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, 2024

RE: June 2024 Hydrologic Conditions Report

RAINFALL

- Districtwide average rainfall for the month was 3.05", which is about 55 percent less than the 1932-2023 average of 6.79" (Table 1, Figure 1). The 12-month period ending June 30 reflected a Districtwide rainfall deficit of 1.38", which represented a large decrease in the 7.69" surplus seen at the end of May. Most District counties received anywhere between 2" and 4" of rainfall on average, with large areas of Hamilton, Suwannee, Taylor, Dixie, Levy, Alachua, Bradford, and Union counties receiving more than 6" of rainfall (Figure 2).

- Overall, a 12-month rainfall surplus was present for each basin except the Santa Fe and Waccasassa Basins, which had large deficits at the end of June (Figure 3). Areas of twelve-month surpluses greater than 10" were represented in 3 of the basins, while portions with deficits of greater than 14" were also seen in 4 of the river basins. Most of the basins also had 3-month rainfall deficits with only the Aucilla Basin showing a surplus by the end of the month (Figure 4). Areas of surpluses greater than 5 inches were prevalent in the northern part of the District, while portions with greater than 8" deficits were seen in the southern Waccasassa Basin over the past 3 months.

SURFACE WATER

- **Rivers:** Most river gages finished the month in the normal (25^{th} – 75^{th} percentile) flow range with most falling drastically since last month (Figure 5). Other rivers throughout South Georgia and North Florida also finished the month in either the normal or below normal (10^{th} – 25^{th} percentile) flow categories (Figure 6) due to below average rainfall throughout June. Both the Santa Fe River near Ft. White and the Steinhatchee River gages ended the month in the below normal ranges after beginning the month with normal or above normal (75^{th} - 90th percentile) flows.

- **Lakes**: Water levels decreased at most of the monitored lakes in the District this month (Figure 7). The median decrease in stage across all measured lakes was around 0.6', with 10 of the lakes ending the month below their respective long-term average. Snead's Smokehouse Lake represented the largest water level decrease among lakes this month with a drop of about 2.5'.

- **Springs**: Flow measurements were made at 13 springs in June by the U.S. Geological Survey (USGS), District staff, and contractors. The Wacissa River began the month with flows in the normal range but decreased throughout June and ended with <10^{th} percentile flows (Figure 8). Blue Hole, however, spent the month in the normal flow category despite sporadically missing data points due to gaging issues (Figure 9).

GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District reflected conditions ranging from extremely high (>90th percentile) in the north to extremely low (<10th percentile) in the southern portions of the District (Figure 10). Overall, groundwater levels decreased by a median of 1.6' since the end of May and ended June with a Districtwide average around the 59th percentile.

Many index wells remained higher than their respective historical monthly average level at the end of the month (Figure 11). Long-term District UFA well levels ended the month in the very high, high, normal, low, or very low categories (Figure 12a). Long-term wells with records that extend back to at least 1964 showed mostly decreasing water levels this month relative to last month (Figure 12b).

CLIMATE AND DROUGHT OUTLOOK

ENSO-neutral conditions are present with a 65% chance of a La Niña development from July to September and continuing into winter 2024-25 (85% chance from November to January).

The NOAA three-month seasonal outlook suggests above normal temperatures along with above normal precipitation throughout the District from July through September 2024.

The U.S. Drought Monitor report released on Wednesday, July 3, 2024, shows the entire District with either Abnormally Dry (D0) or Moderate Drought (D1) conditions.

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 10, 2024, to November 3, 2024) 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, Kevin Posada, and Vince Robinson
- QA/QC and Reporting: Stephanie Armstrong, Susie Hetrick, Robbie McKinney, and Brandi Sistrunk
- Administrative Support/Document Preparation/IT: Paul Buchanan, Bo Cameron, 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 2024	June Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal*
Alachua	3.60	6.95	52%	44.25	84%
Baker	2.05	6.79	30%	52.43	99%
Bradford	4.08	6.62	62%	49.84	96%
Columbia	2.33	6.88	34%	50.37	95%
Dixie	3.43	7.27	47%	48.29	83%
Gilchrist	3.14	7.15	44%	43.53	80%
Hamilton	3.12	6.37	49%	59.15	114%
Jefferson	2.21	6.16	36%	60.24	108%
Lafayette	2.31	6.67	35%	54.64	99%
Levy	3.99	7.46	54%	46.06	82%
Madison	2.48	6.21	40%	63.36	119%
Suwannee	3.37	6.49	52%	55.87	105%
Taylor	2.90	6.65	44%	58.84	104%
Union	2.59	6.86	38%	49.57	94%

*Based on PRISM LT81 monthly rainfall averages by county (1927-2022)

June 2024 District Average	3.05
June Long-Term Average (1932-2023)	6.79
Historical 12-month Average (1932-2023)	54.71
Past 12-Month Total	53.33
12-Month Rainfall **Surplus**/Deficit	**-1.38**

