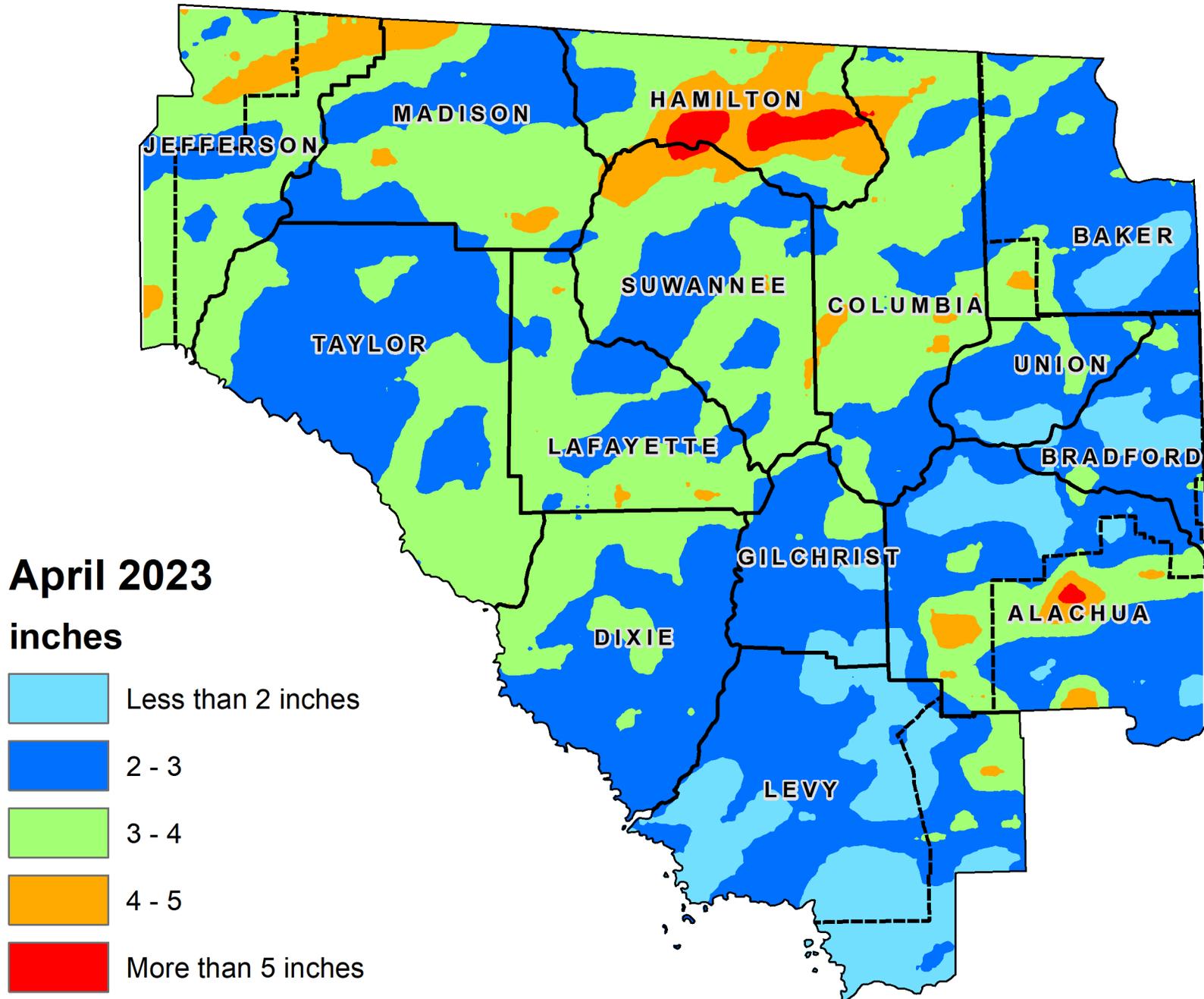


Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through April 30, 2023

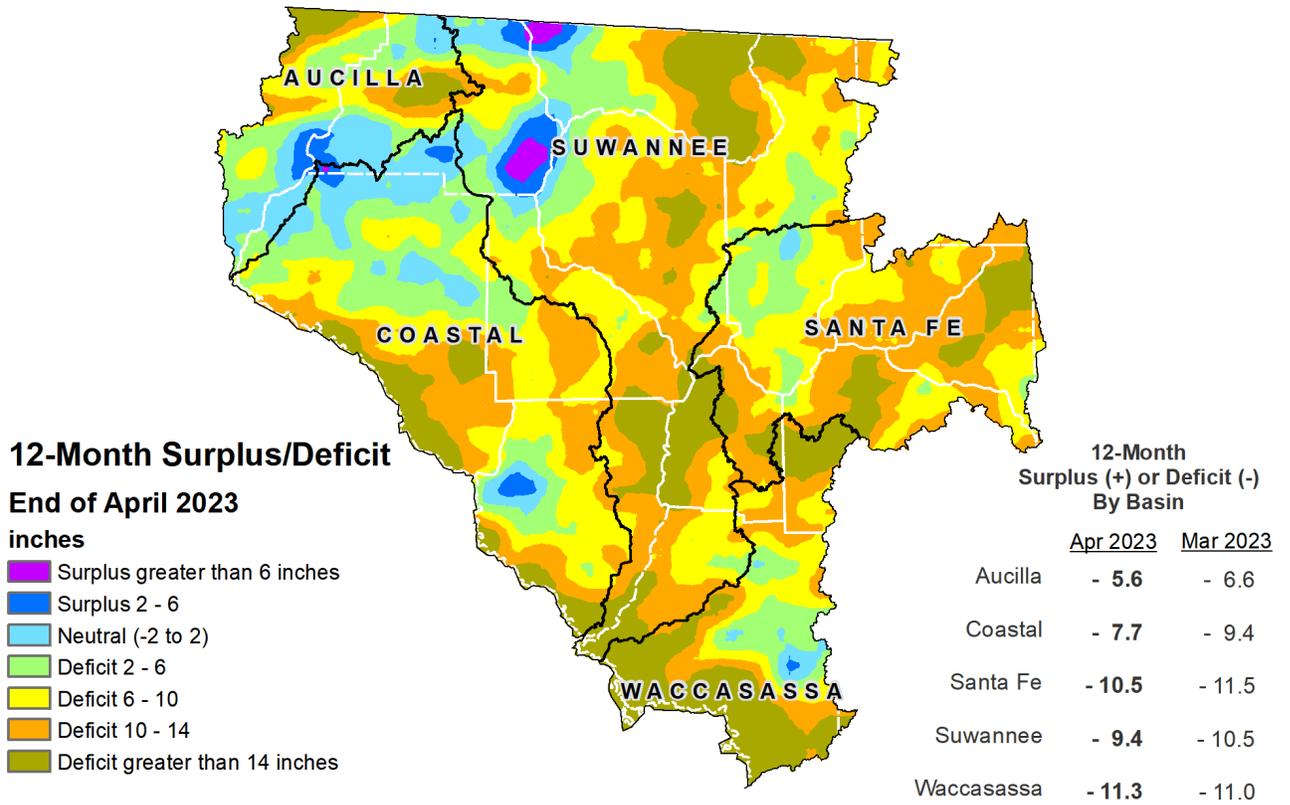


Figure 4: 3 - Month Rainfall Surplus/Deficit by River Basin through April 30, 2023

