SUWANNEE RIVER WATER MANAGEMENT DISTRICT

MEMORANDUM

TO: Governing Board

FROM: Robbie McKinney, Hydrologist IV, Office of Water Resources

THRU: Hugh Thomas, Executive Director

DATE: April 30, 2022

RE: April 2022 Hydrologic Conditions Report

RAINFALL

- Districtwide average rainfall for the month was 1.83", which was 46% less than the 1932-2021 average of 3.41" (Table 1, Figure 1). The 12-month period ending April 30 reflected a Districtwide rainfall surplus of 6.53", which was lower than the 9.28" surplus at the end of March. Most District counties received between 1" and 2" of rainfall on average with portions of Levy, Baker, Jefferson, Hamilton, Columbia, and Suwannee counties receiving more than 4" (Figure 2).

- A 12-month rainfall surplus was present for all basins, with the Coastal Basin showing the highest surplus at 13.2". However, surplus amounts for April were lower for all basins when compared with March (Figure 3). Portions of the Coastal Basin still retained a surplus greater than 24" by the end of April. All river basins exhibited a 3-month rainfall surplus at the end of the month, with the Aucilla and Coastal basins decreasing surplus amounts from March to April (Figure 4). Portions of the Waccasassa Basin still showed a deficit greater than 1" at the conclusion of April.

SURFACE WATER

- **Rivers:** Most river stations shown in Figure 5 finished the month in the normal (25^{th} – 75^{th} percentile) flow range, while the Ichetucknee River ended April in the above normal (75^{th} – 90^{th} percentile) category. The Ichetucknee River also set new record high flows for a majority of the month. Many river gages in North Florida and South Georgia were in either the normal or above normal (75^{th} – 90^{th} percentile) flow categories at the end of the month (Figure 6). However, due to a decrease in rainfall throughout April, two rivers in Georgia (Ochlocknee near Thomasville and Little River near Adel) ended the month in the below normal (10^{th} – 25^{th} percentile) flow range.

- **Lakes**: Water levels decreased at all of the monitored lakes in the District this month (Figure 7). The average decrease in stage across all measured lakes was around 0.7'. Palestine, Butler, Crosby, and Sampson lakes all ended April below their respective long-term averages. Cherry Lake was very close to but just slightly above its long-term average at the end of the month.

- **Springs**: Flow measurements were made during April at 13 springs by the U.S. Geological Survey (USGS), District staff, and contractors. The Wacissa River entered April in the normal flow range, moved into the above normal range, and decreased in flow back into the normal category by month's end (Figure 8). Manatee Springs began the month in the below normal category but increased in flow into the normal range, where it remained throughout the rest of the month (Figure 9).

GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District were in either the normal (25th – 75th percentile), high (75th – 90th percentile), or extremely high (> 90th percentile) ranges at the end of April (Figure 10). The eastern portion of the District showed the majority of the extremely high aquifer levels by month's end. Overall, groundwater levels decreased by a median of 0.1' since the end of March and ended April with a Districtwide average around the 81st percentile.

Most county index wells remained higher than historic monthly average levels at the end of April except for Lafayette County near Mayo (Figure 11). The long-term District UFA well levels ended the month either within normal, high, or very high (> 90th percentile) ranges (Figure 12a). Overall, water levels at long-term wells with records that extend back to at least 1964 mostly increased this month (Figure 12b).

CLIMATE AND DROUGHT OUTLOOK

The Climate Prediction Center forecasts a continuation of La Niña conditions through the summer (59% chance from June to August) with a 50-55% chance of continuation through the fall.

The NOAA three-month seasonal outlook favors above normal temperatures along with above normal rainfall chances throughout much of the District from May through July. The U.S. Drought Monitor report released on May 5, 2022, showed all or part of most District counties with abnormally dry (D0) 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 13, 2022, to November 6, 2022) 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.

ACKNOWLEDGEMENTS

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

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

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 2022	April Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal
Alachua	2.11	3.12	68%	61.39	117%
Baker	2.58	3.37	76%	58.27	110%
Bradford	1.74	2.94	59%	58.37	113%
Columbia	1.92	3.45	56%	59.22	112%
Dixie	1.44	3.37	43%	71.00	122%
Gilchrist	2.01	3.29	61%	60.90	112%
Hamilton	2.57	3.67	70%	56.86	110%
Jefferson	2.44	4.05	60%	53.24	95%
Lafayette	1.38	3.53	39%	66.02	120%
Levy	2.64	3.06	86%	61.26	109%
Madison	2.11	3.83	55%	57.52	108%
Suwannee	2.00	3.65	55%	56.62	107%
Taylor	1.23	3.61	34%	65.64	116%
Union	1.00	3.22	31%	55.48	105%

*Based on PRISM LT81 rainfall averages by county (1927-2020)

April 2022 District Average	1.83
April Long-Term Average (1932-2021)	3.41
Historical 12-month Average (1932-2021)	54.73
Past 12-Month Total	61.26
12-Month Rainfall **Surplus**/Deficit	**6.53**