Figure 1: Comparison of District-wide Monthly Rainfall

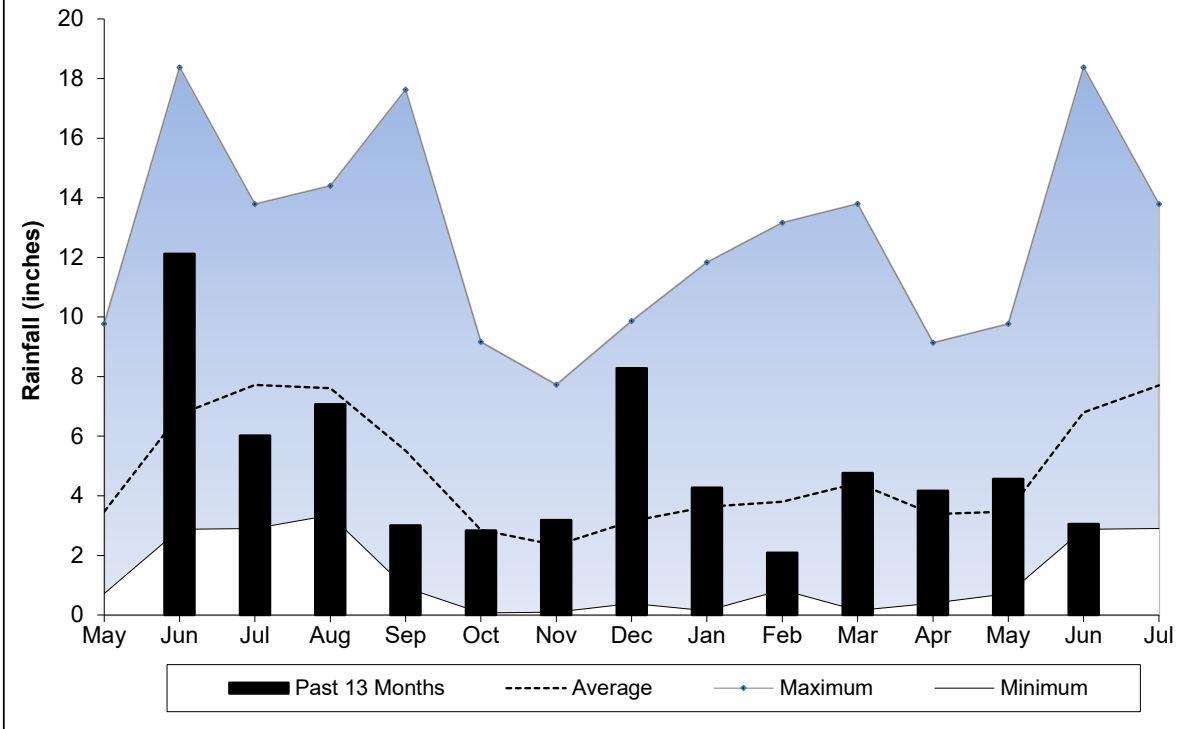


Figure 2: June 2024 SRWMD Gage-adjusted Radar Rainfall

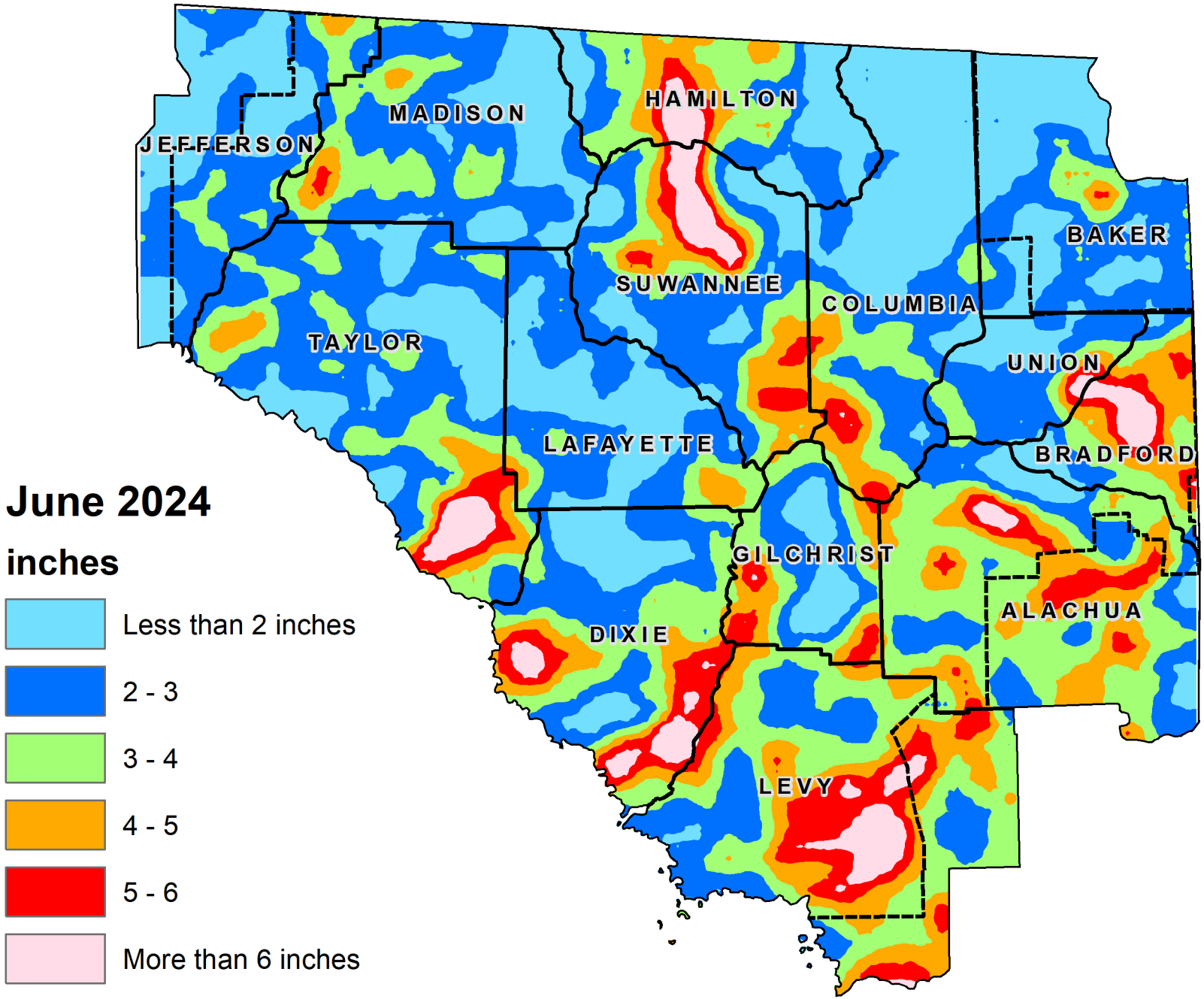
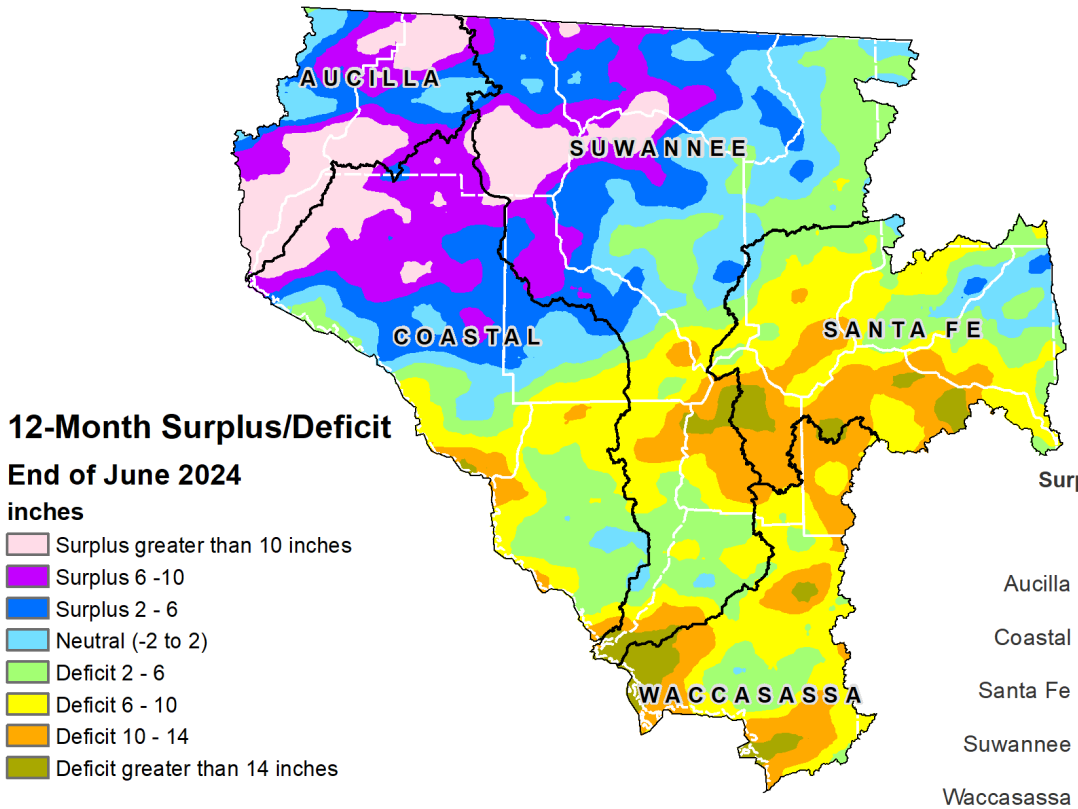


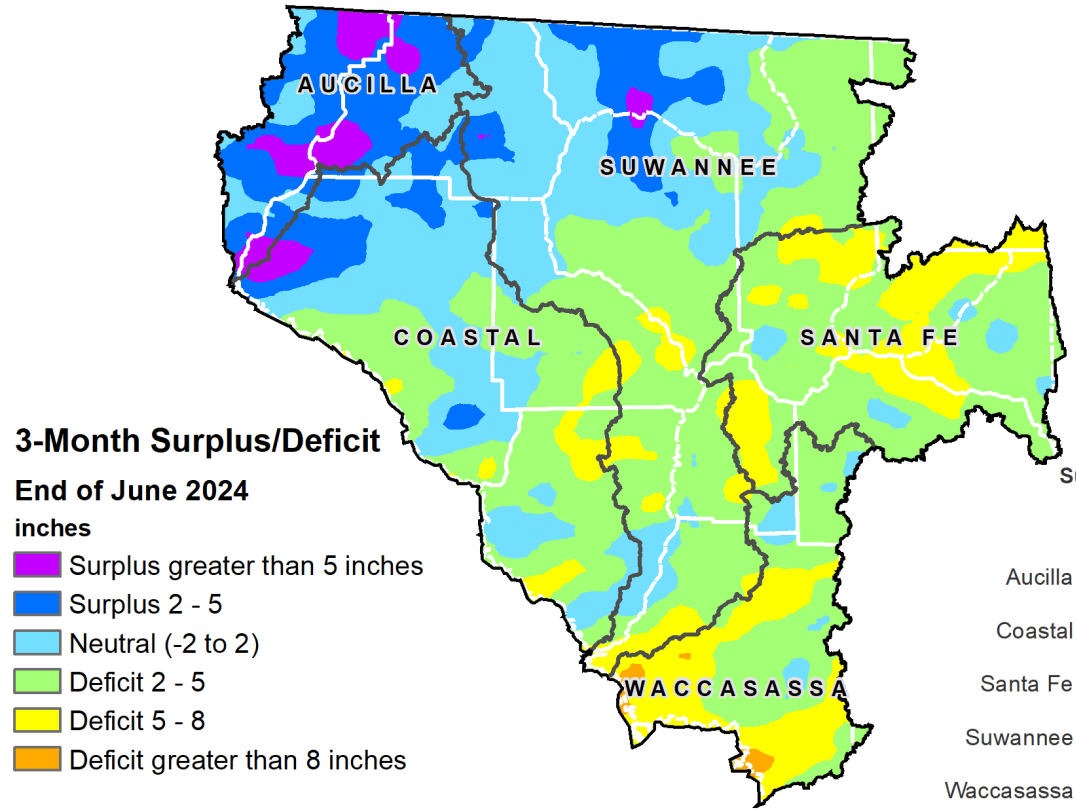
Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through June 30, 2024



12-Month Surplus (+) or Deficit (-) By Basin

	Jun 2024	May 2024
Aucilla	**+ 8.4**	+16.5
Coastal	**+ 0.6**	+11.9
Santa Fe	**- 7.5**	- 1.5
Suwannee	**+ 0.1**	+ 8.9
Waccasassa	**- 9.1**	+ 1.5

Figure 4: 3 - Month Rainfall Surplus/Deficit by River Basin through June 30, 2024

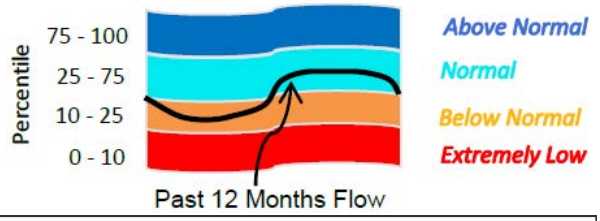


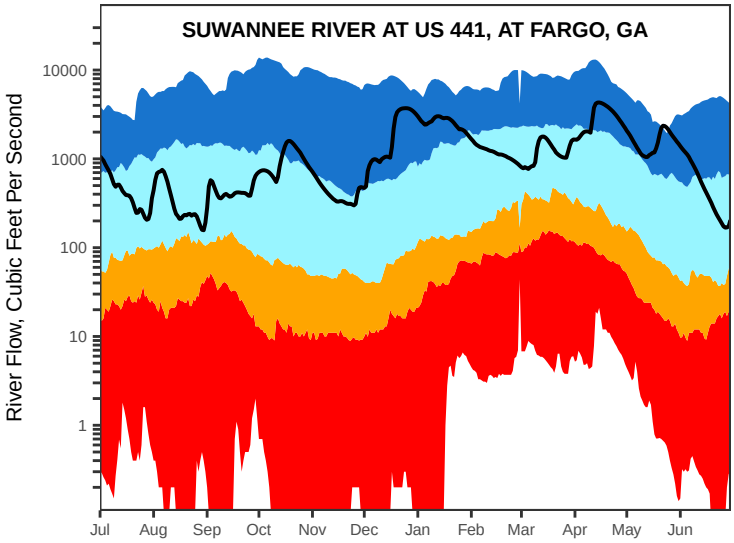
3-Month Surplus (+) or Deficit (-) By Basin