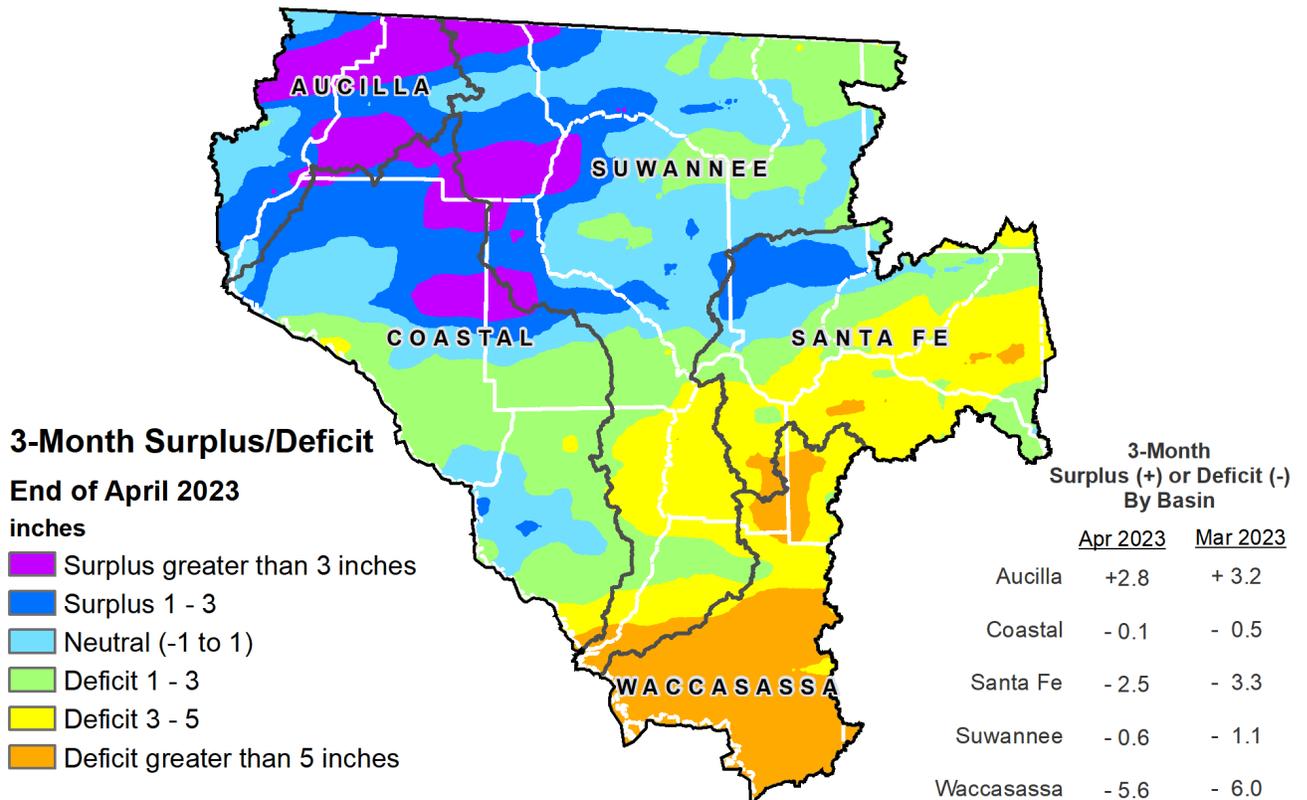


Figure 5: Daily River Flow Statistics

May 1, 2022 through April 30, 2023

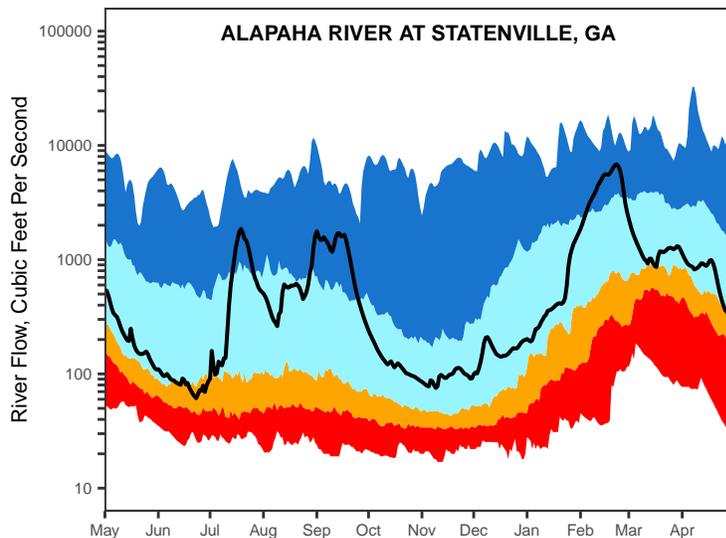
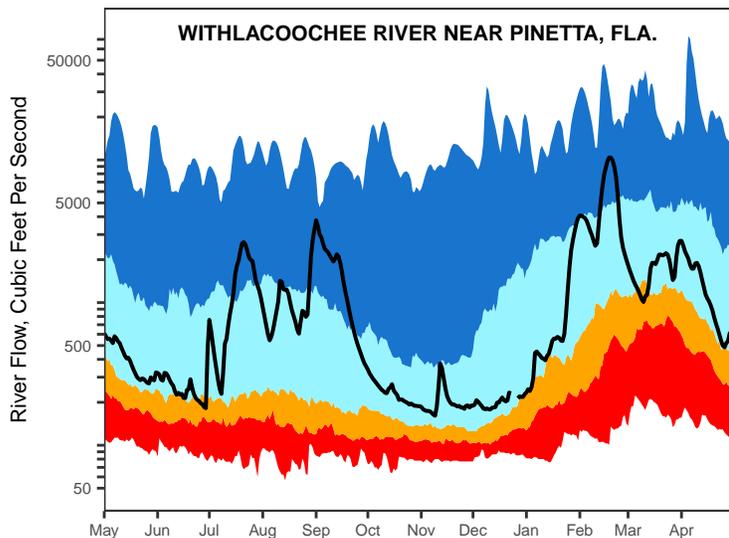
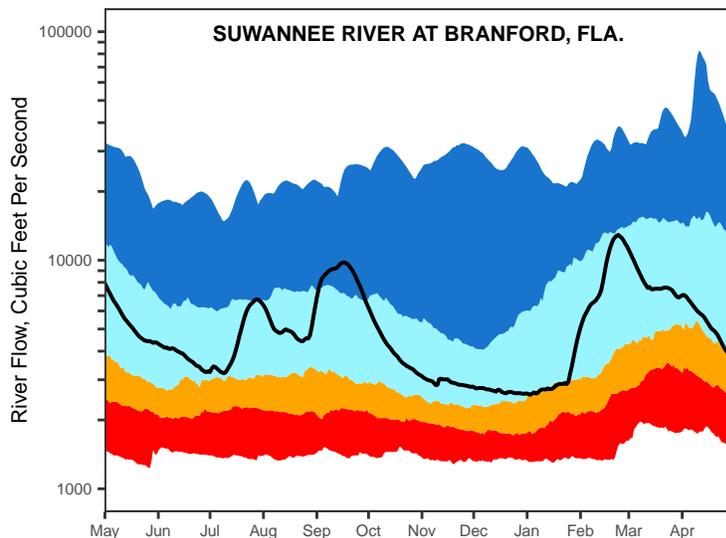
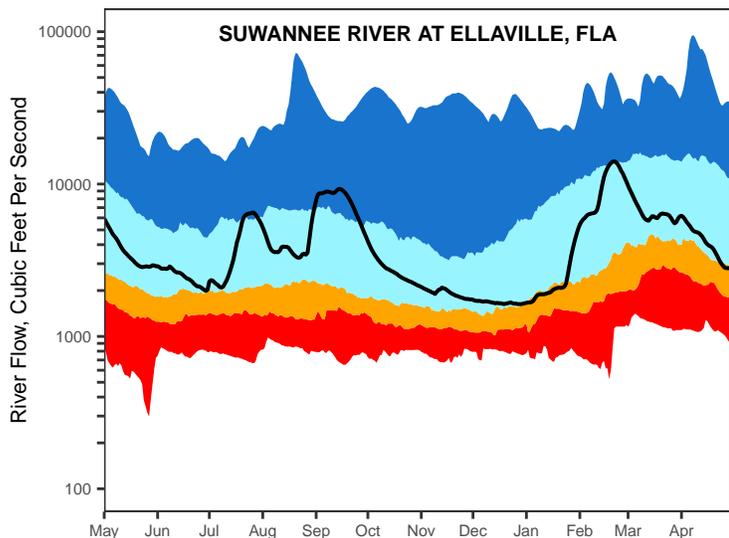
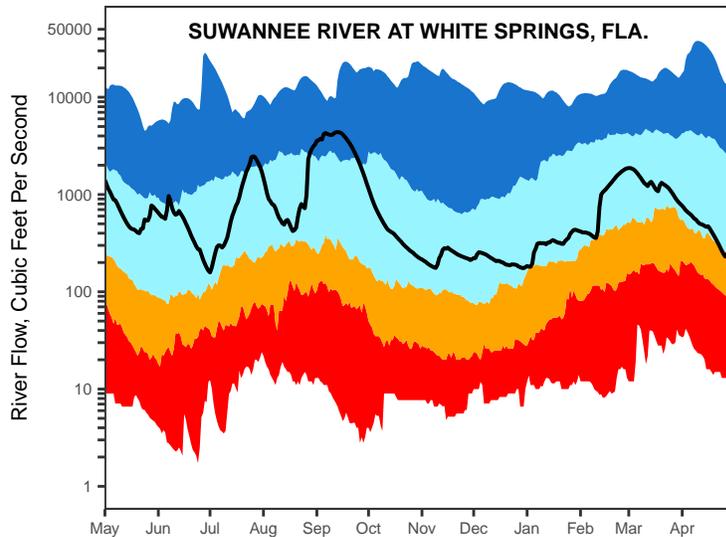
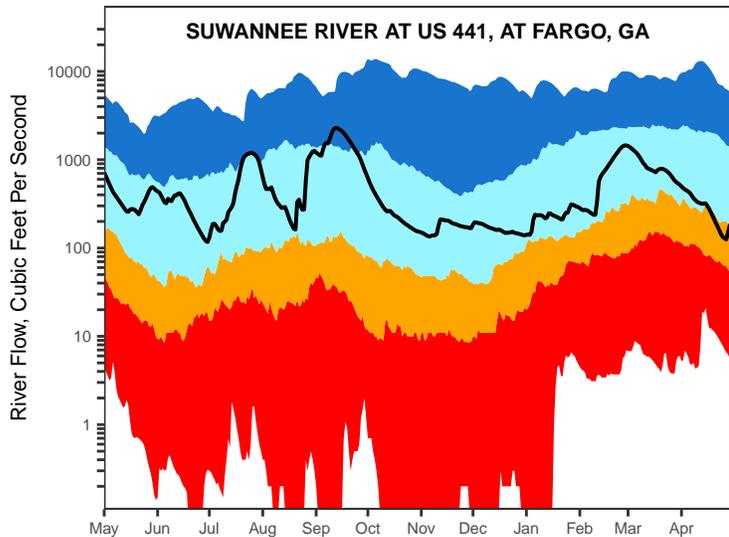