Figure 1: Comparison of District-wide Monthly Rainfall

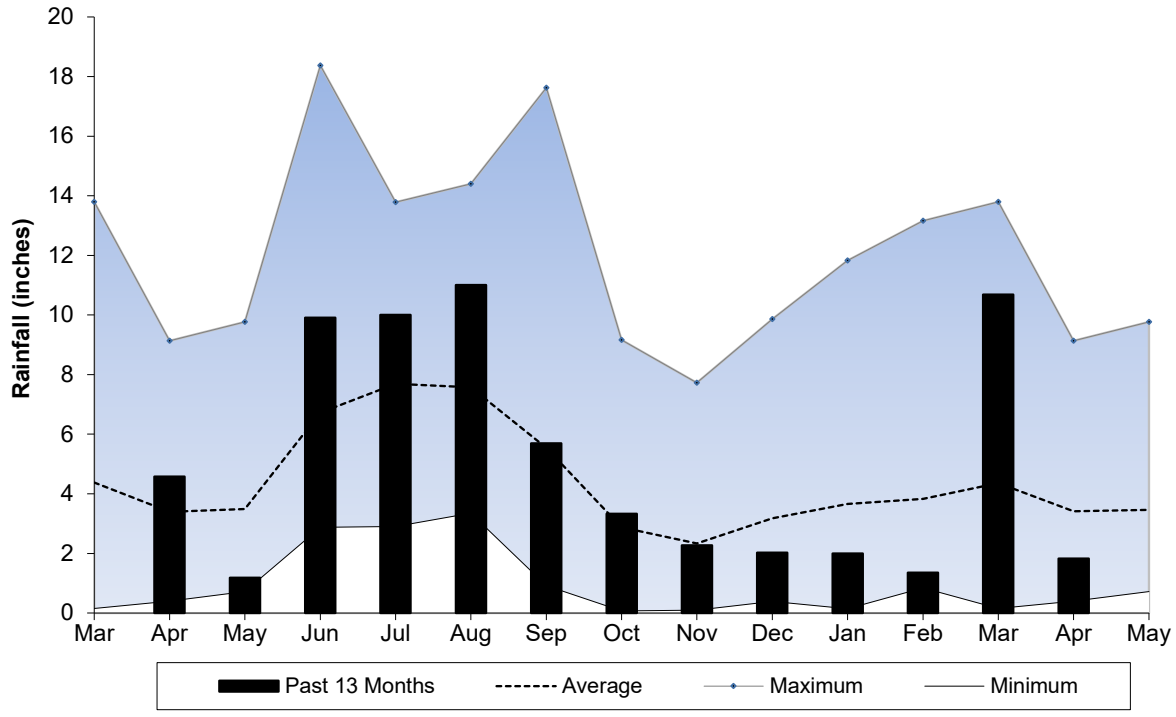


Figure 2: April 2022 SRWMD Gage-adjusted Radar Rainfall

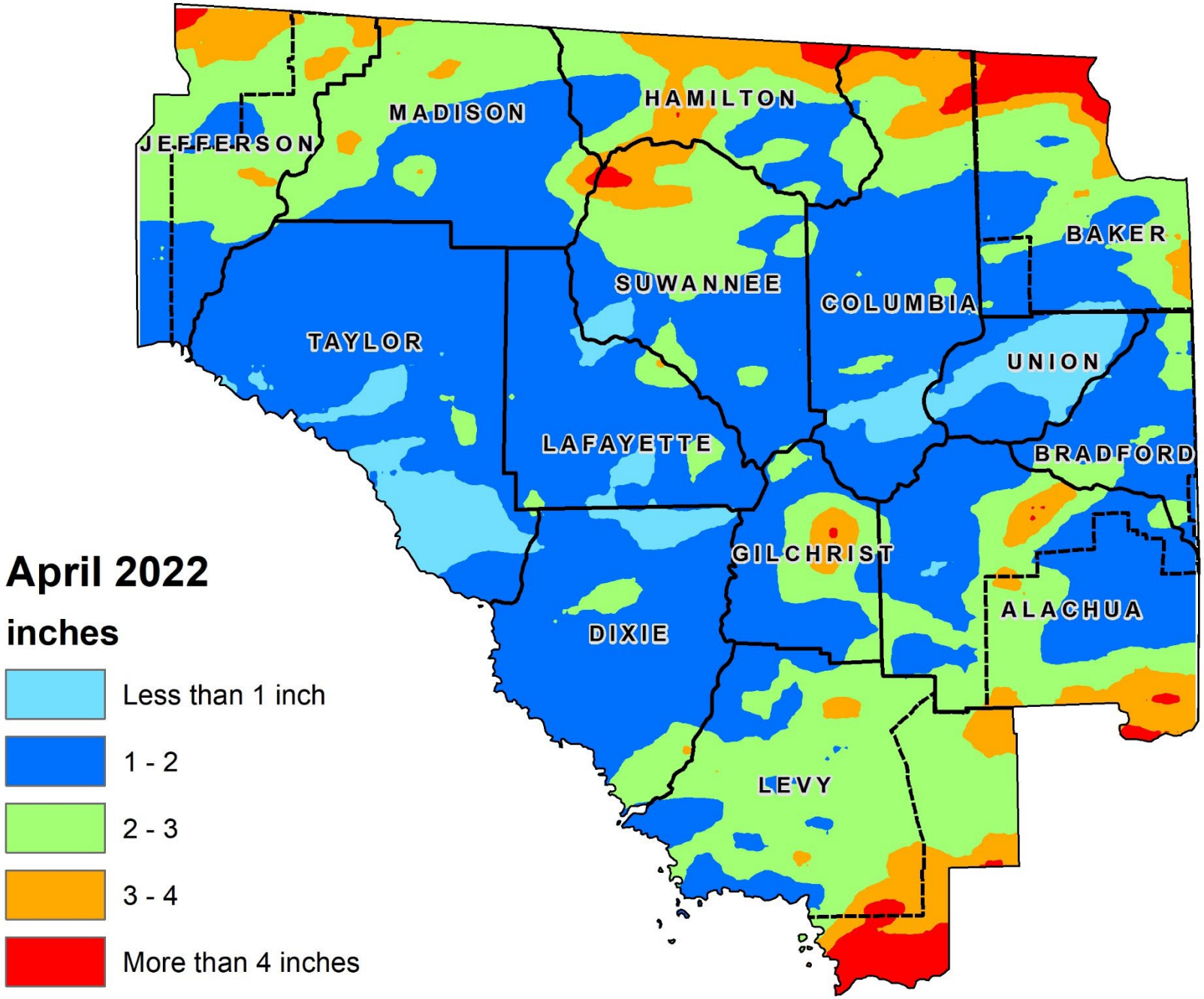


Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through April 30, 2022