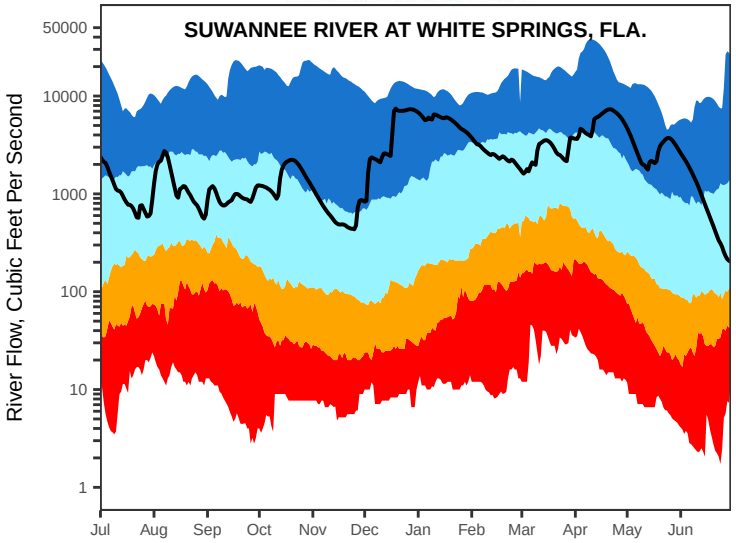
	Jun 2024	May 2024
Aucilla	+ 3.5	+ 8.5
Coastal	- 1.3	+ 3.1
Santa Fe	- 4.3	- 1.1
Suwannee	- 1.6	+ 3.1
Waccasassa	- 4.5	- 2.9

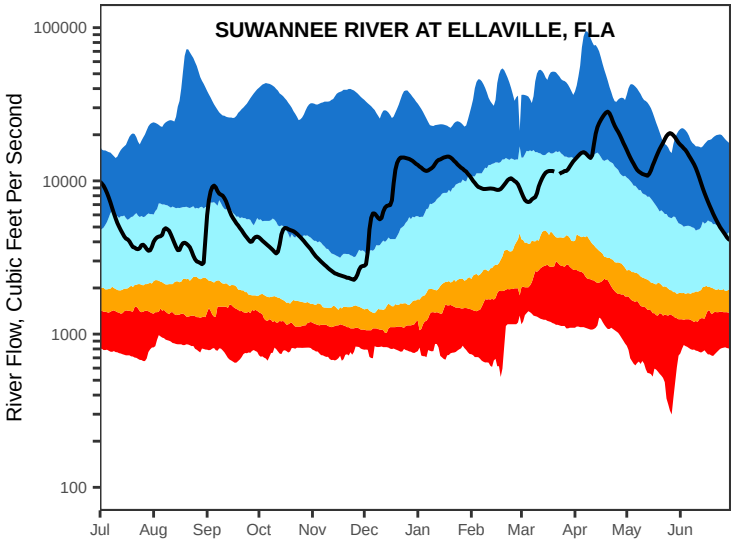
Figure 5: Daily River Flow Statistics

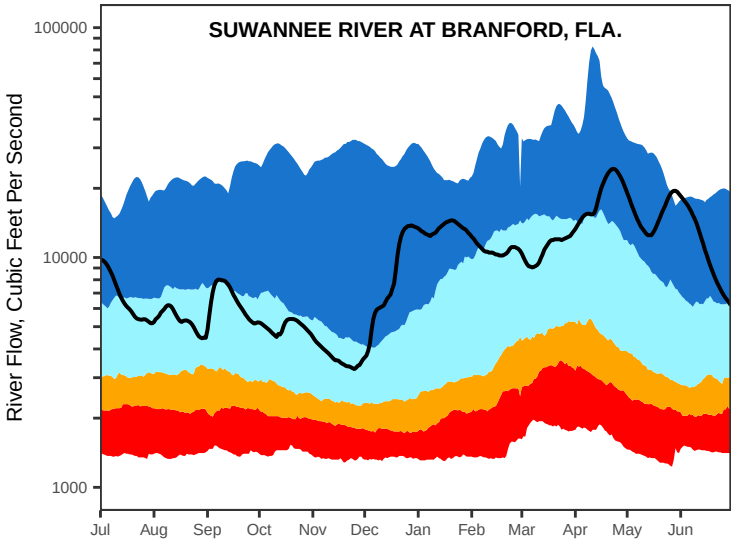
July 1, 2023 through June 30, 2024

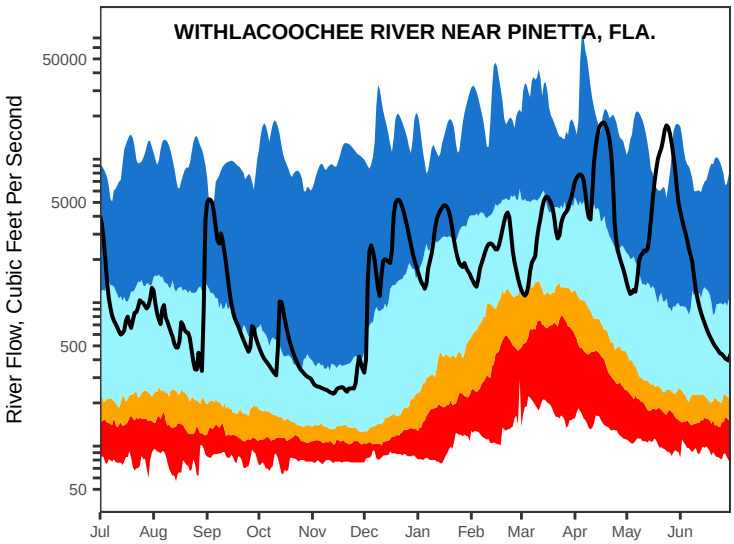












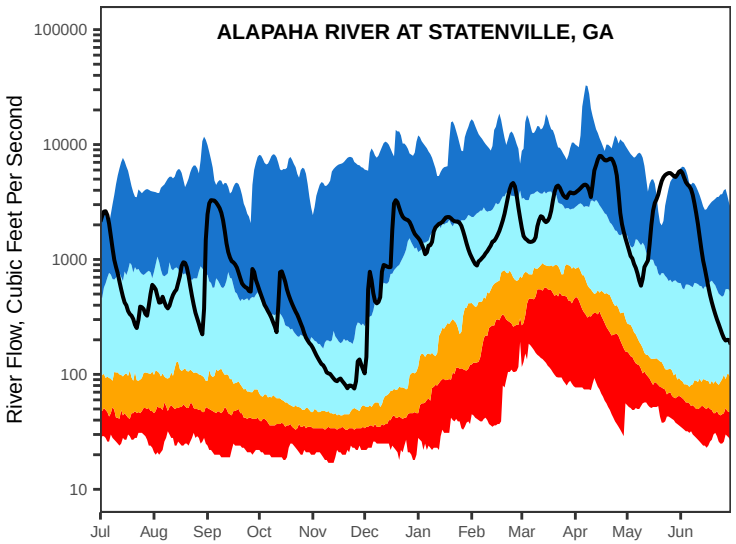
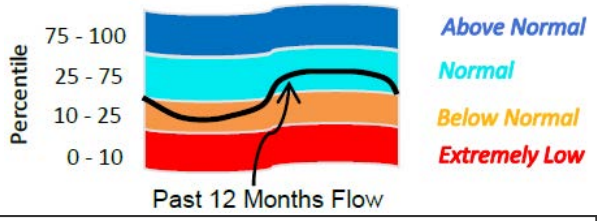
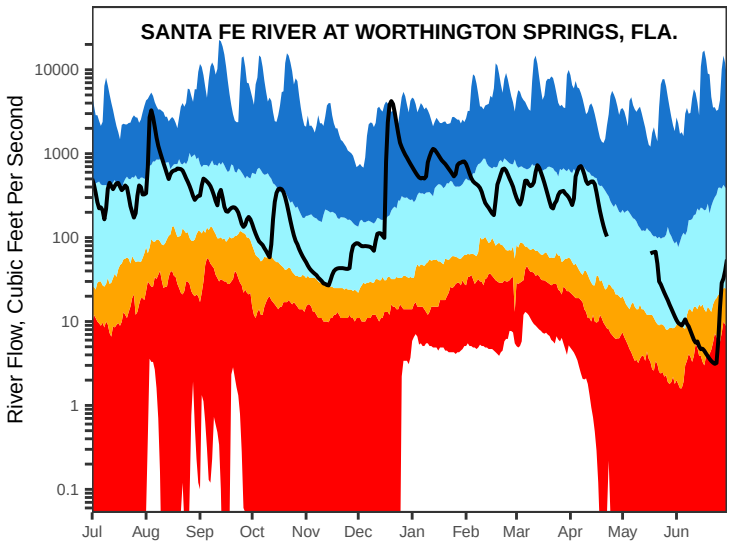
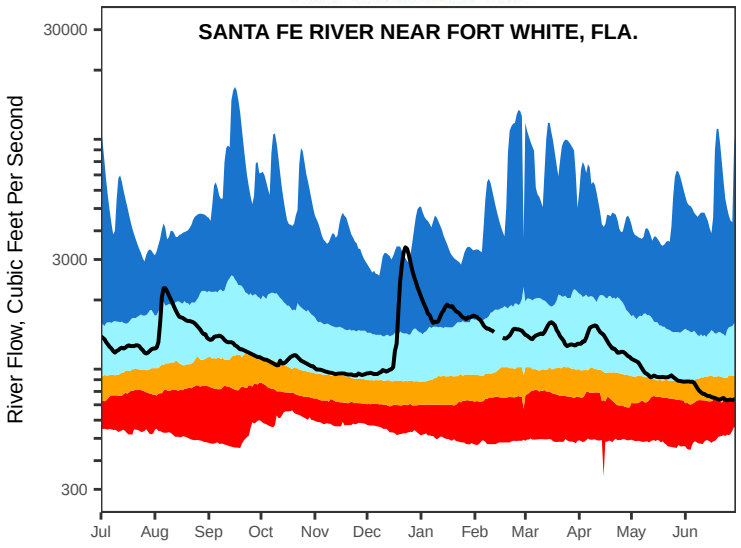


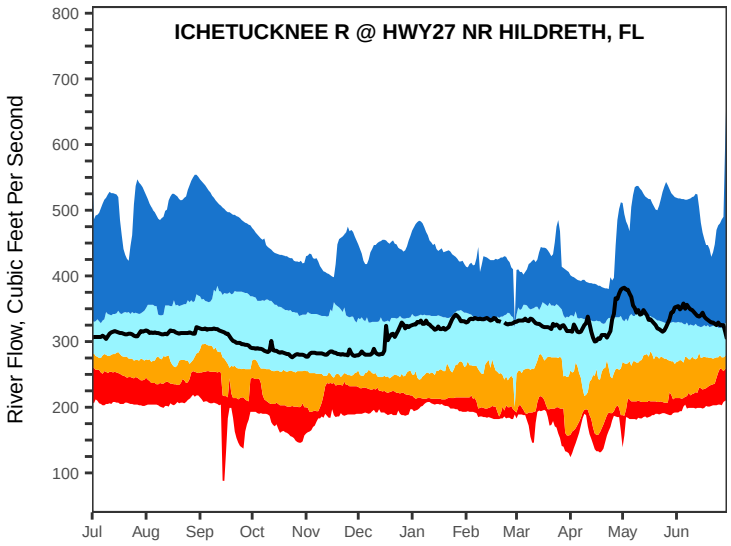
Figure 5, cont.: Daily River Flow Statistics