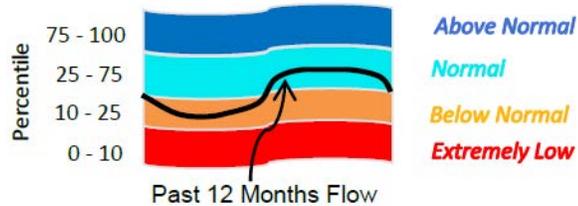
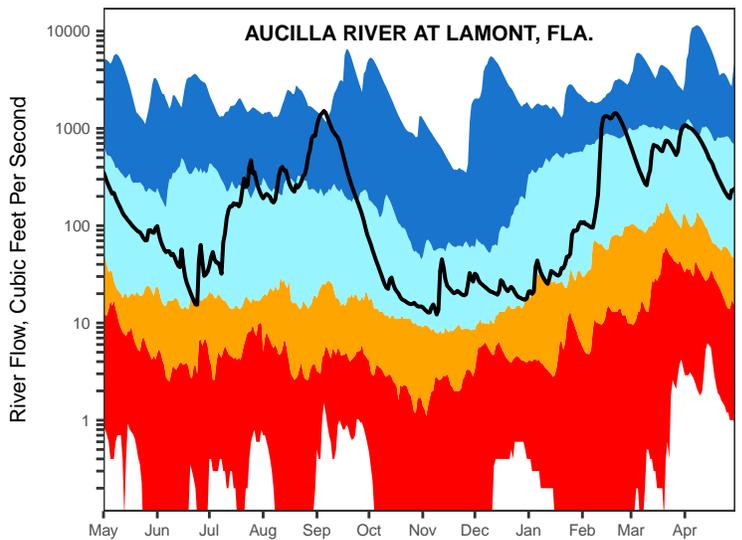
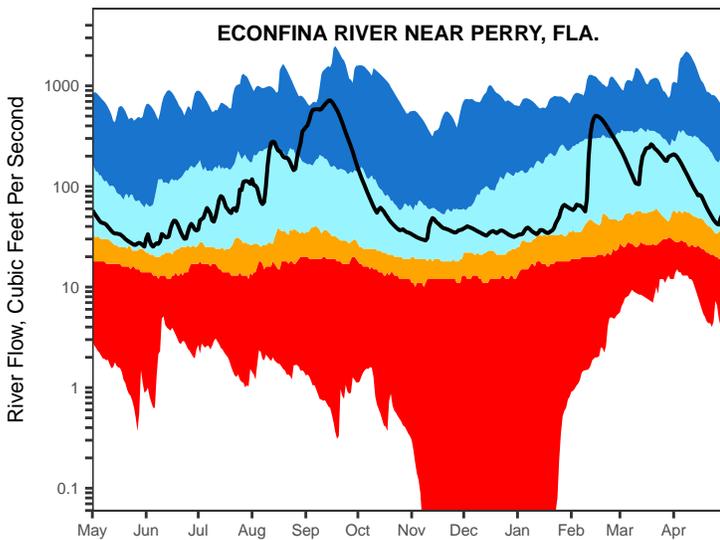
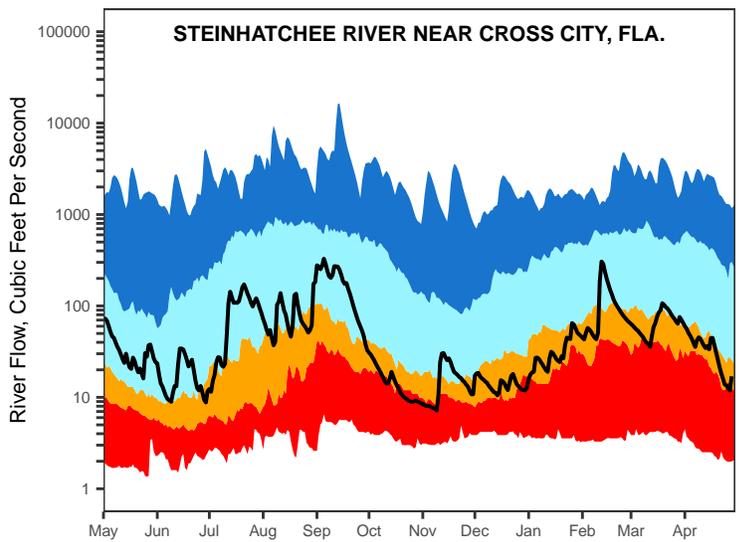
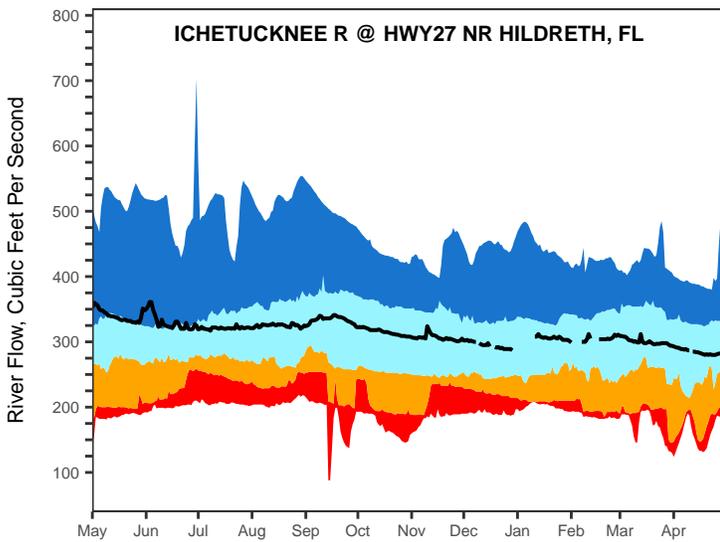
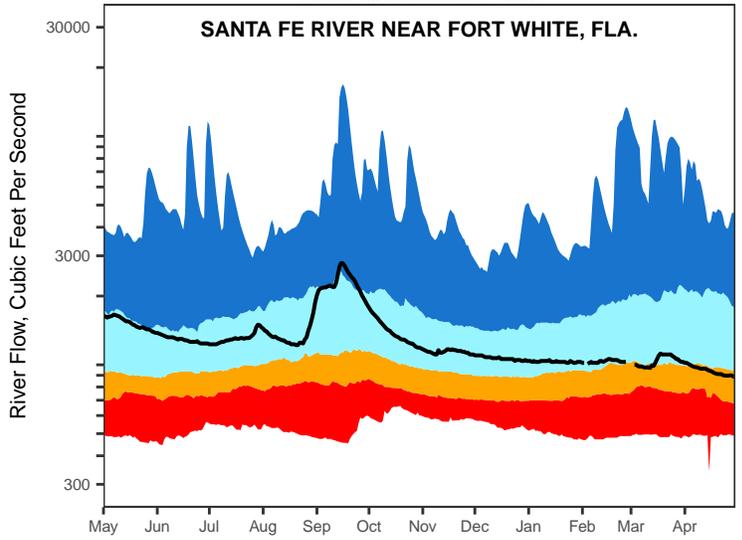
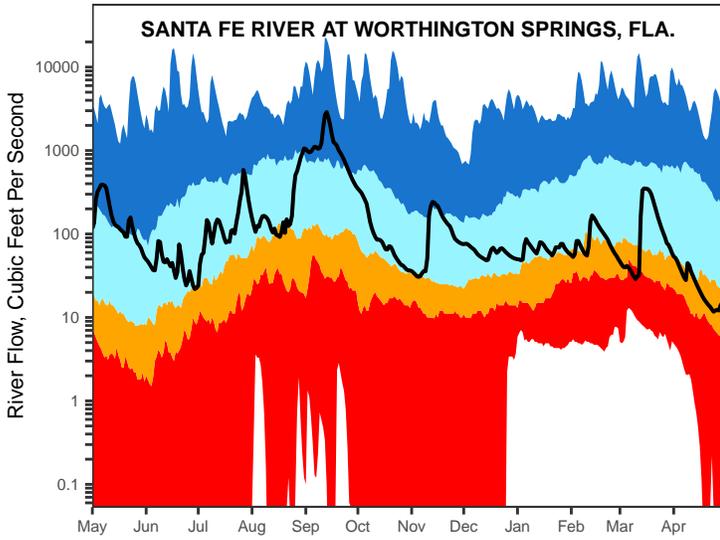
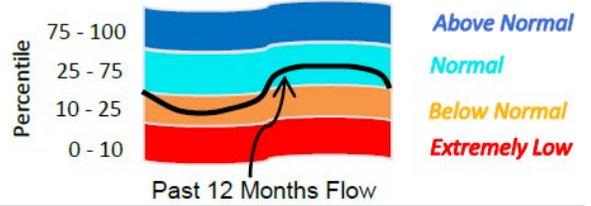