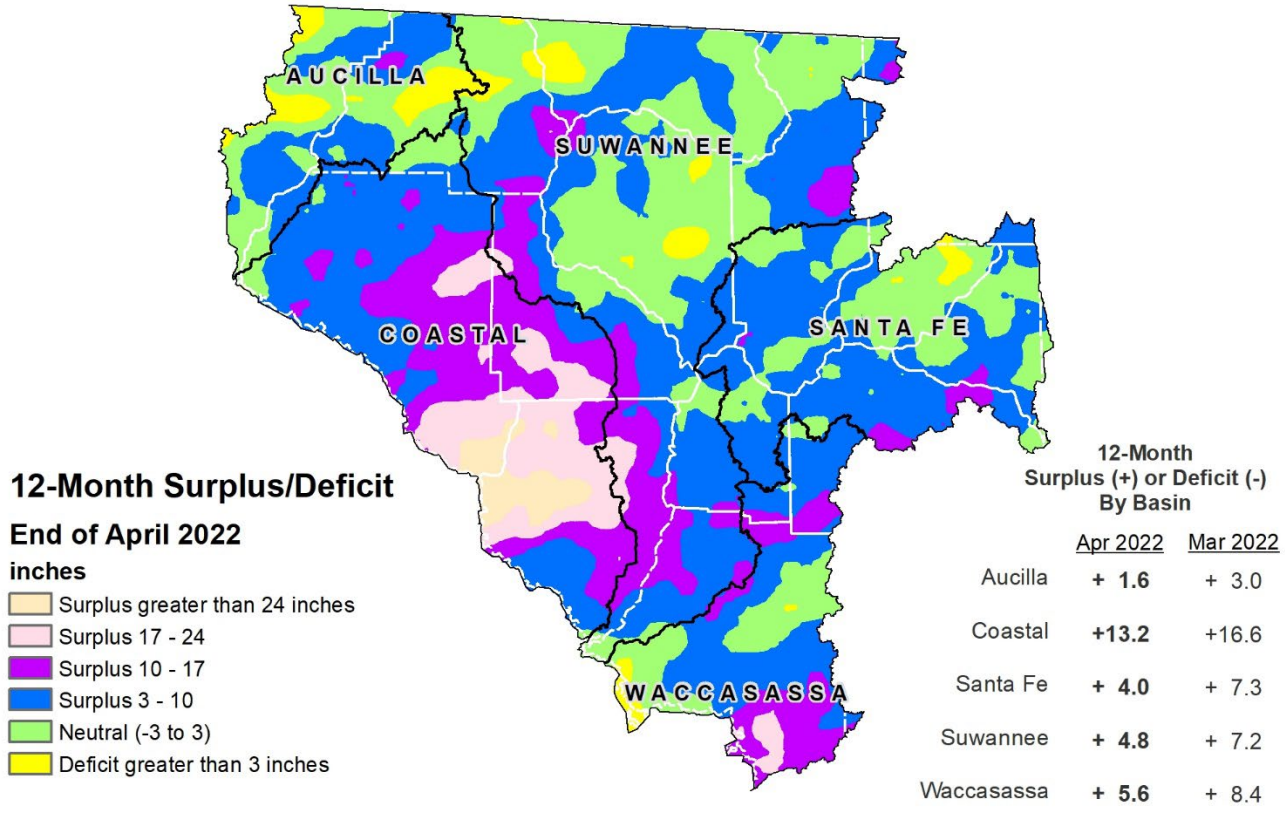


Figure 4: 3 - Month Rainfall Surplus/Deficit by River Basin through April 30, 2022

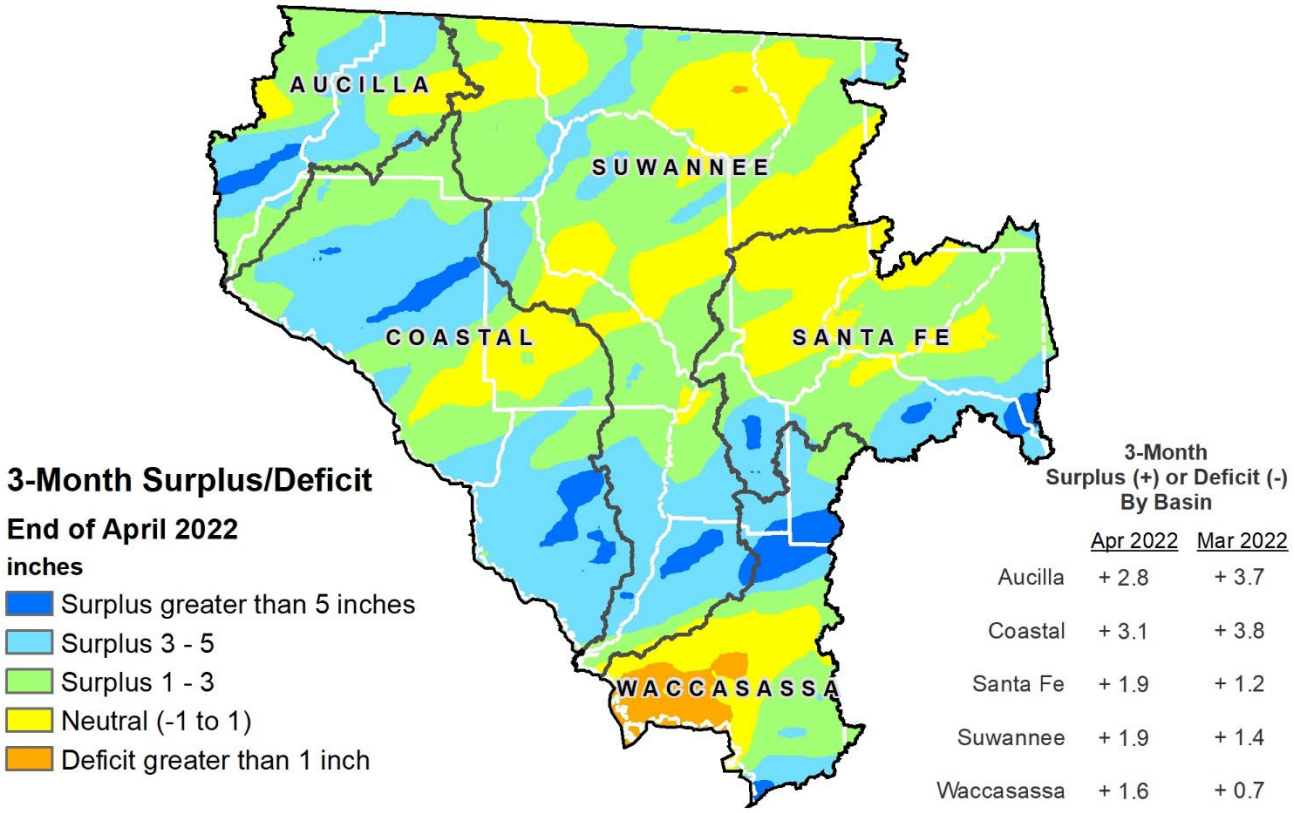
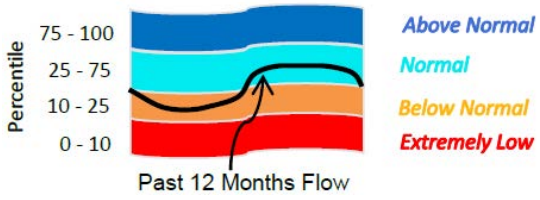
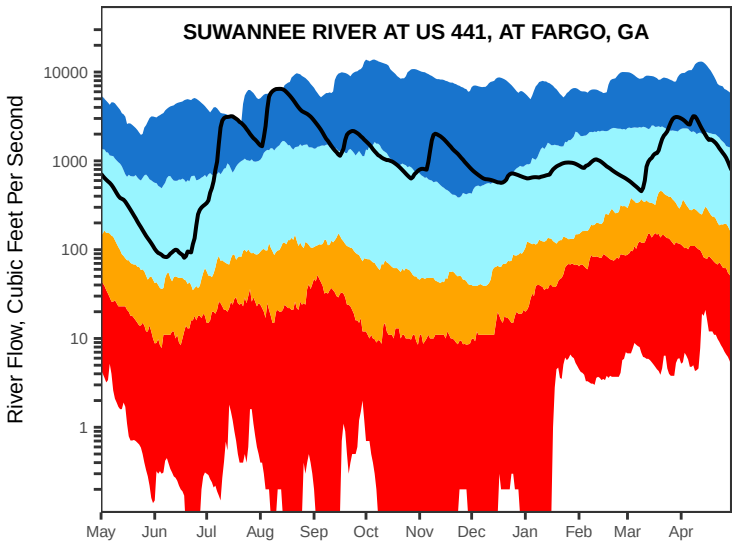
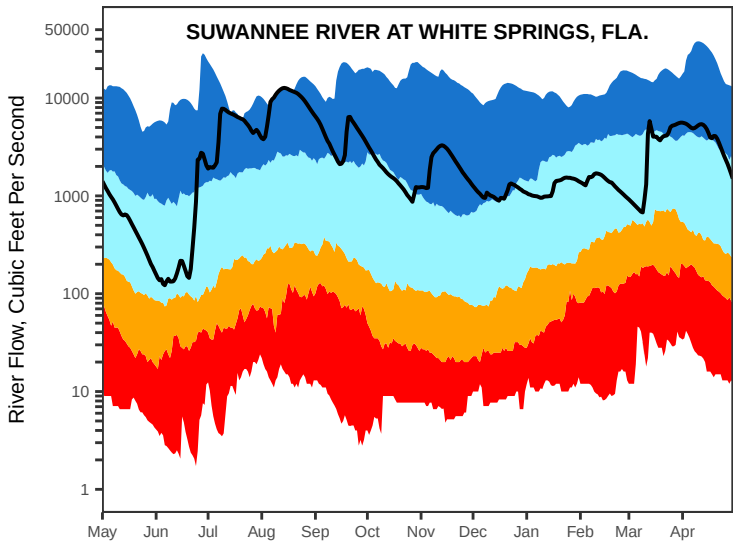