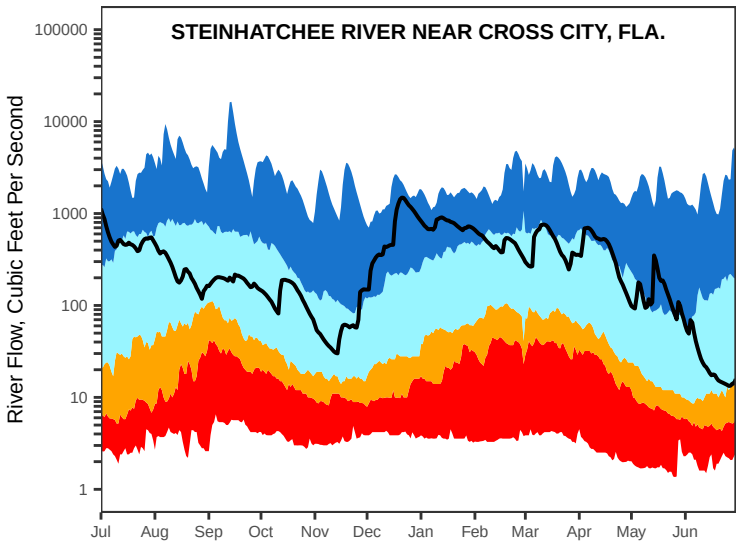
July 1, 2023 through June 30, 2024

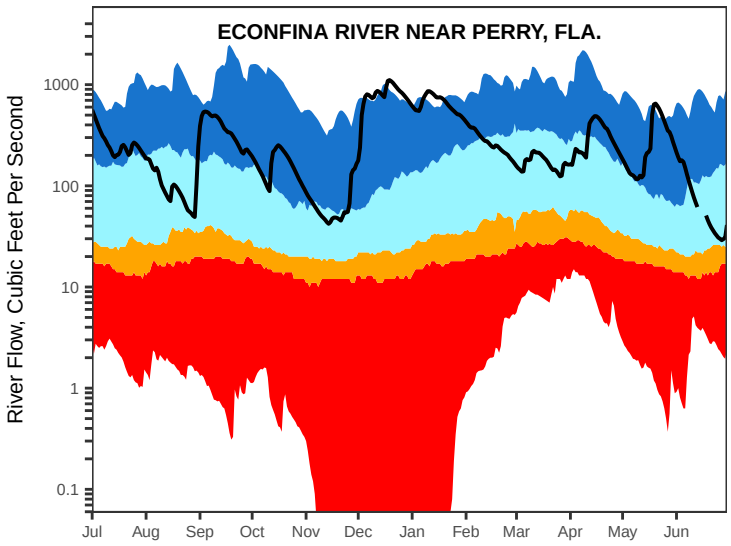












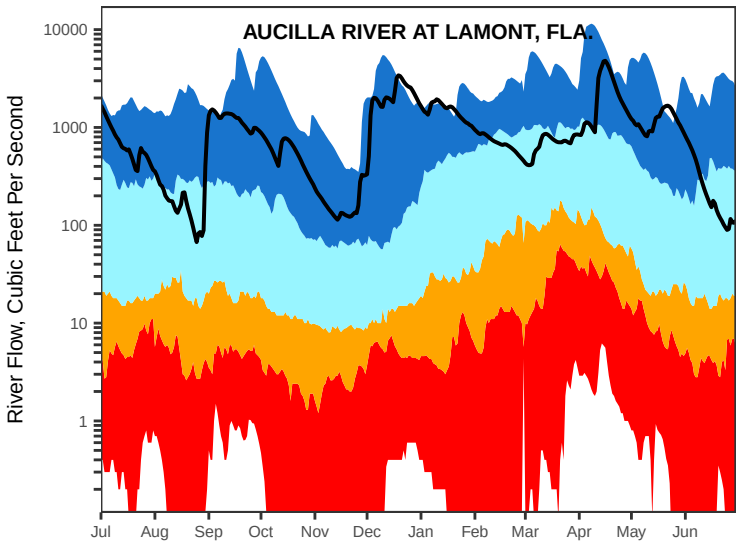
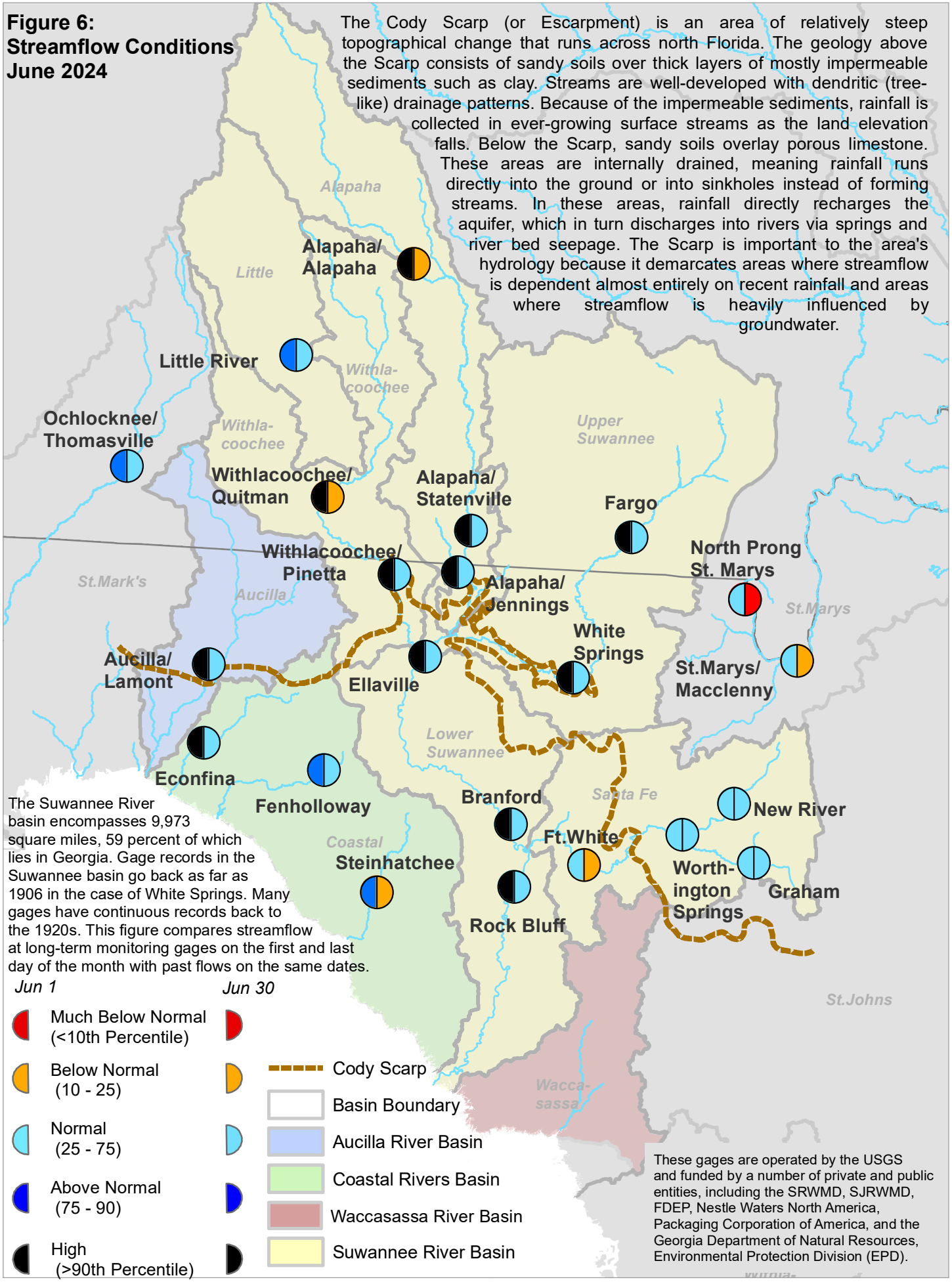


Figure 6:
Streamflow Conditions
June 2024

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.

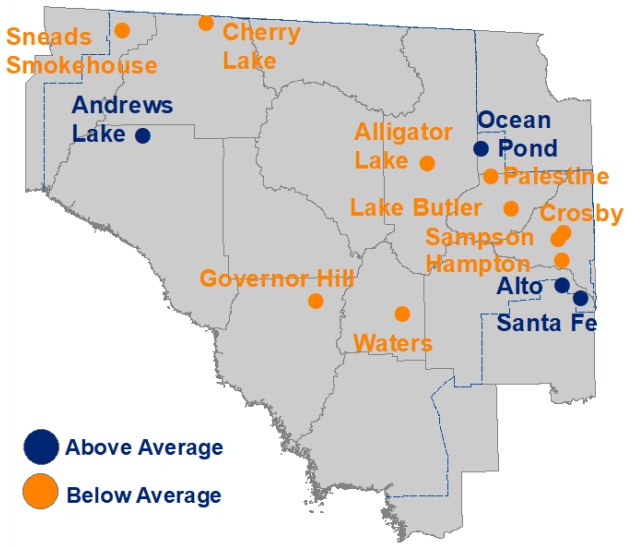


The Suwannee River basin encompasses 9,973 square miles, 59 percent of which lies in Georgia. Gage records in the Suwannee basin go back as far as 1906 in the case of White Springs. Many gages have continuous records back to the 1920s. This figure compares streamflow at long-term monitoring gages on the first and last day of the month with past flows on the same dates.