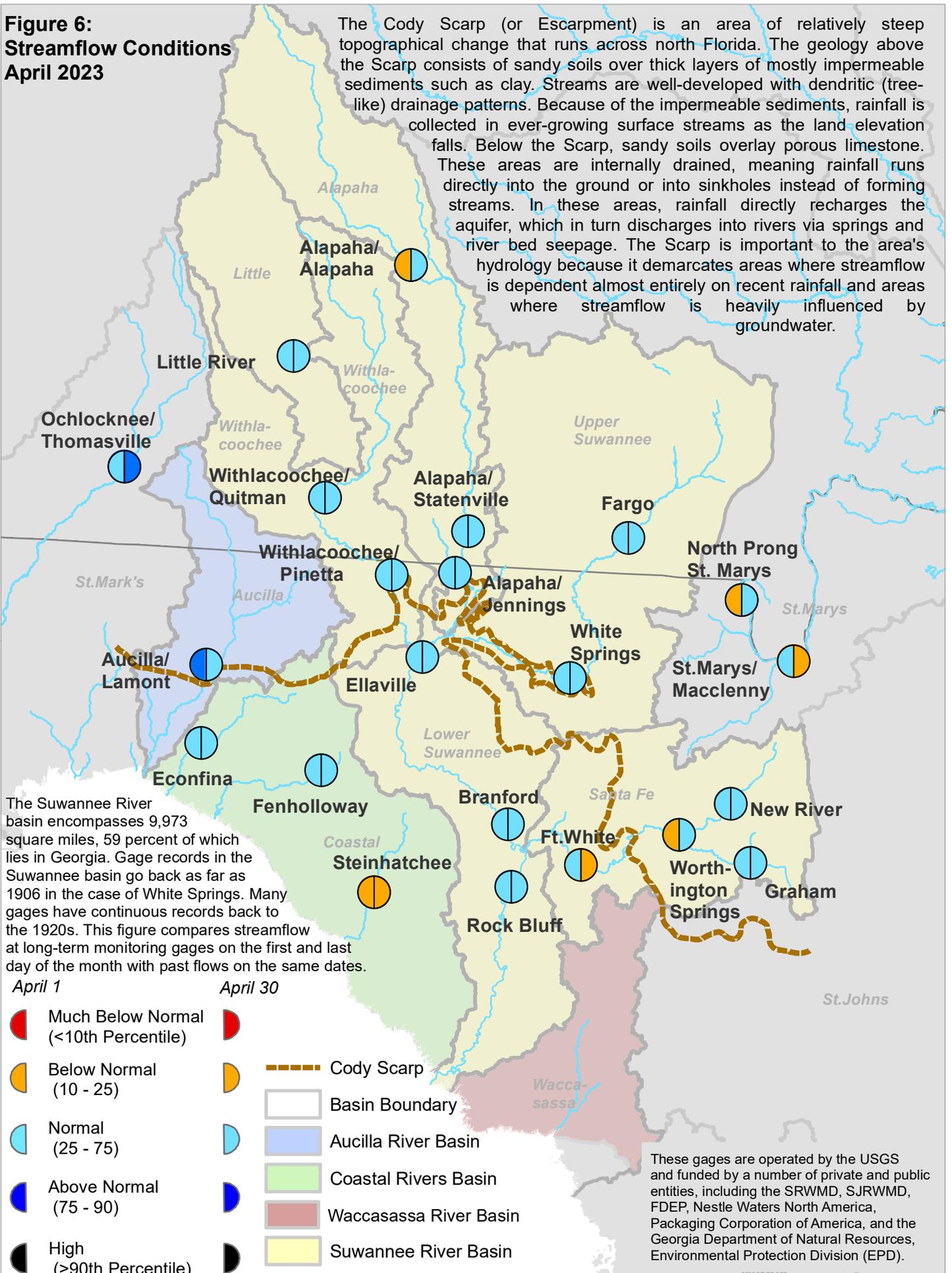
Figure 5, cont.: Daily River Flow Statistics

May 1, 2022 through April 30, 2023



**Figure 6:
Streamflow Conditions
April 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.

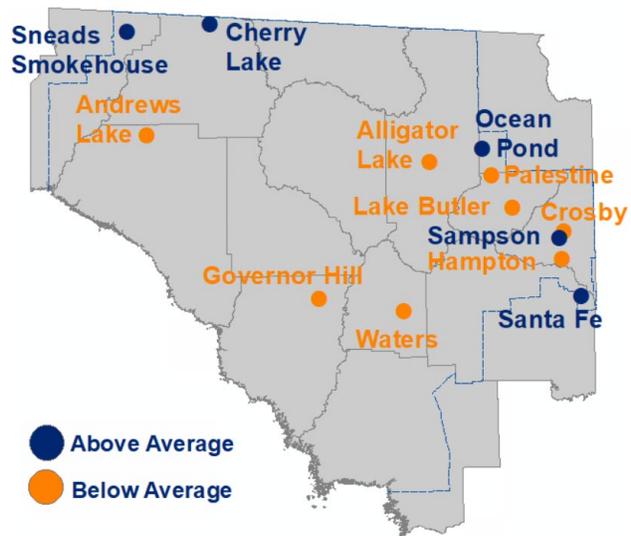
- April 1

April 30

- Cody Scarp
- Basin Boundary
- Aucilla River Basin
- Coastal Rivers Basin
- Waccasassa River Basin
- Suwannee River Basin

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: April 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

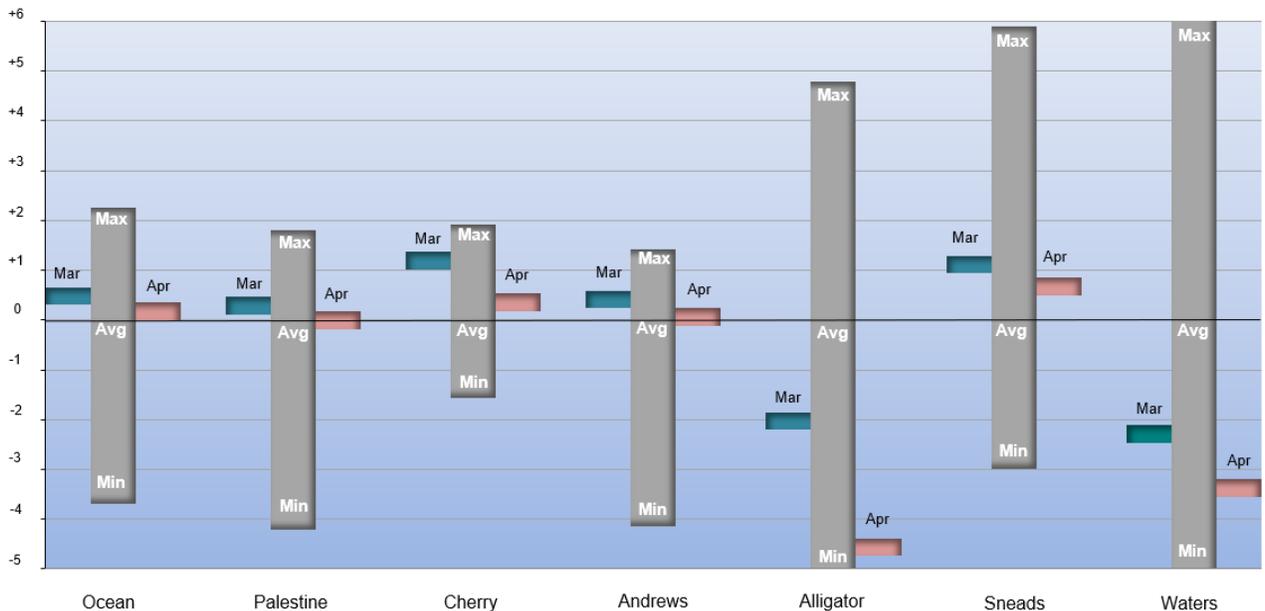


Figure 8: Flow Over the Past 12 Months, Lafayette Blue Springs (cubic feet per second)