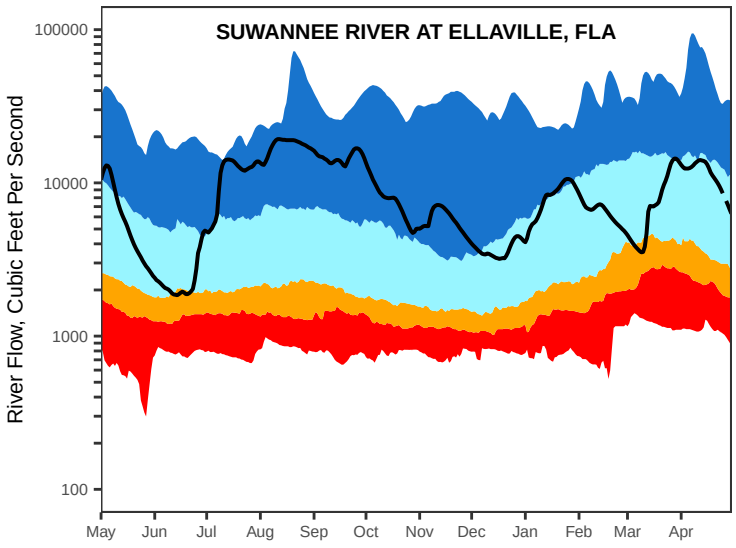
Figure 5: Daily River Flow Statistics

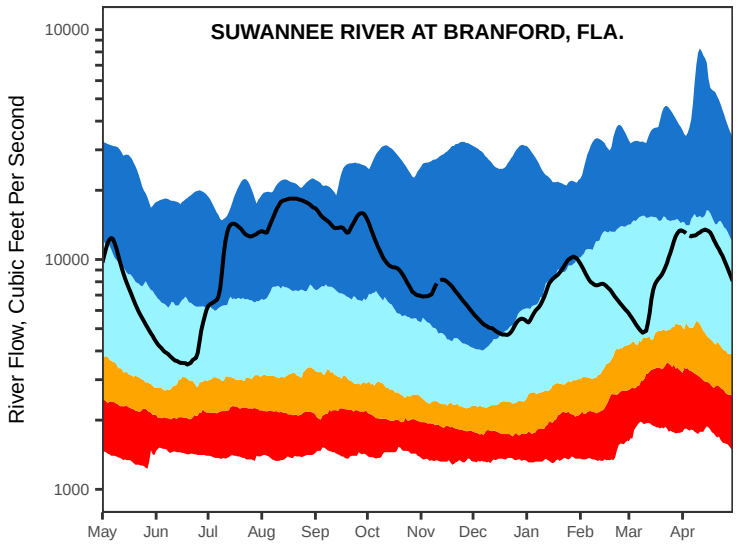
May 1, 2021 through April 30, 2022

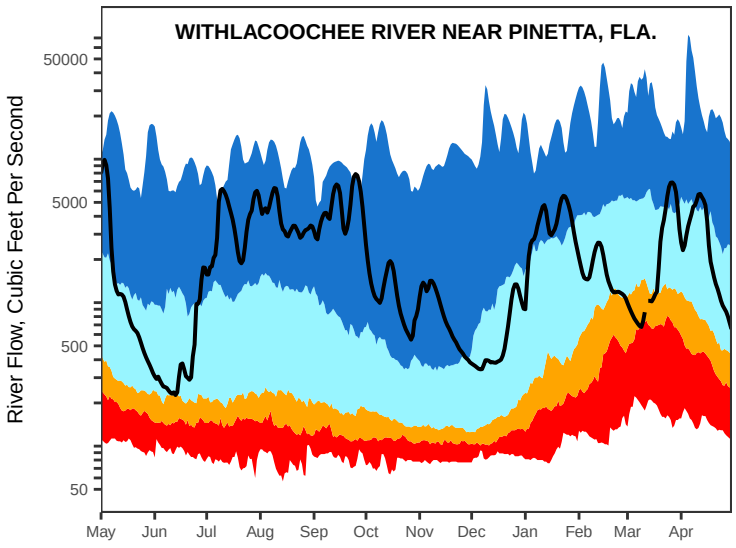












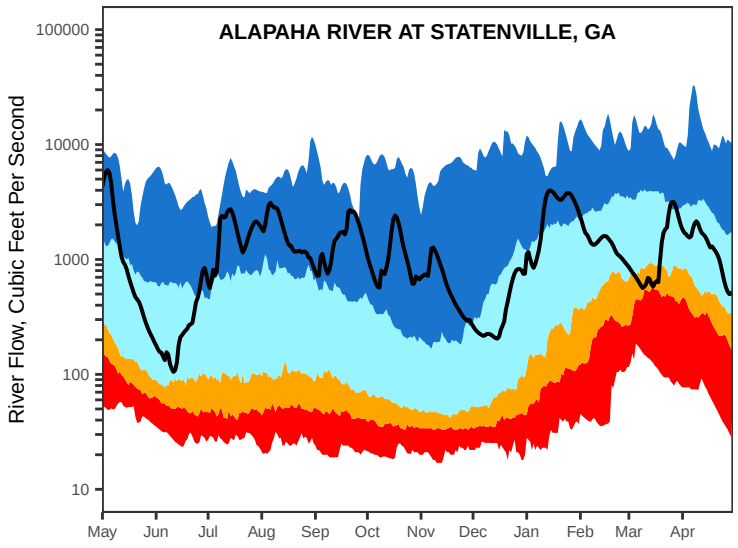
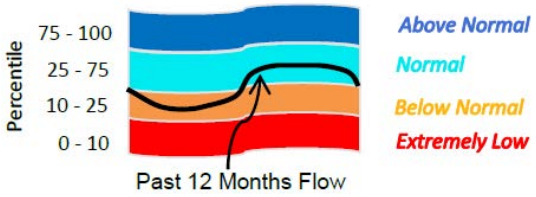
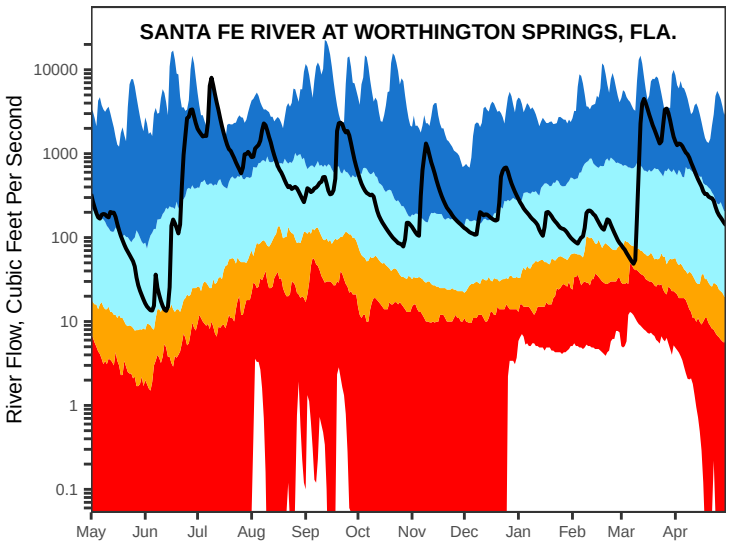
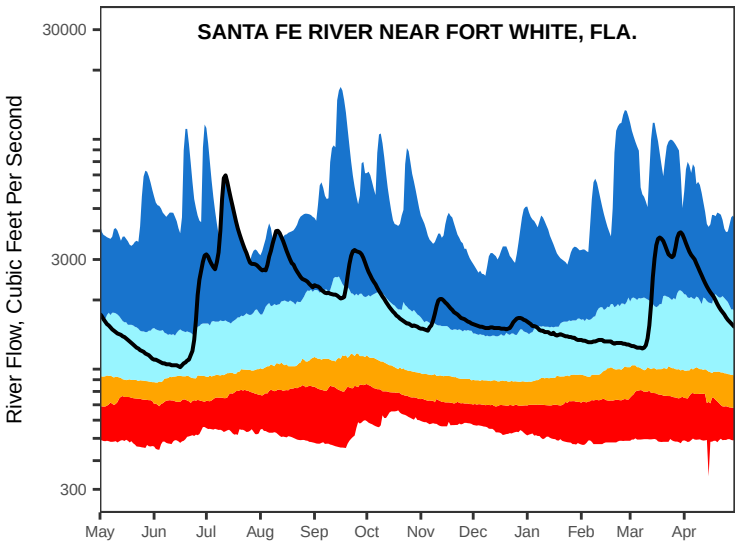


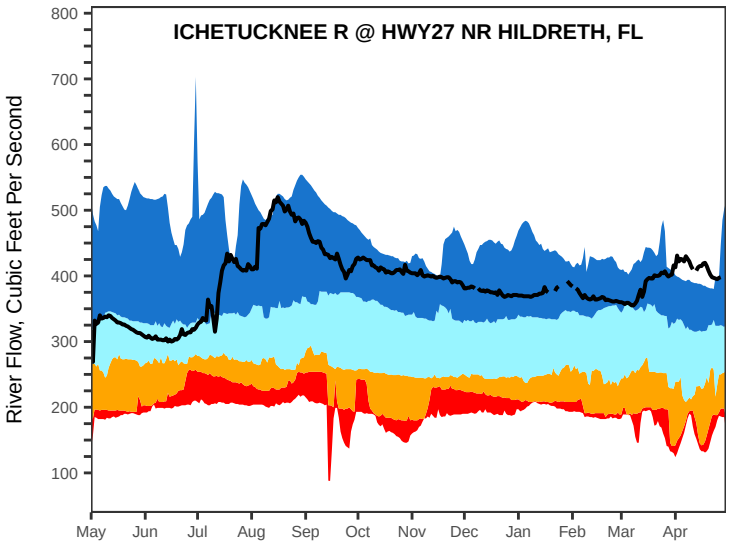
Figure 5, cont.: Daily River Flow Statistics