Jun 1	*Jun 30*	
Much Below Normal (<10th Percentile)		
Below Normal (10 - 25)		Cody Scarp
Normal (25 - 75)		Basin Boundary
Above Normal (75 - 90)		Aucilla River Basin
High (>90th Percentile)		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: June 2024 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.

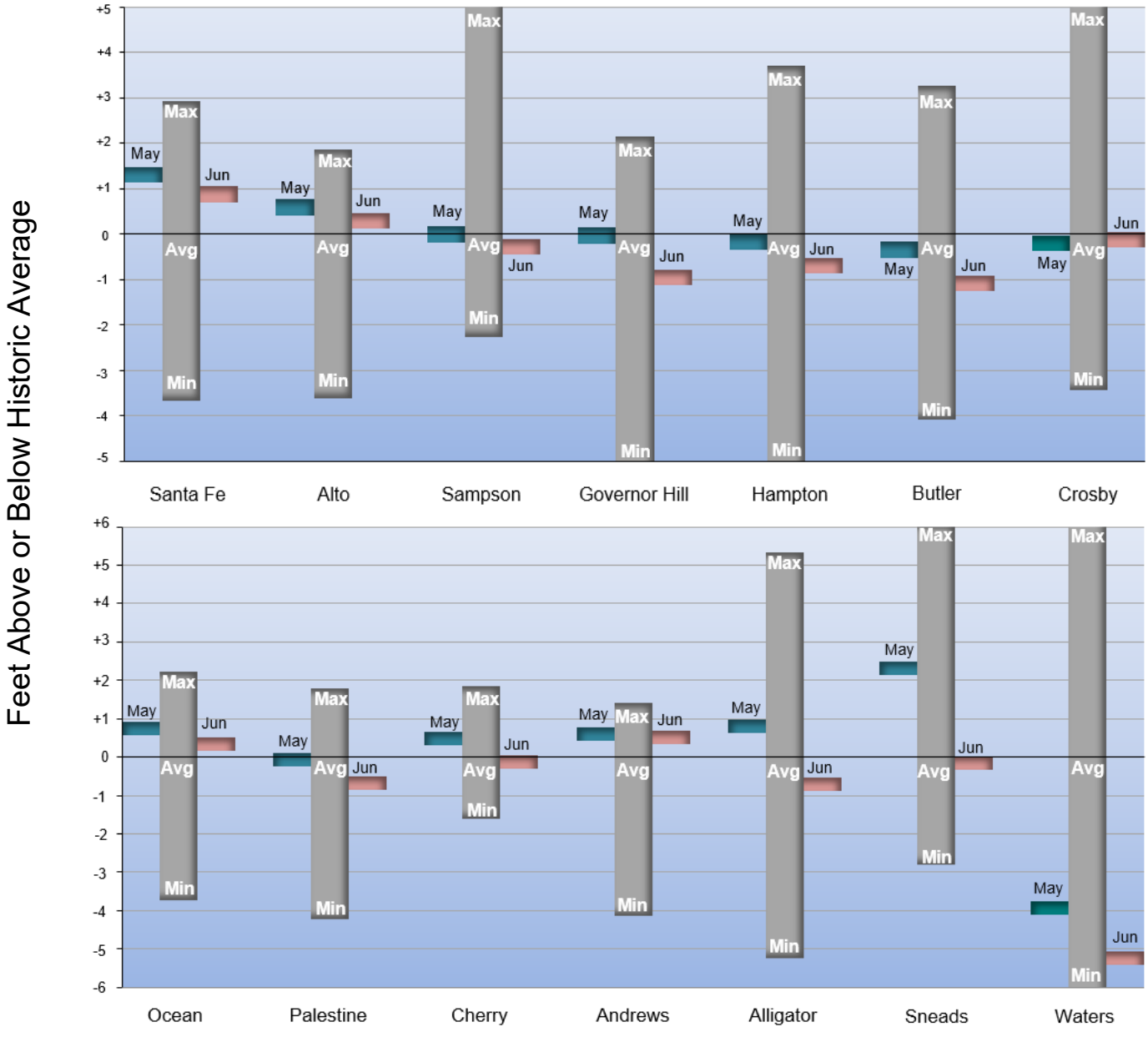


Figure 8: Flow Over the Past 12 Months, Wacissa River (cubic feet per second)

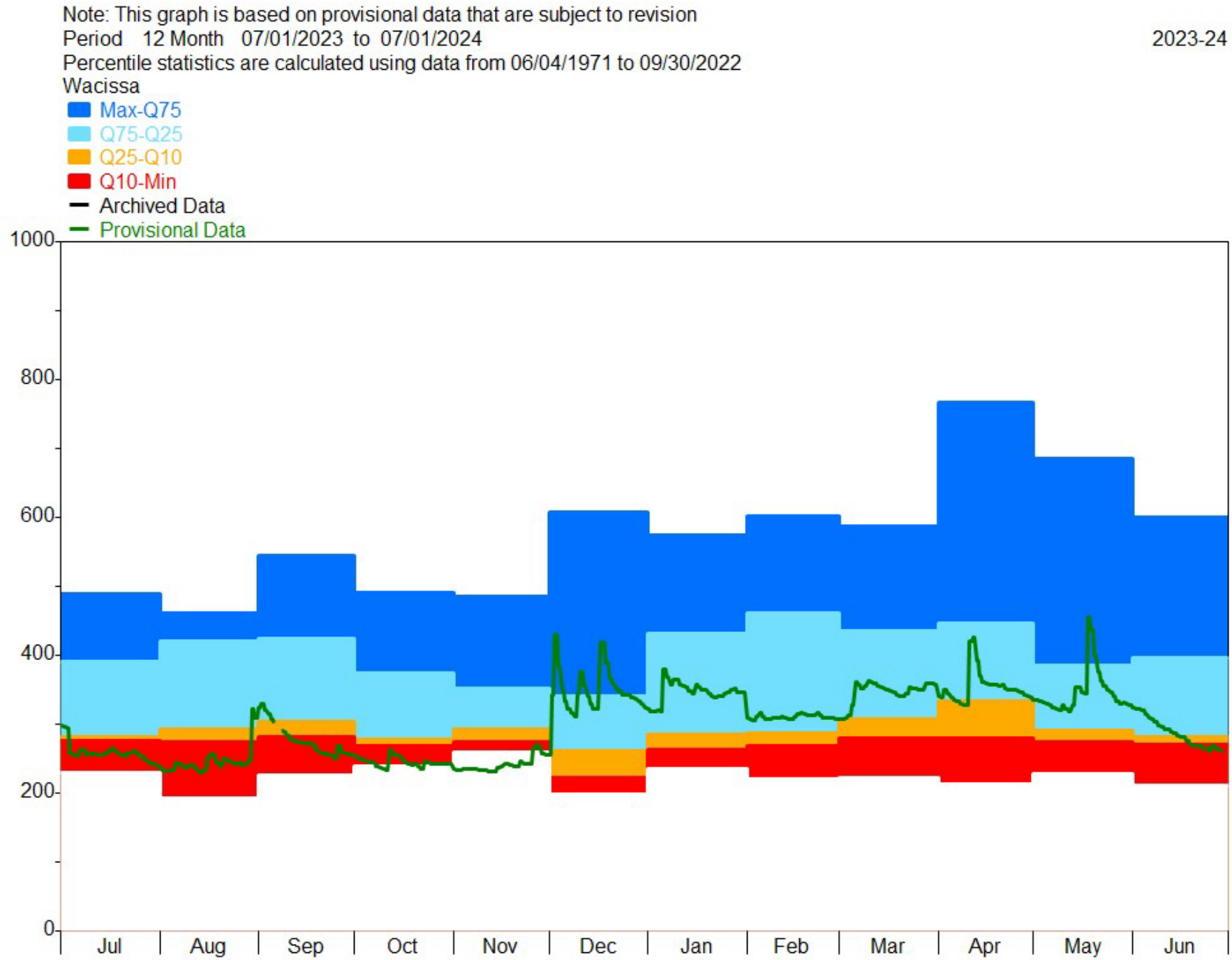
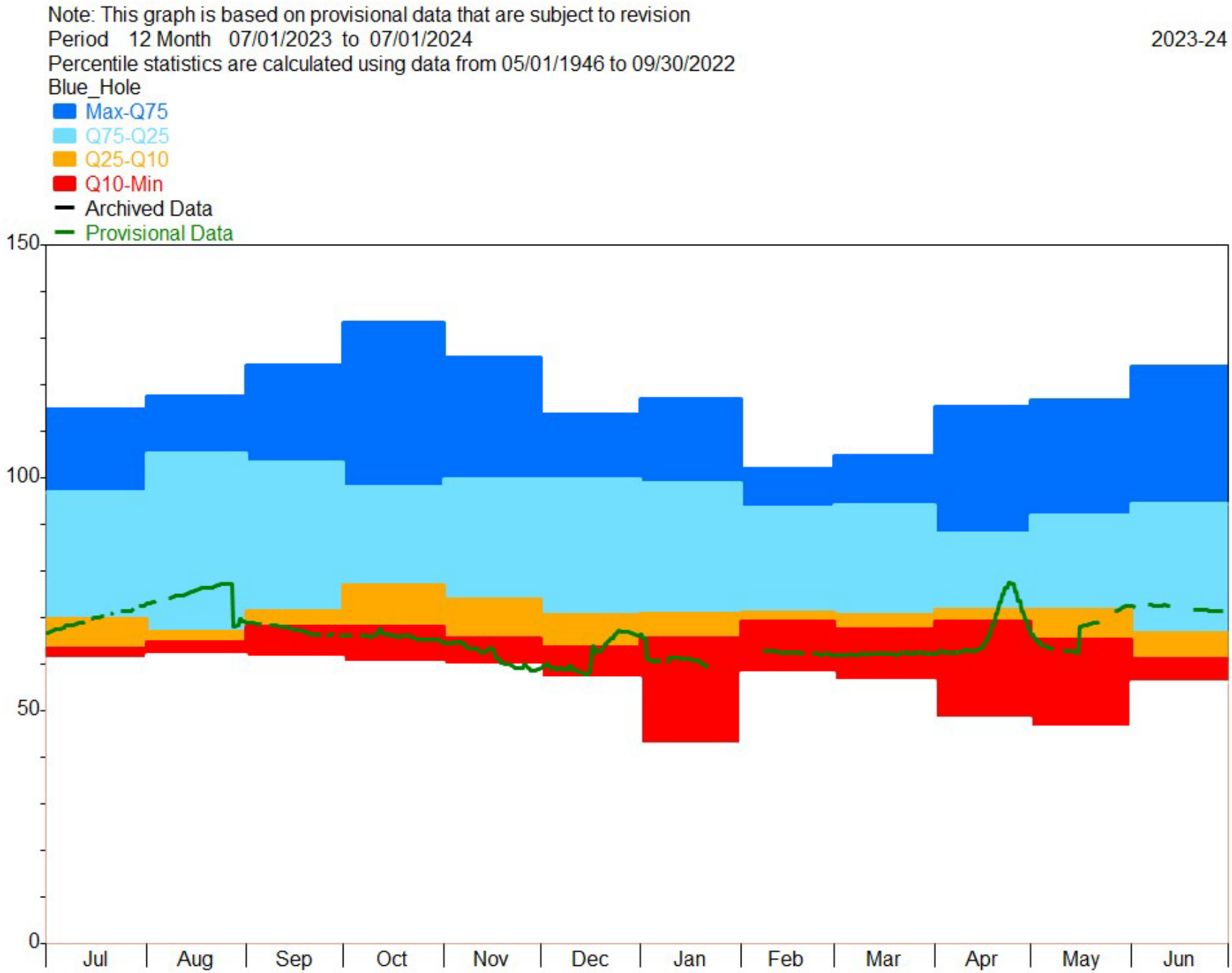