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

Period 12 Month 05/01/2022 to 05/01/2023

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

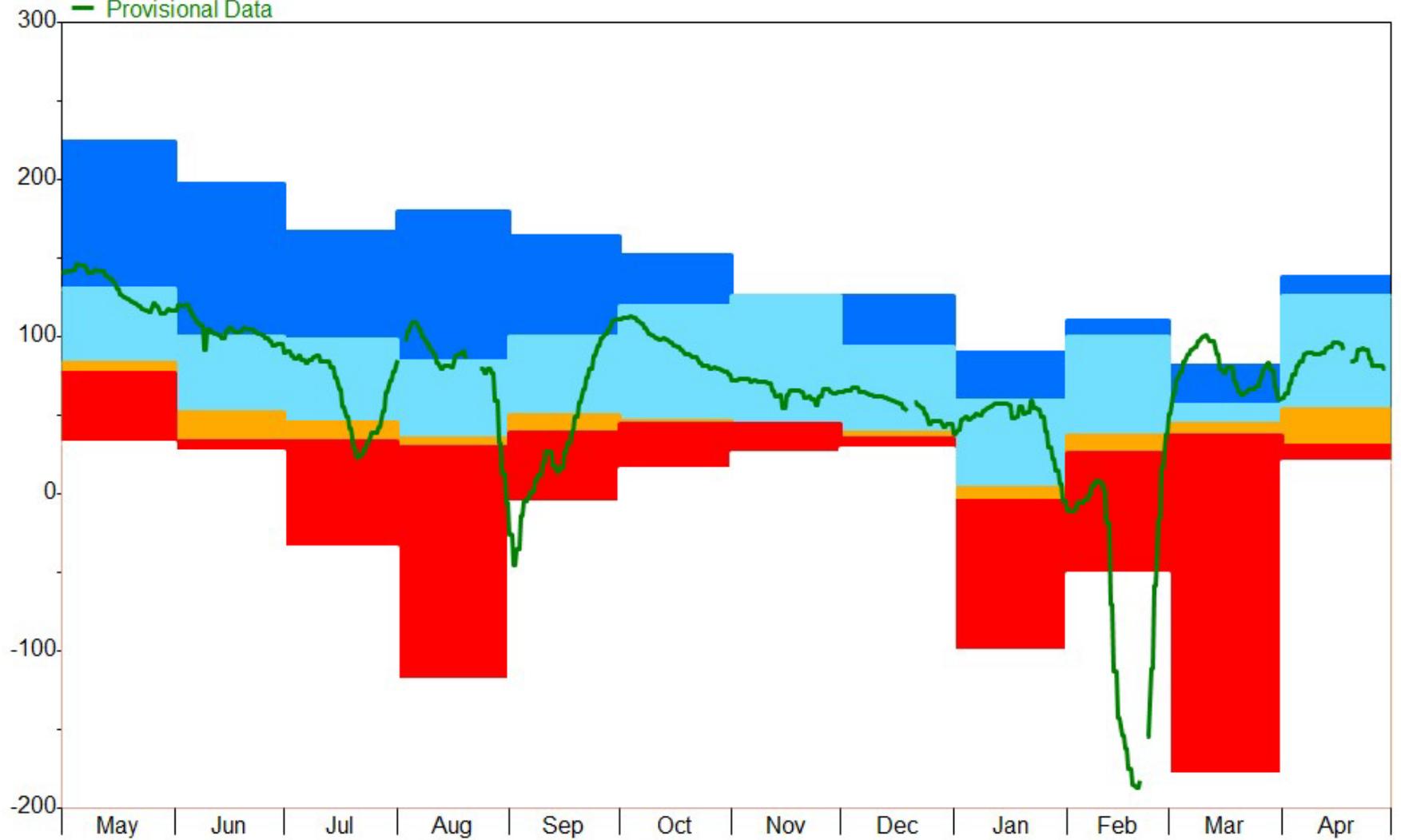


Figure 9: Flow Over the Past 12 Months, Fanning Springs (cubic feet per second)

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

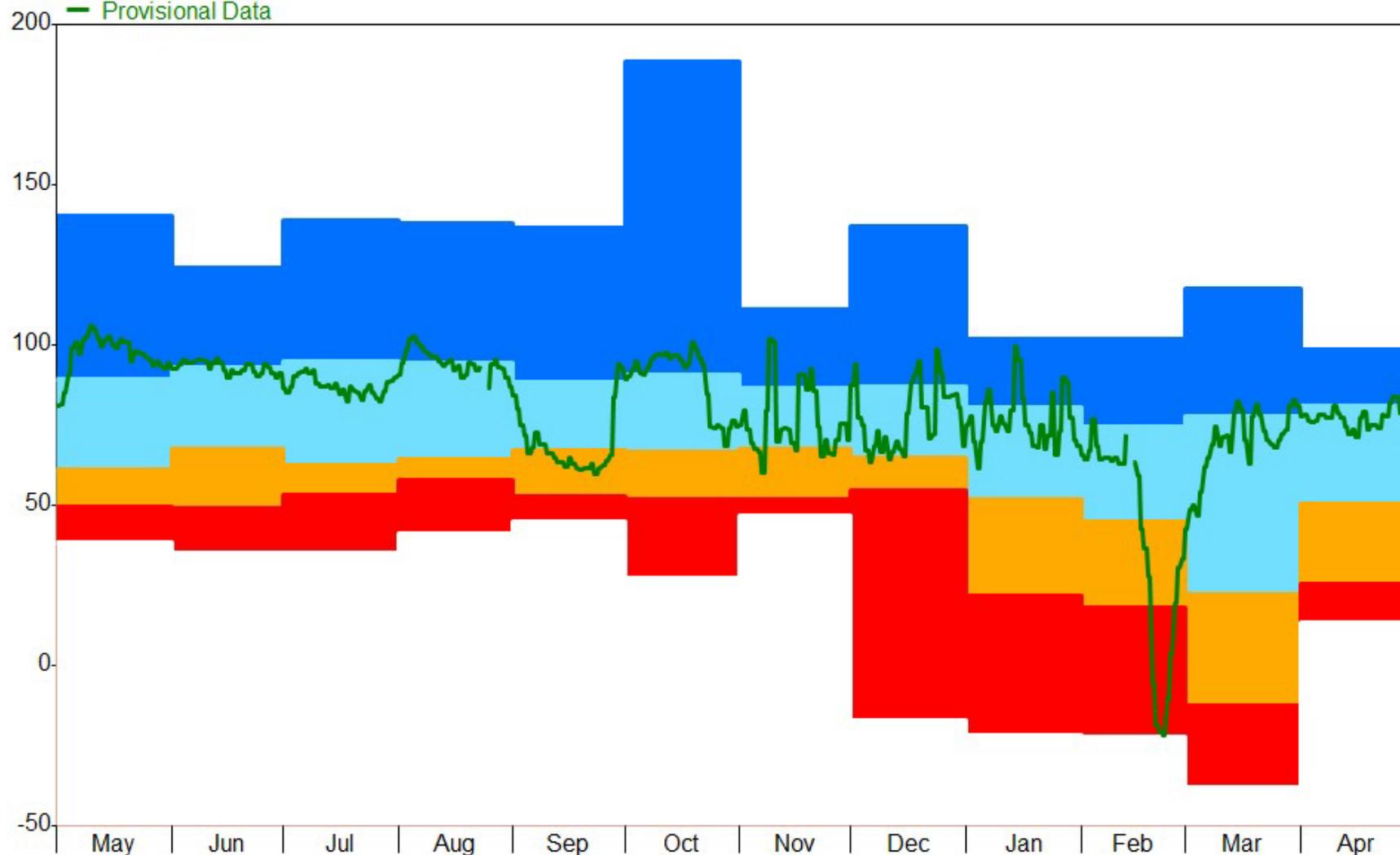
Period 12 Month 05/01/2022 to 05/01/2023