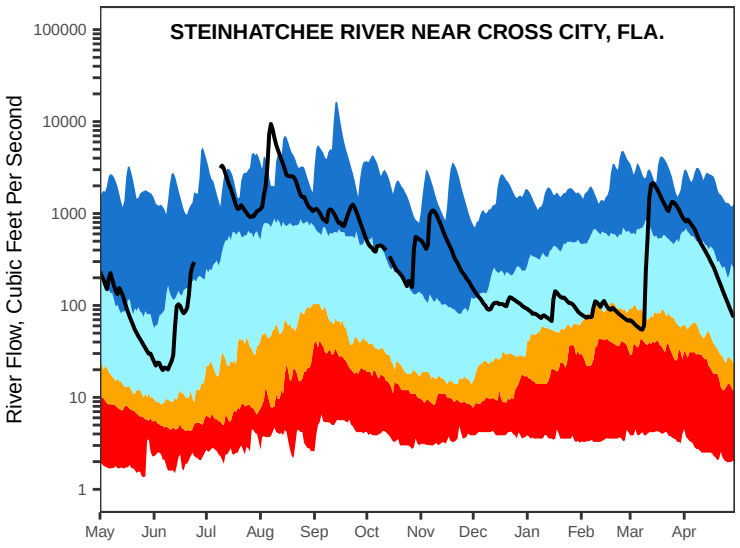
May 1, 2021 through April 30, 2022

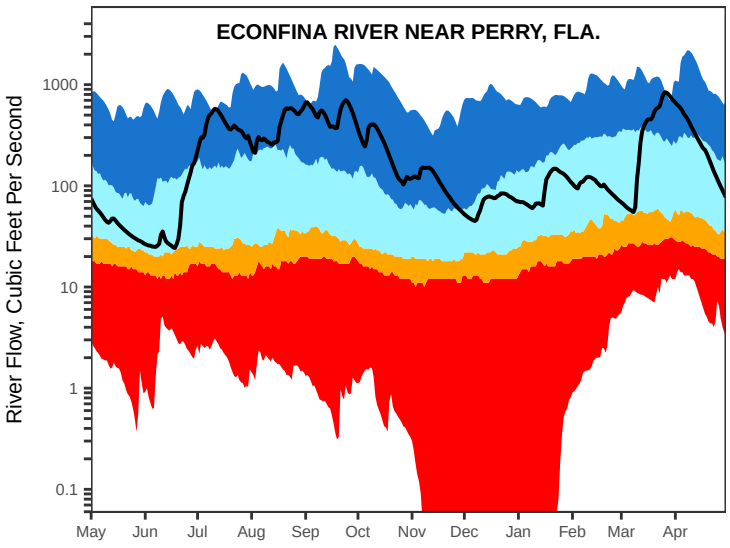


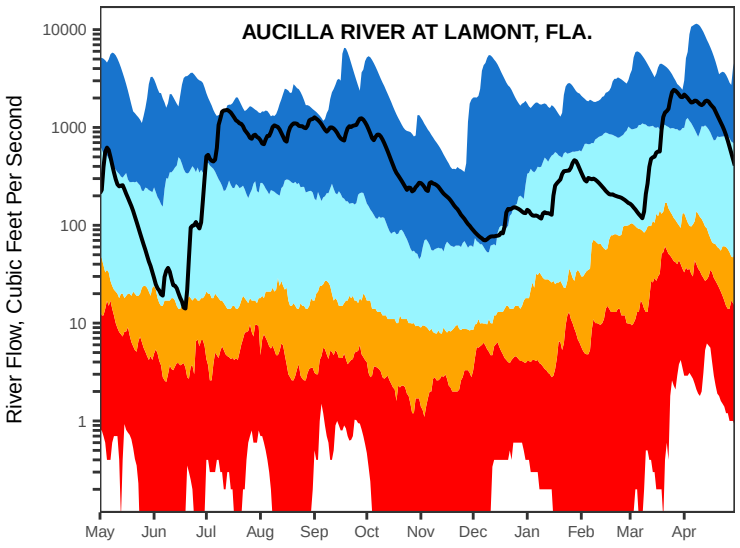












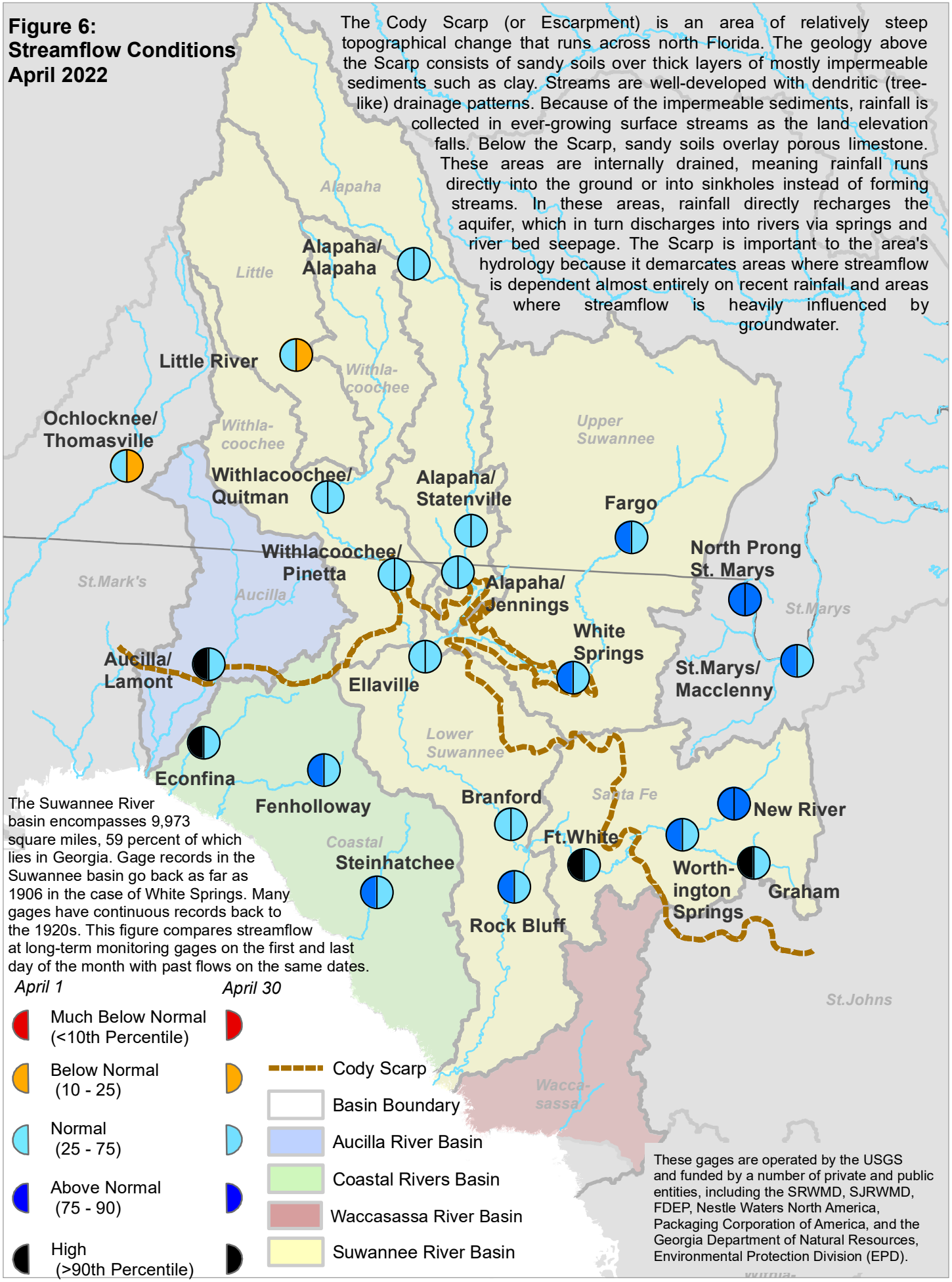
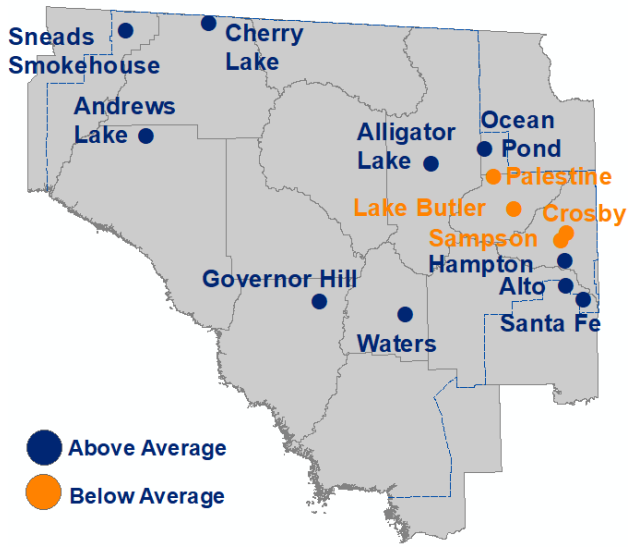


Figure 6:
Streamflow Conditions
April 2022
The Cody Scarp (or Escarpment) is an area of relatively steep topographical change that runs across north Florida. The geology above the Scarp consists of sandy soils over thick layers of mostly impermeable sediments such as clay. Streams are well-developed 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.
Alapaha
Alapaha/
Alapaha
Little
Little River
Withla-
coochee
Ochlocknee/
Thomasville
Withla-
coochee
Upper
Suwannee
Withlacoochee/
Quitman
Alapaha/
Statenville
Fargo
Withlacoochee/
Pinetta
Alapaha/
Jennings
North Prong
St. Marys
St.Mark's
Aucilla
St.Marys
White
Springs
Aucilla/
Lamont
Ellaville
St.Marys/
Macclenny
Lower
Suwannee
Econfina
Fenholloway
Branford
Santa Fe
New River
Ft.White
Coastal
Steinhatchee
Worth-
ington
Springs
Graham
Rock Bluff
St.Johns
Wacca-
sassa
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
Much Below Normal (<10th Percentile)
Below Normal (10 - 25)
Normal (25 - 75)
Above Normal (75 - 90)
High (>90th Percentile)
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 2022 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.

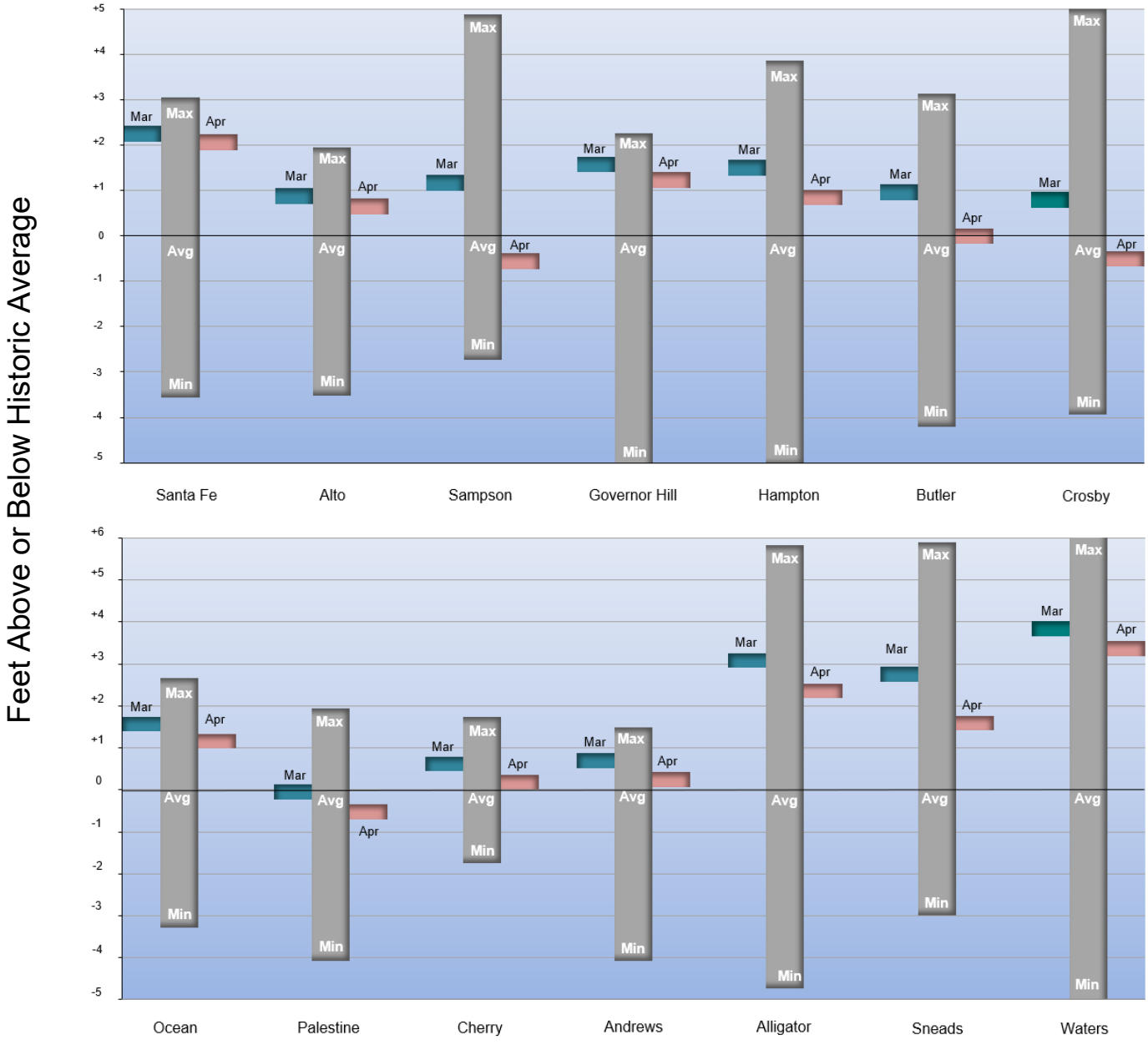


Figure 8: Flow Over the Past 12 Months, Wacissa River (cubic feet per second)