Figure 9: Flow Over the Past 12 Months, Blue Hole (cubic feet per second)



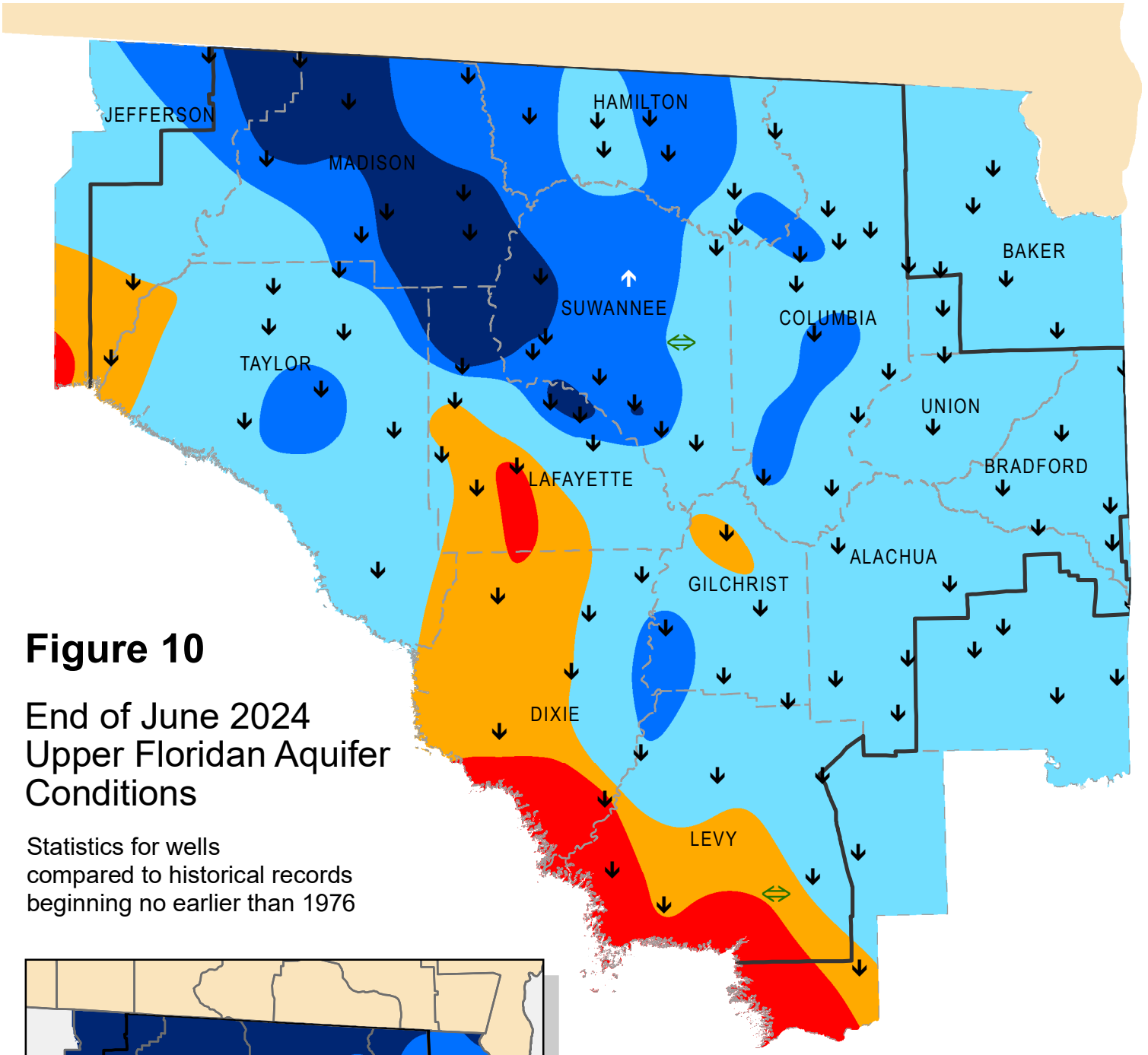
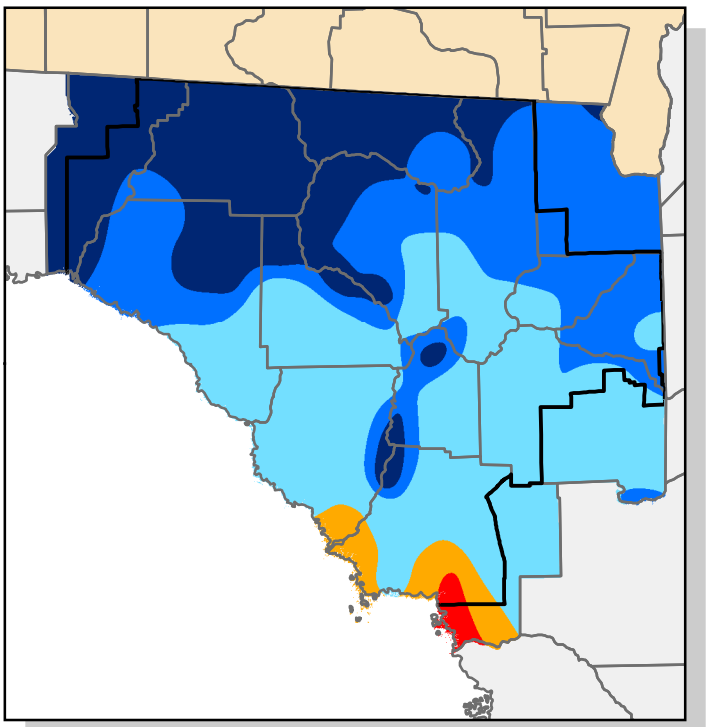


Figure 10

End of June 2024 Upper Floridan Aquifer Conditions

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



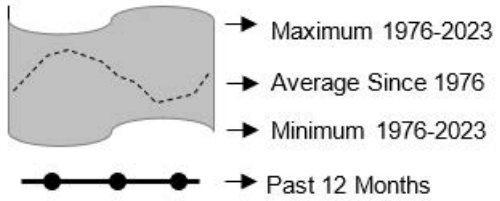
Inset: May Groundwater Percentiles

Additional wells courtesy of SJRWMD, SWFWMD and USGS

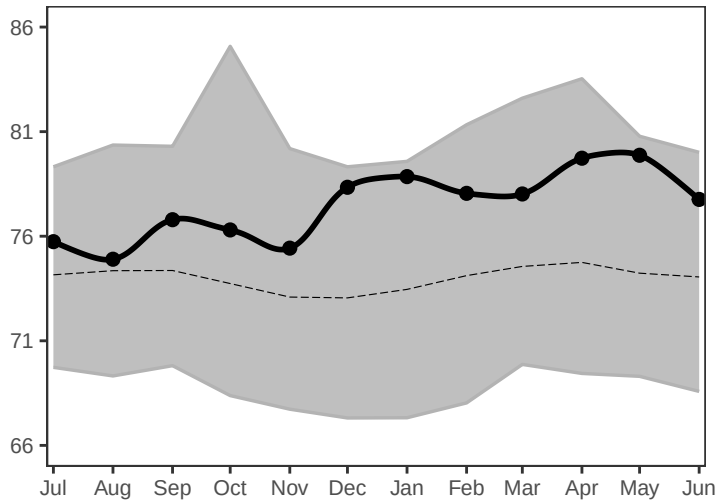
- Extremely High (Greater than 90th Percentile)
- High (75th to 90th Percentile)
- Normal (25th to 75th Percentile)
- Low (10th to 25th Percentile)
- Extremely Low (Less than 10th Percentile)
- Increase/decrease in level since last month
- Increase/decrease since last month less than one percent of historic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

Figure 11: Monthly Groundwater Statistics

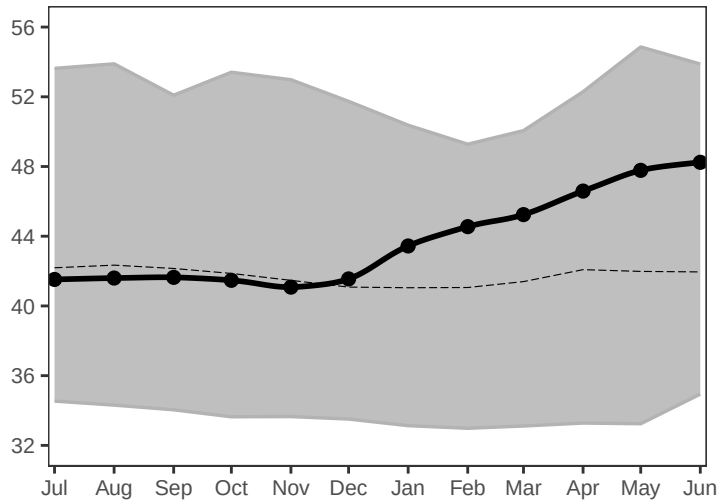
Levels July 2023 through June 2024
Period of Record Beginning 1976