2022-23

Percentile statistics are calculated using data from 10/01/1930 to 09/30/2022

FANNING SPRINGS

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



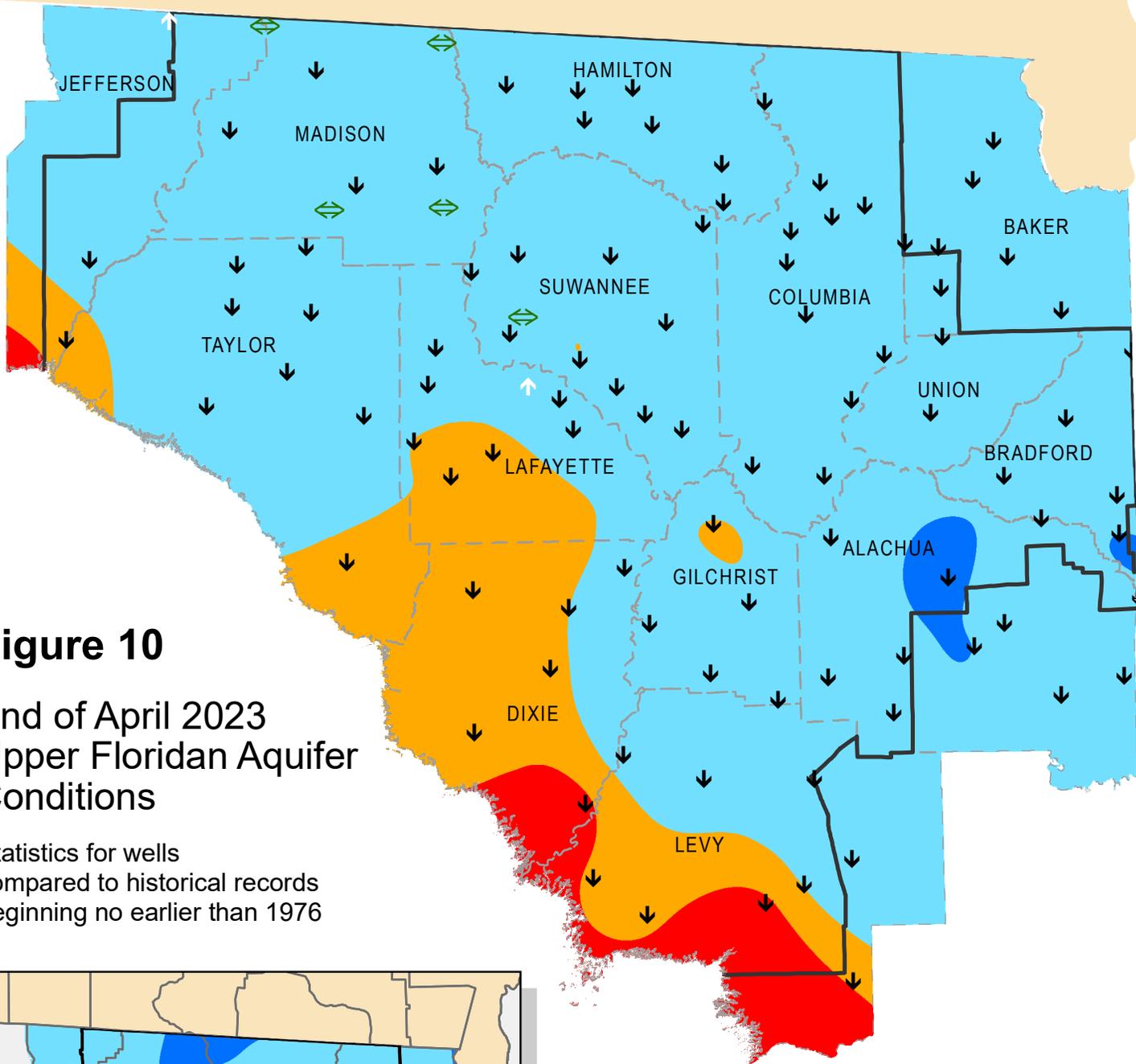
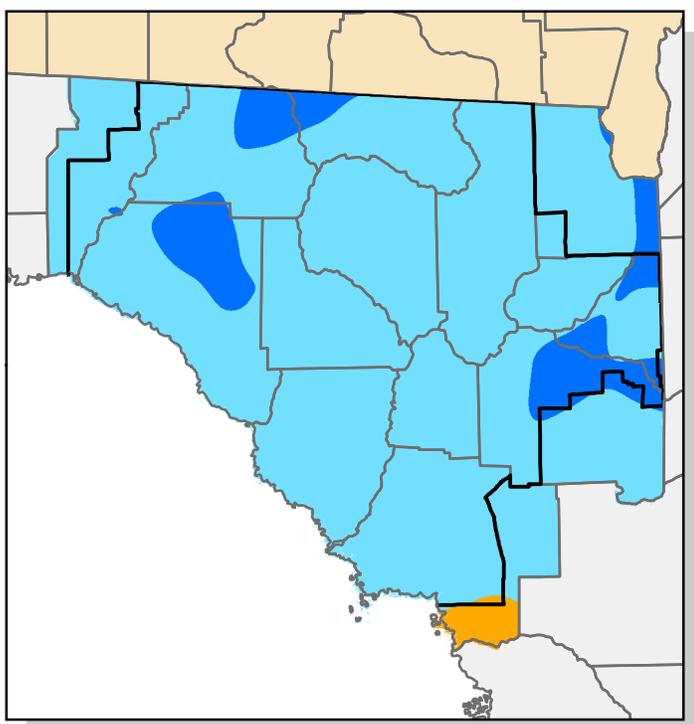


Figure 10

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

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



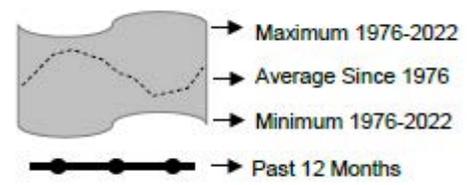
Inset: March Groundwater Percentiles

Additional wells courtesy of SJRWMD, SWFWMD and USGS

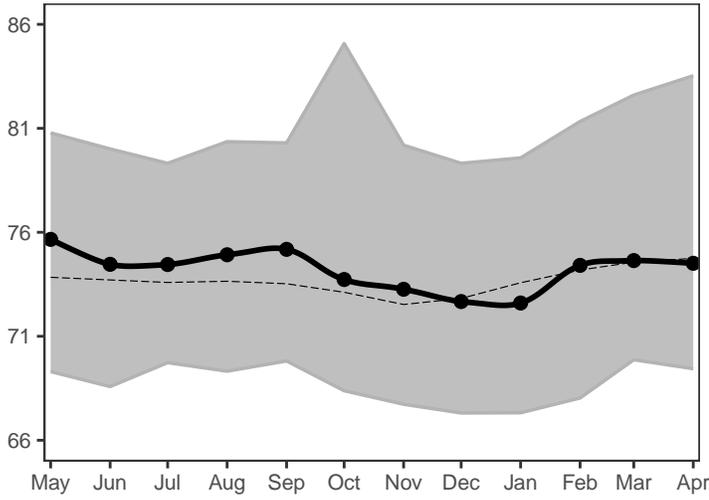
- Extremely High
(Greater than 90th Percentile)
- High
(75th to 90th Percentile)
- Normal
(25th to 75th Percentile)
- Low
(10th to 25th Percentile)
- Extremely Low
(Less than 10th Percentile)
- ↑ ↓ Increase/decrease in level since last month
- ↔ Increase/decrease since last month less than one percent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

Figure 11: Monthly Groundwater Statistics

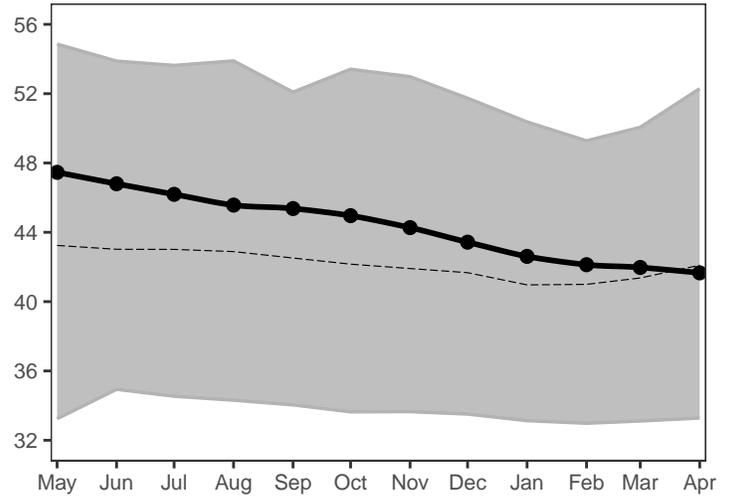
Levels May 2022 through April 2023
 Period of Record Beginning 1976