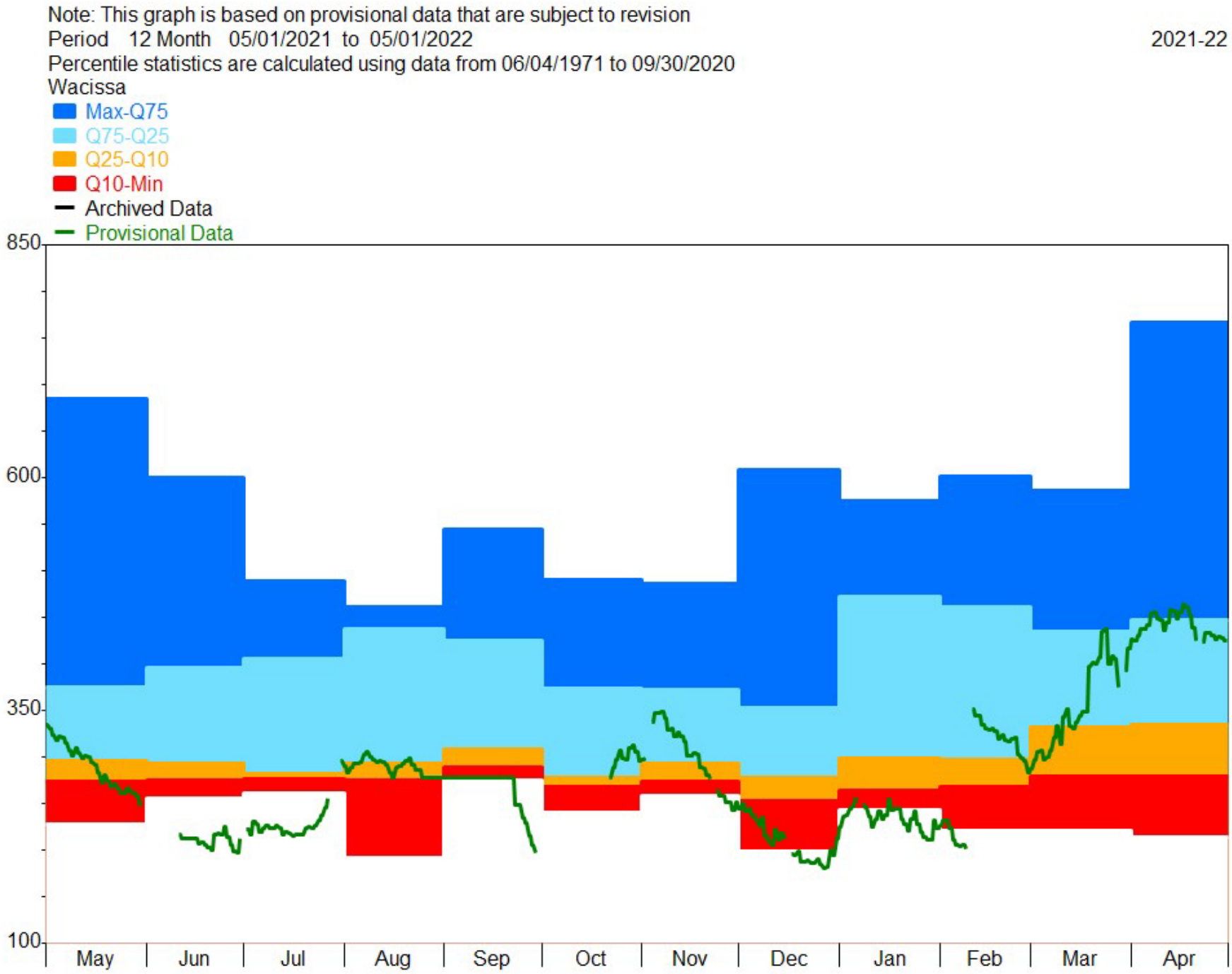
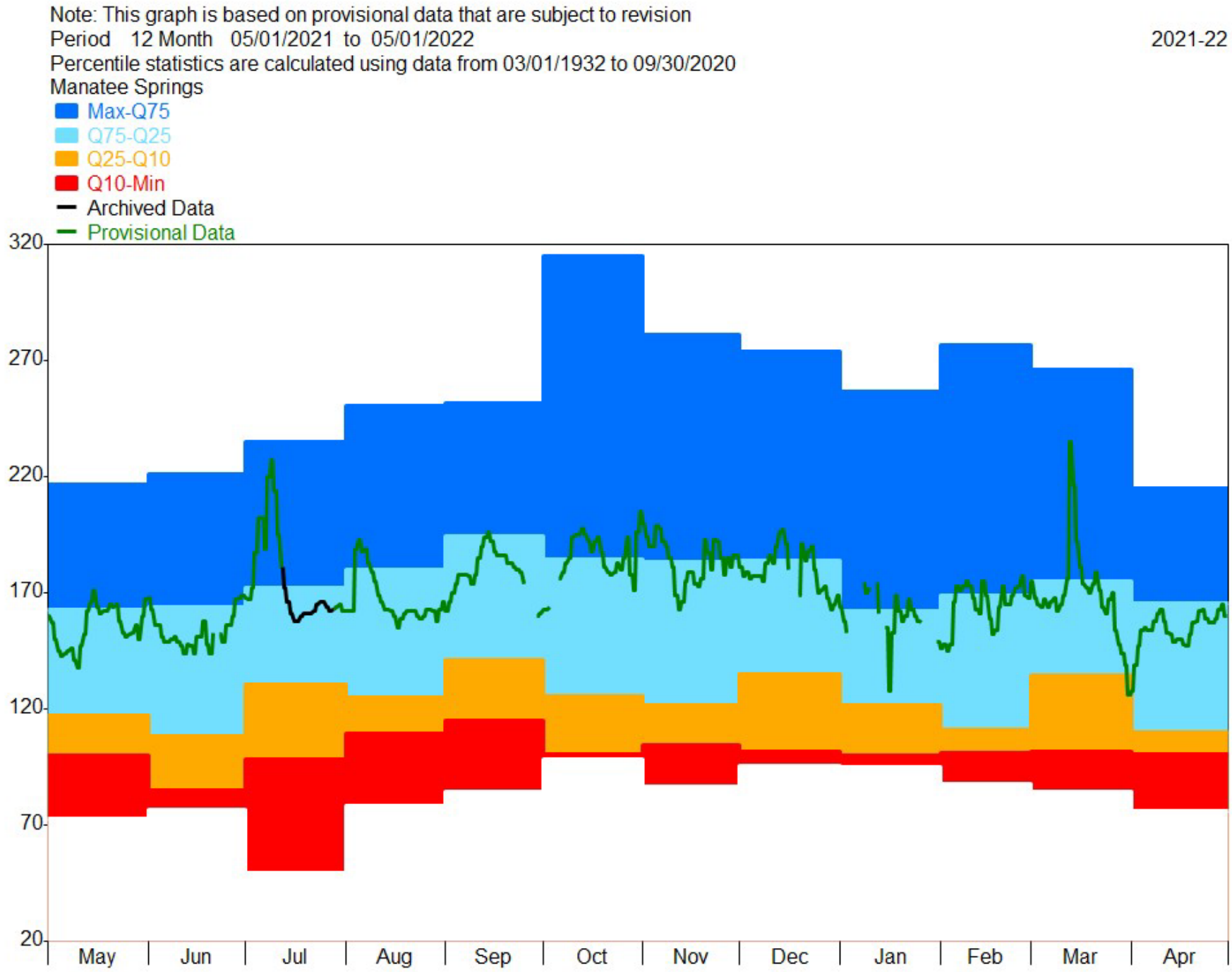


Figure 9: Flow Over the Past 12 Months, Manatee Springs (cubic feet per second)