Madison County N010719001
near Greenville

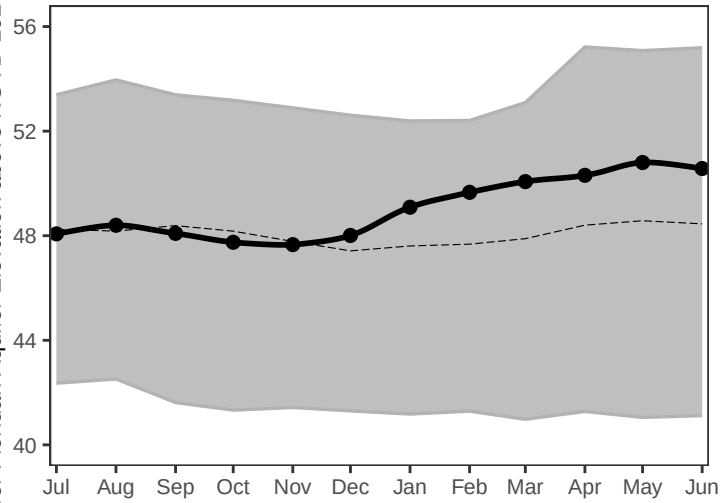


Suwannee County S021335001
near Live Oak

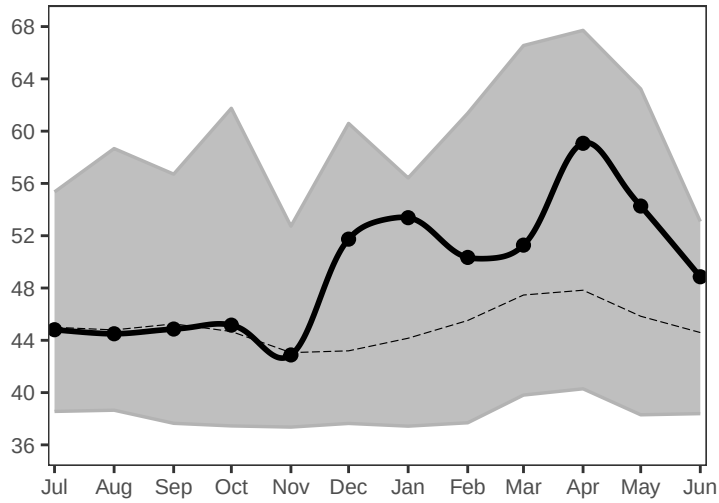


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

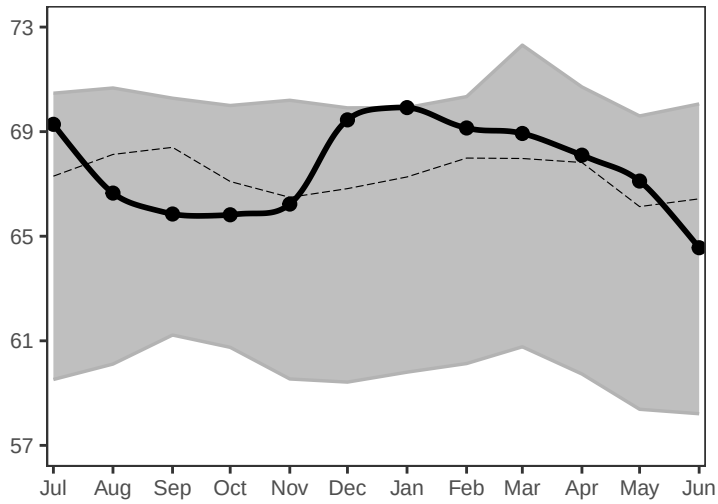
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S040736005
Perry

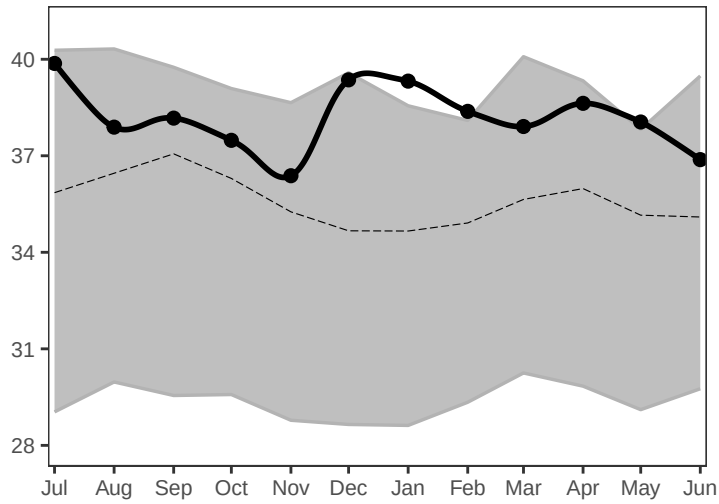
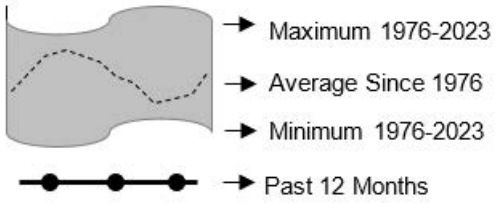
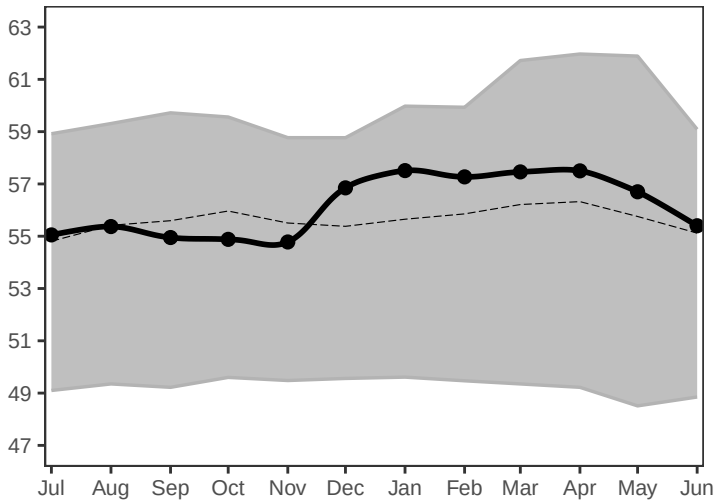


Figure 11, cont.: Monthly Groundwater Statistics

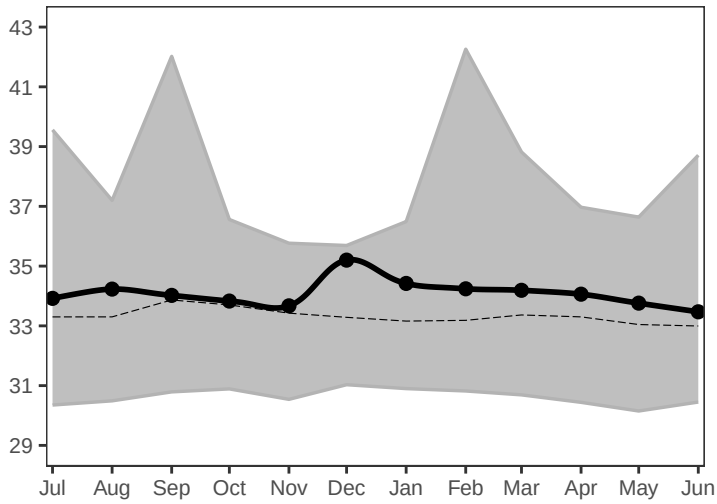
Levels July 2023 through June 2024
Period of Record Beginning 1976



Union County S051933001
near Lake Butler

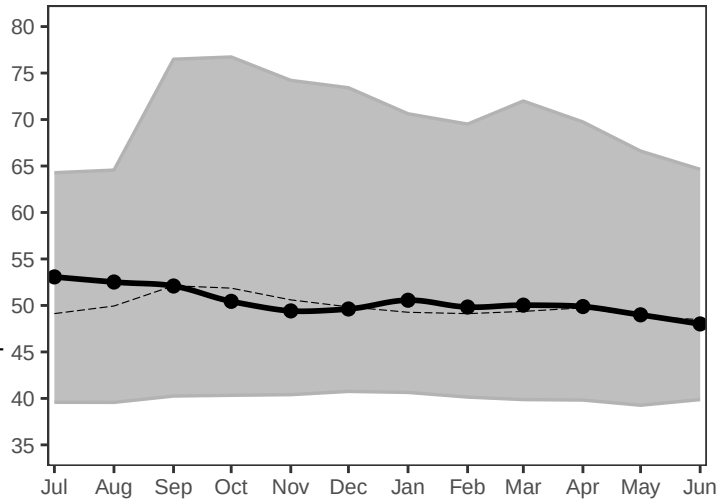


Alachua County S081703001
at High Springs

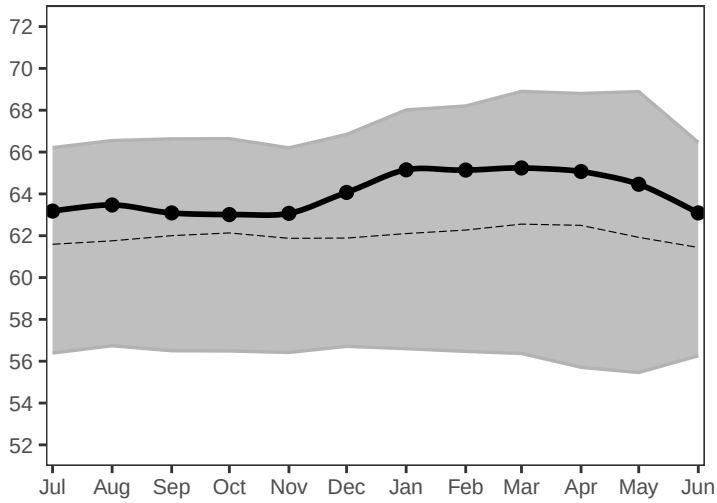


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

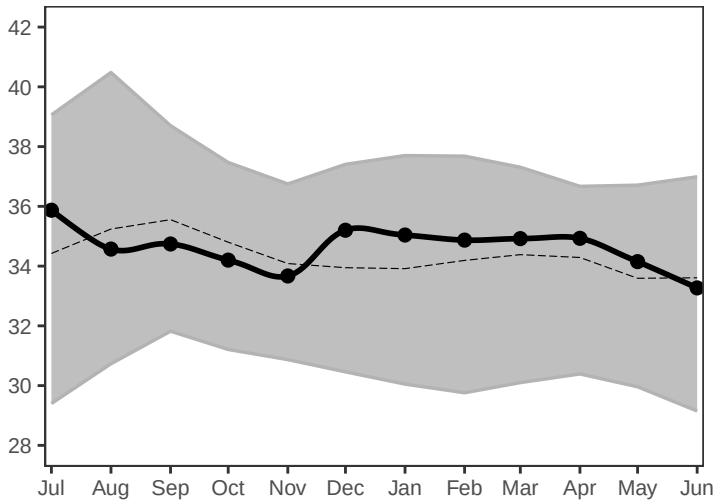
Gilchrist County S091607001
near Trenton