Madison County N010719001
near Greenville

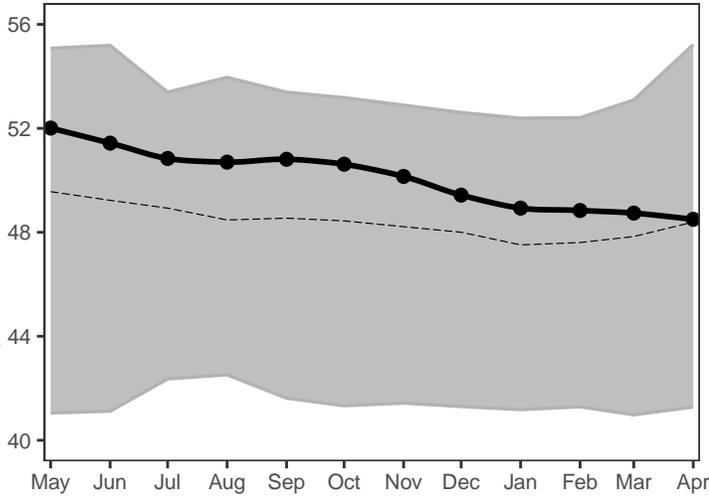


Suwannee County S021335001
near Live Oak

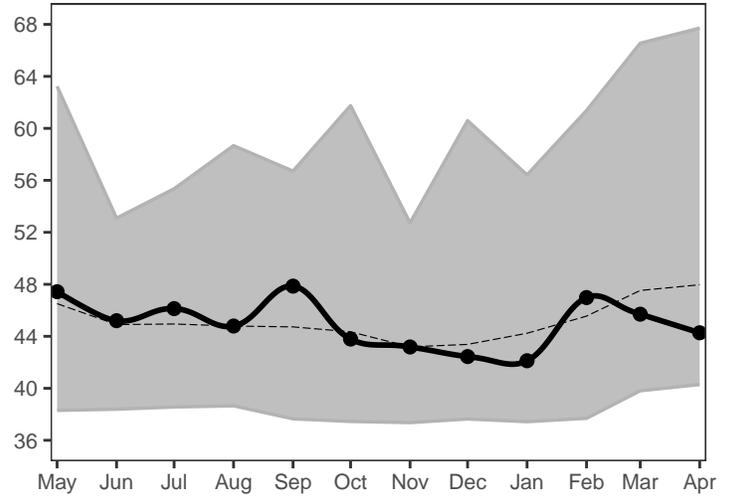


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

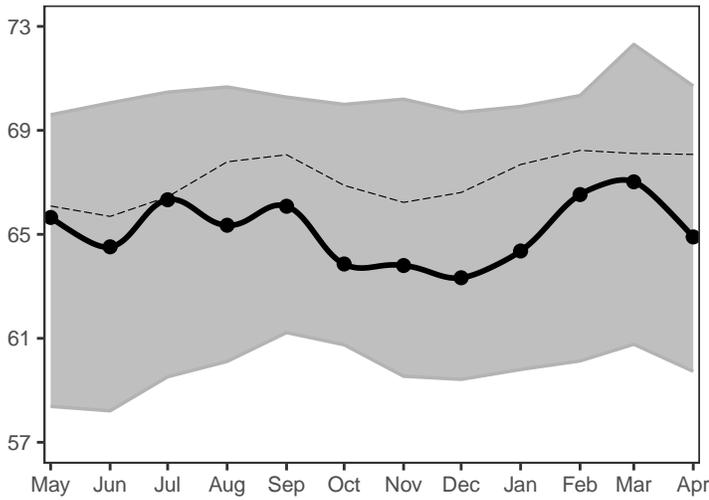
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S040736005
Perry

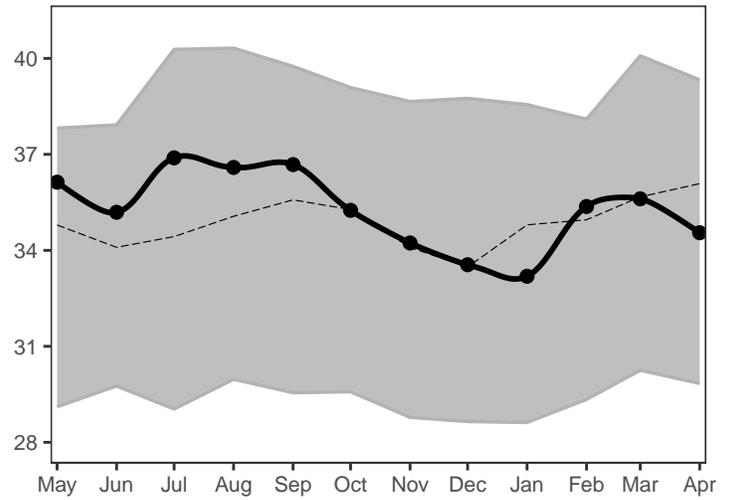
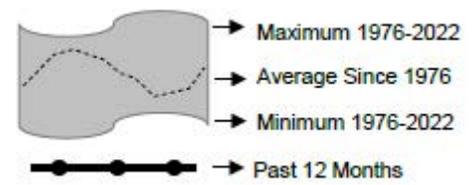
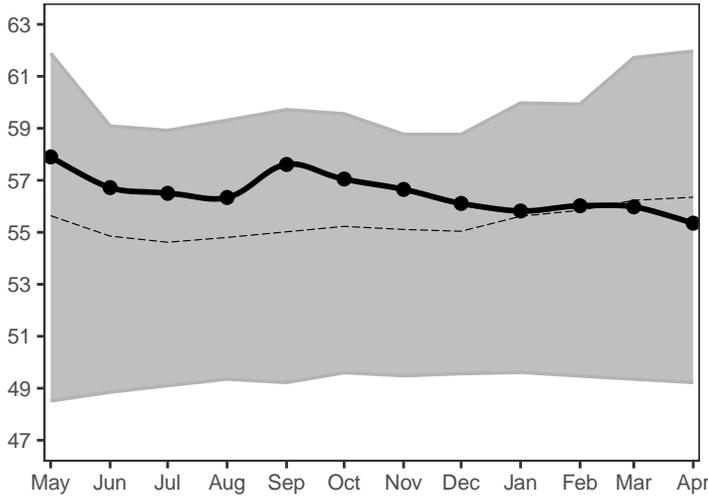


Figure 11, cont.: Monthly Groundwater Statistics

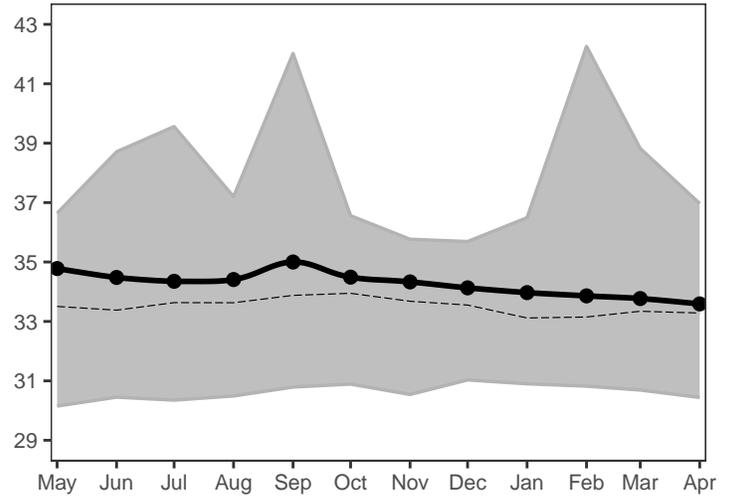
Levels May 2022 through April 2023
 Period of Record Beginning 1976



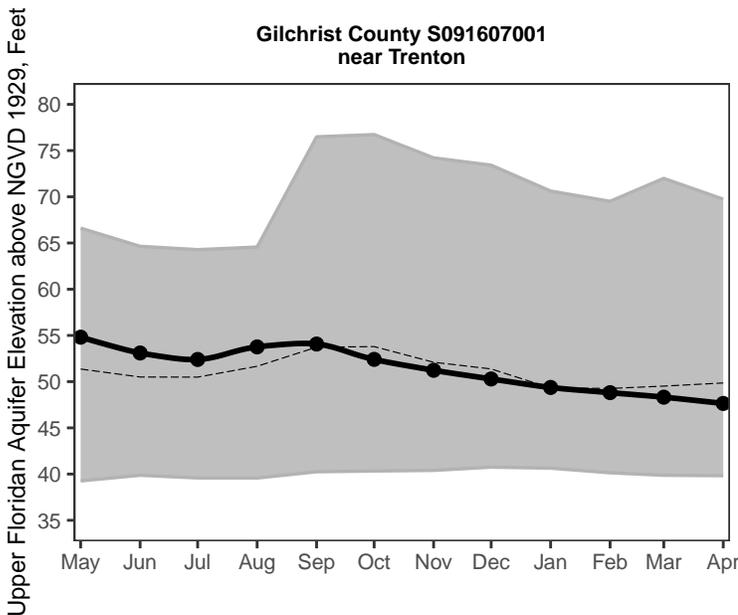
Union County S051933001
near Lake Butler



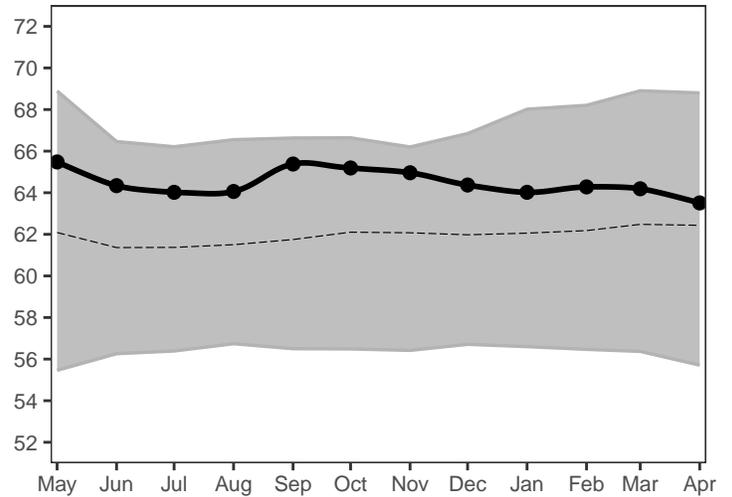
Alachua County S081703001
at High Springs