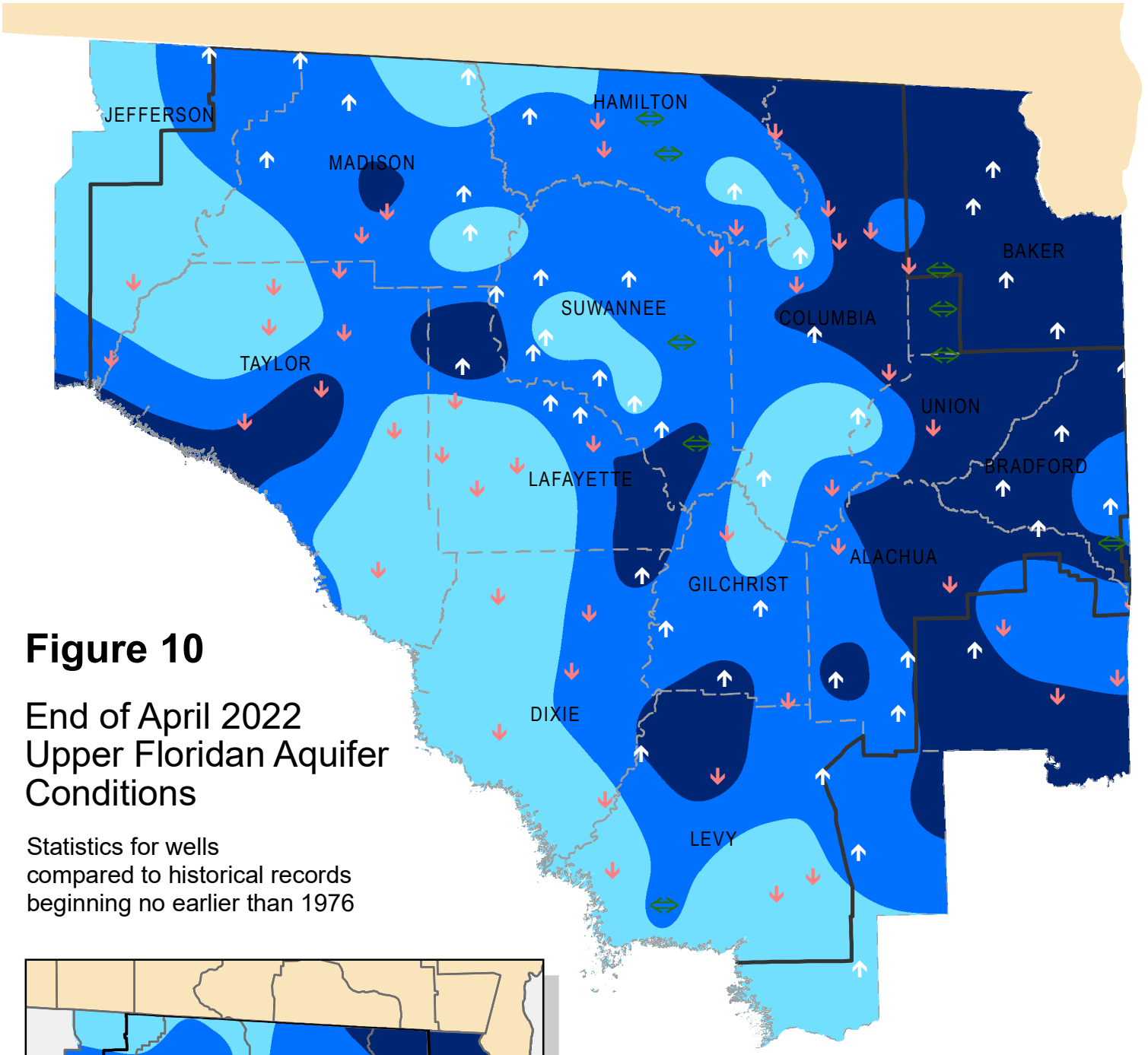
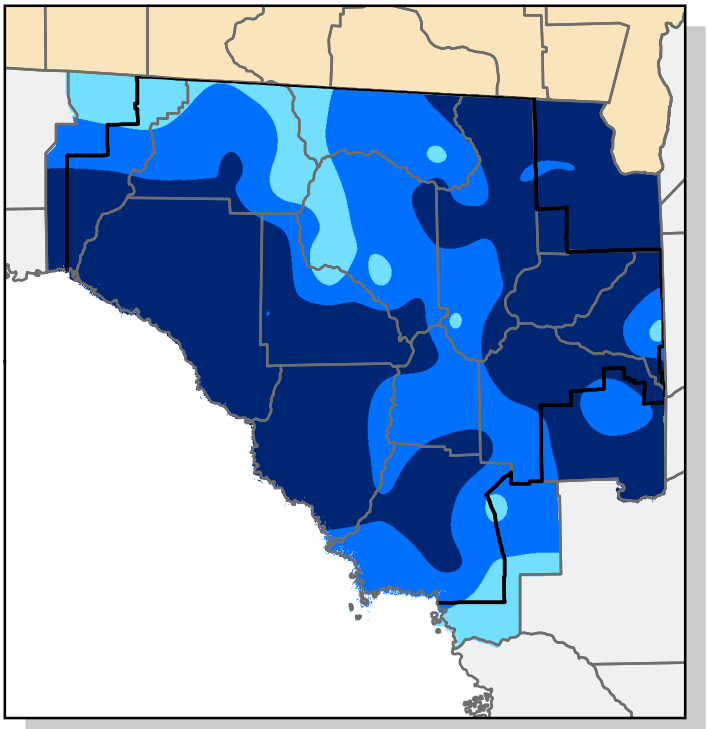


Figure 10

End of April 2022 Upper Floridan Aquifer Conditions

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

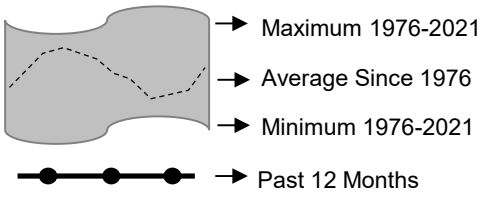


Inset: March Groundwater Percentiles

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 Level Statistics
Levels May 2021 through April 2022
Period of Record Beginning 1976



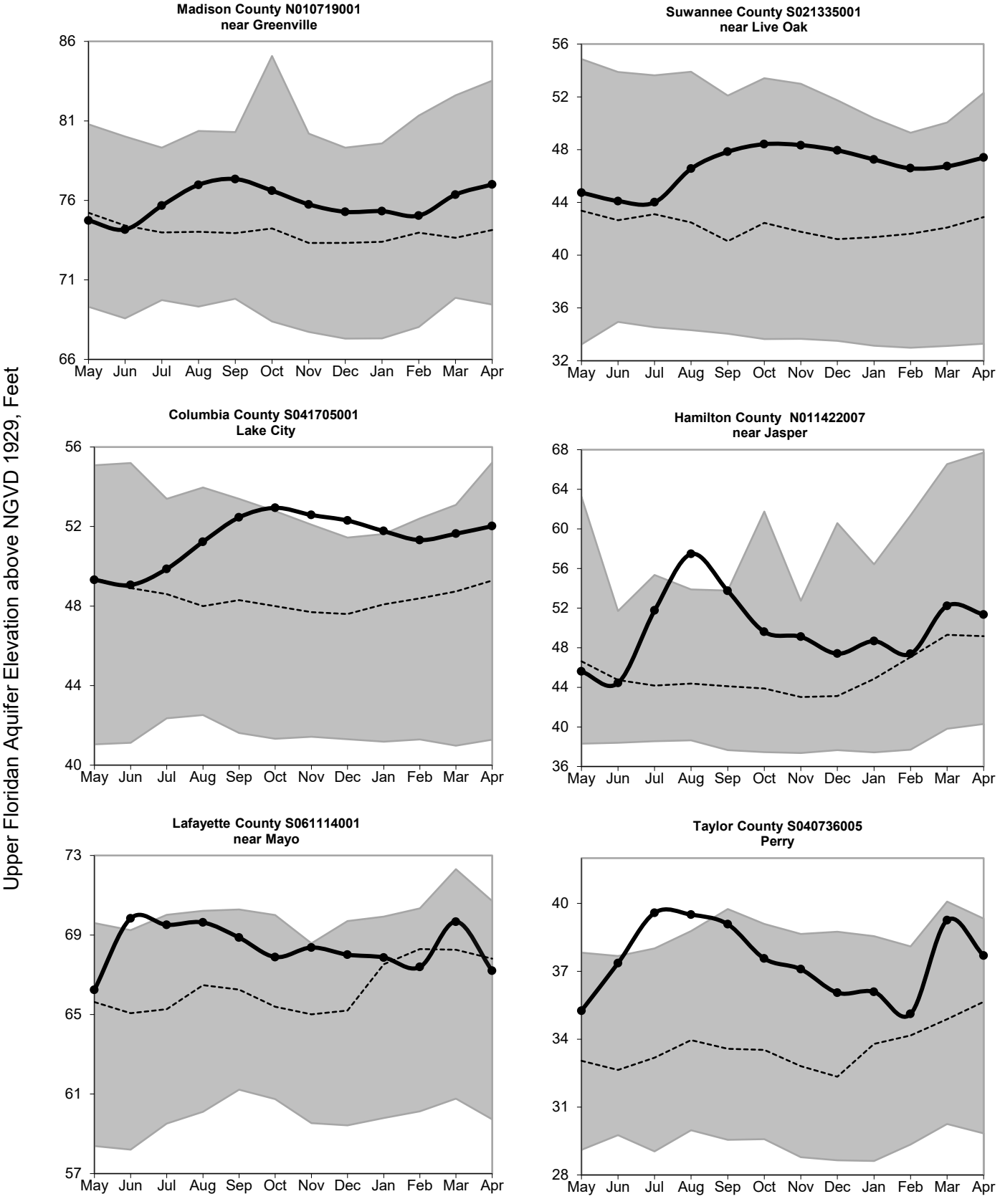
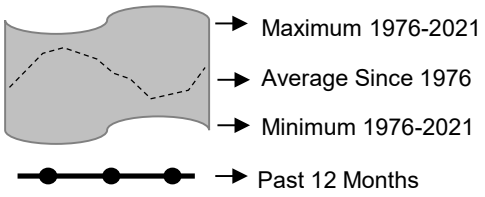
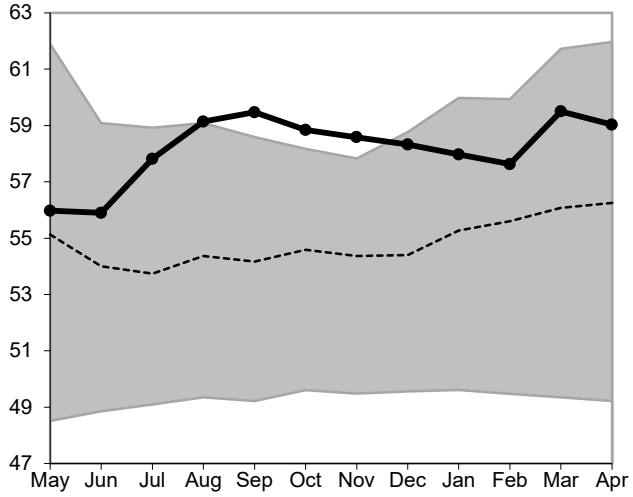


Figure 11, cont.: Groundwater Level Statistics
Levels May 2021 through April 2022
Period of Record Beginning 1976