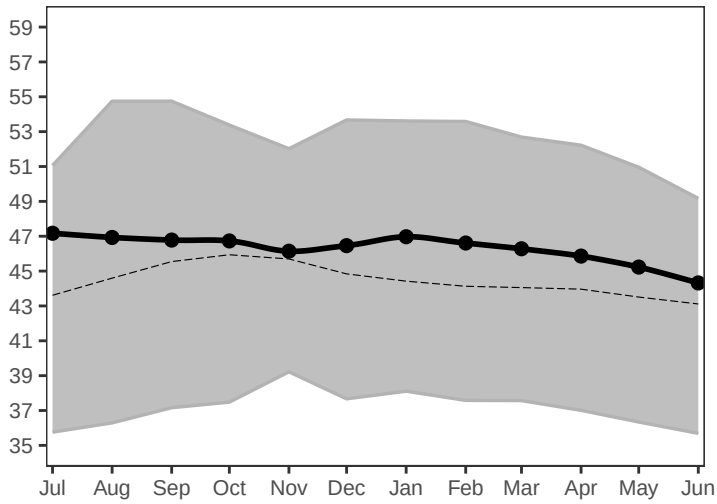
Bradford County S072132001
near Graham



Dixie County S101210001
at Cross City



Levy County S131736001
near Bronson



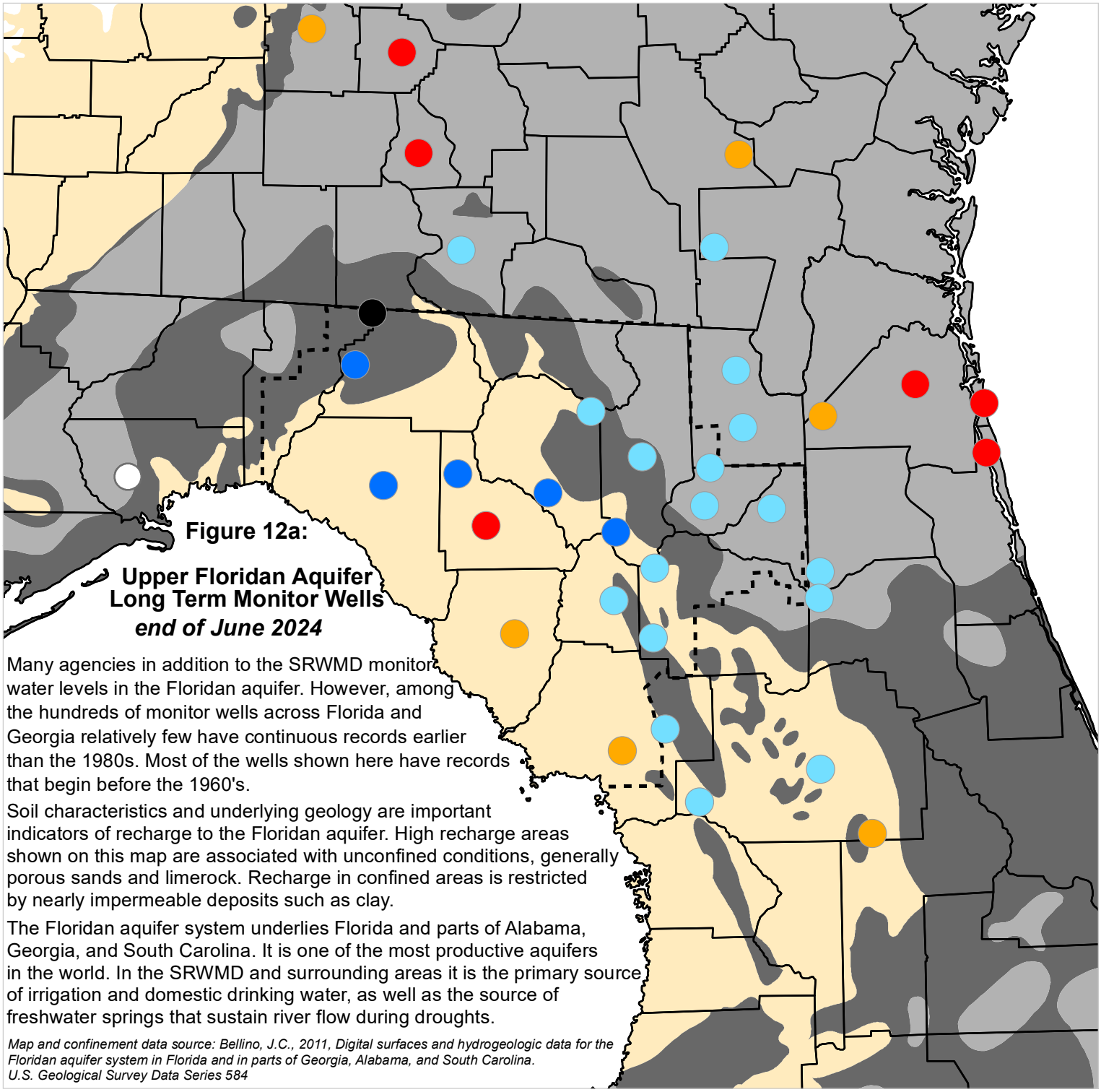


Figure 12a:

Upper Floridan Aquifer Long Term Monitor Wells

end of June 2024

Many agencies in addition to the SRWMD monitor water levels in the Floridan aquifer. However, among the hundreds of monitor wells across Florida and Georgia relatively few have continuous records earlier than the 1980s. Most of the wells shown here have records that begin before the 1960's.

Soil characteristics and underlying geology are important indicators of recharge to the Floridan aquifer. High recharge areas shown on this map are associated with unconfined conditions, generally porous sands and limerock. Recharge in confined areas is restricted by nearly impermeable deposits such as clay.

The Floridan aquifer system underlies Florida and parts of Alabama, Georgia, and South Carolina. It is one of the most productive aquifers in the world. In the SRWMD and surrounding areas it is the primary source of irrigation and domestic drinking water, as well as the source of freshwater springs that sustain river flow during droughts.

Map and confinement data source: Bellino, J.C., 2011, Digital surfaces and hydrogeologic data for the Floridan aquifer system in Florida and in parts of Georgia, Alabama, and South Carolina. U.S. Geological Survey Data Series 584

Occurrence of Confined and Unconfined Conditions in the Upper Floridan Aquifer

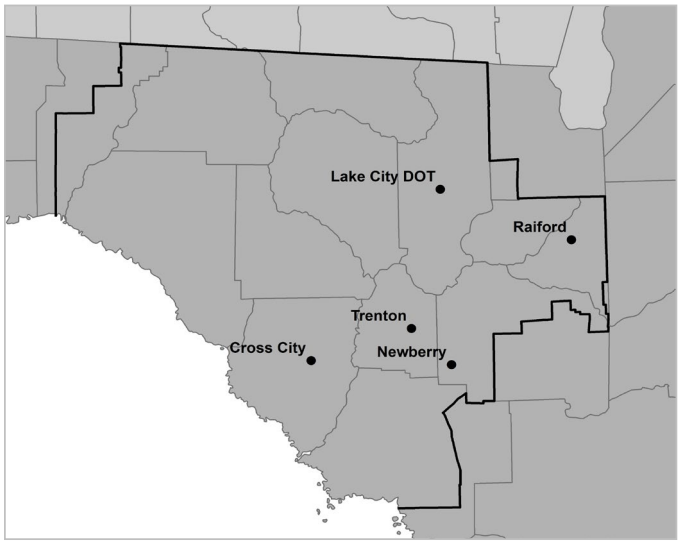
- Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
- Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
- Unconfined: Upper confining unit is absent or very thin. Recharge is high.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

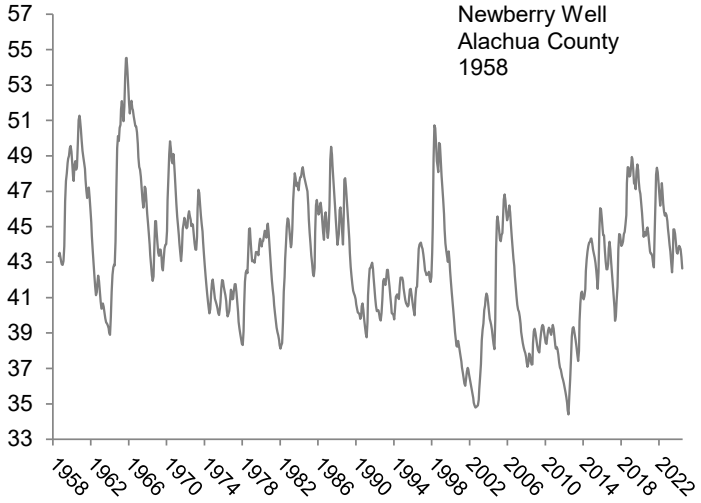
Percentile of Most Recent Water Level Relative to Entire Record

- 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 2024





Upper Floridan Aquifer Elevation above NGVD 1929, Feet