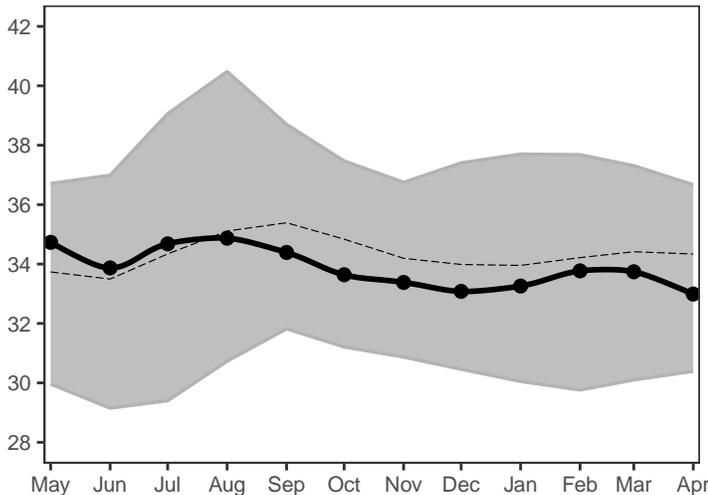
Gilchrist County S091607001
near Trenton



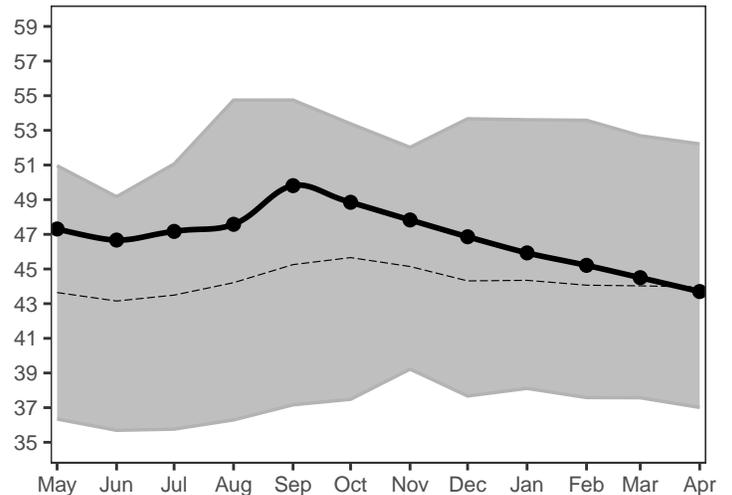
Bradford County S072132001
near Graham

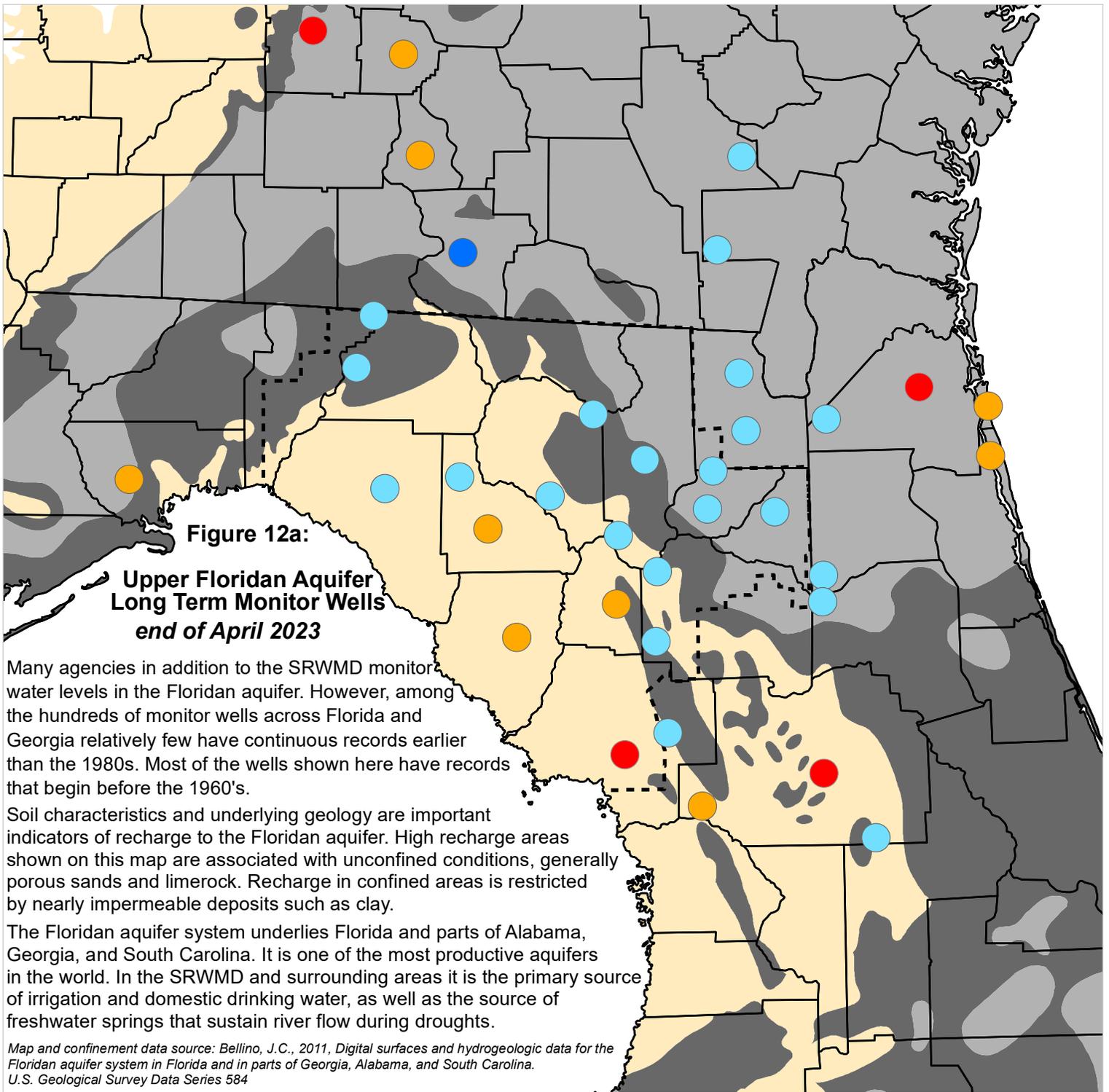


Dixie County S101210001
at Cross City



Levy County S131736001
near Bronson





Occurrence of Confined and Unconfined Conditions in the Upper Floridan Aquifer

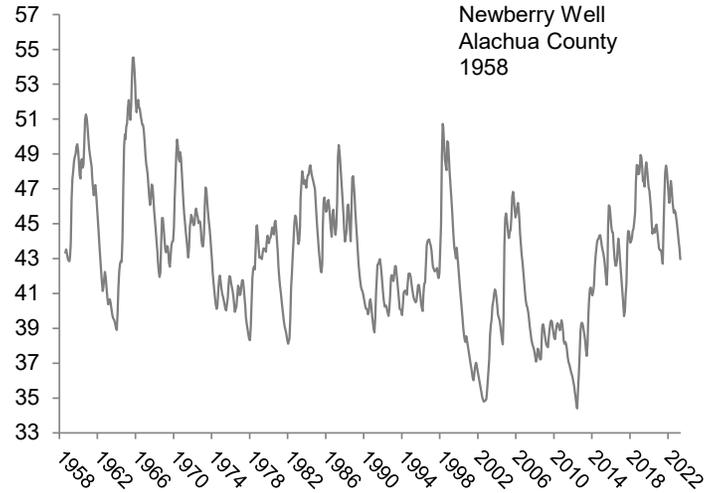
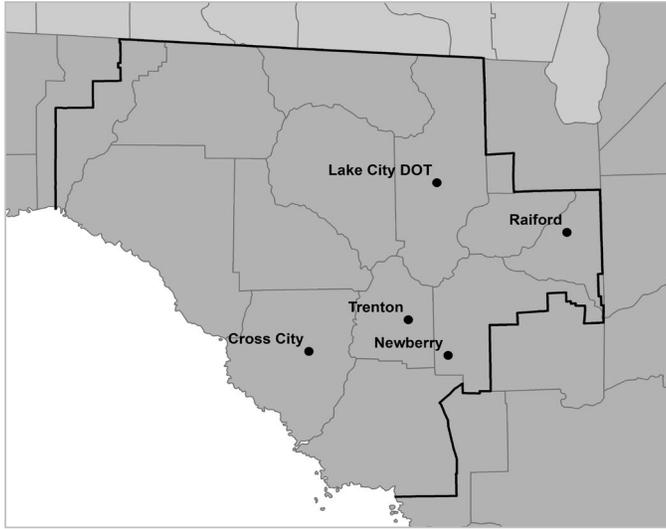
-  Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
-  Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
-  Unconfined: Upper confining unit is absent or very thin. Recharge is high.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



Upper Floridan Aquifer Elevation above NGVD 1929, Feet