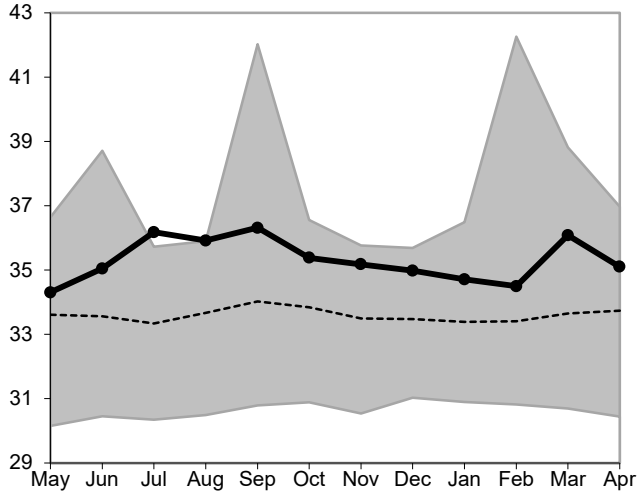


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

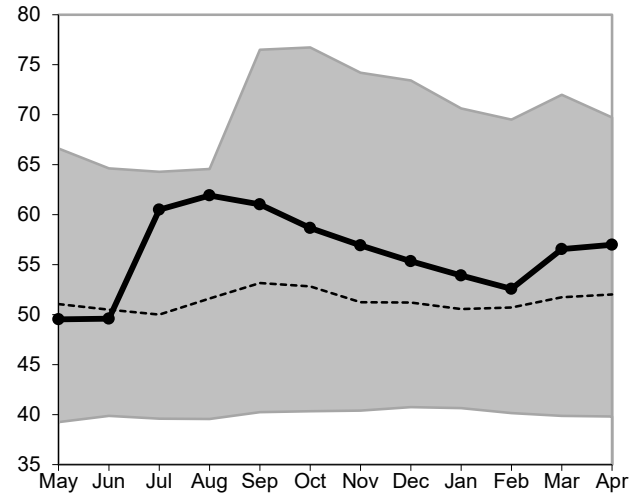
Union County S051933001
near Lake Butler



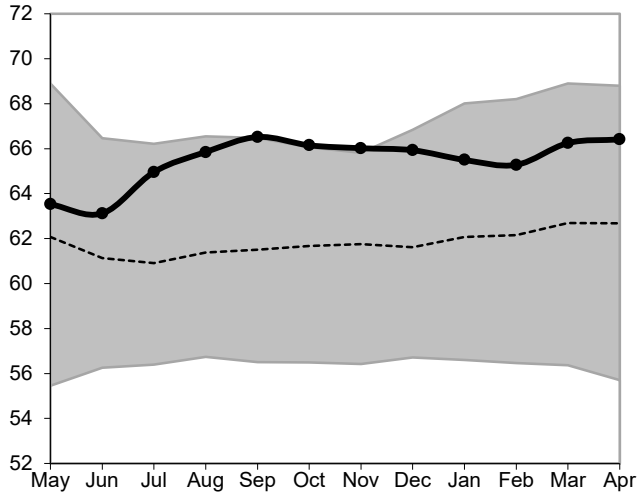
Alachua County S081703001
at High Springs



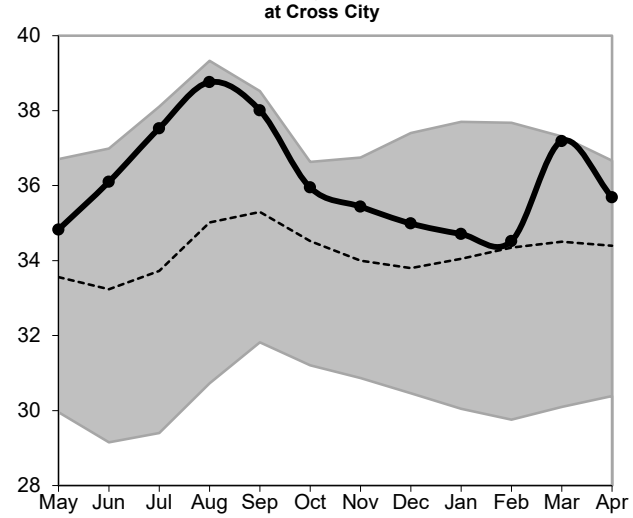
Gilchrist County S091607001
near Trenton



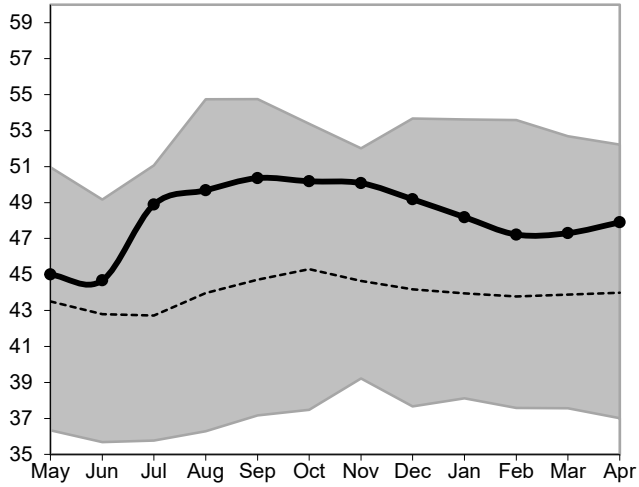
Bradford County S072132001
near Graham



Dixie County S101210001
at Cross City



Levy County S131736001
near Bronson



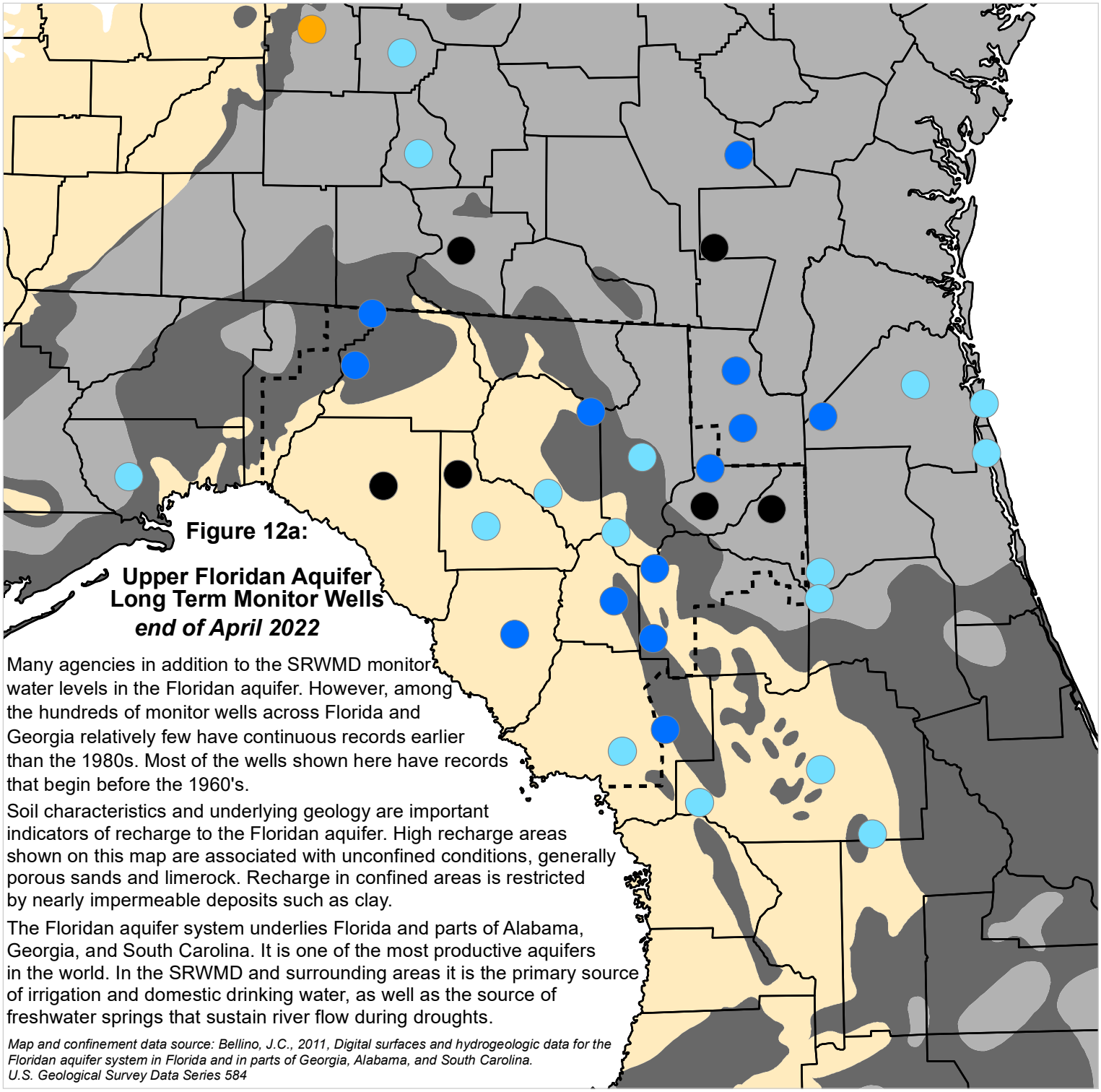


Figure 12a:

Upper Floridan Aquifer Long Term Monitor Wells

end of April 2022

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

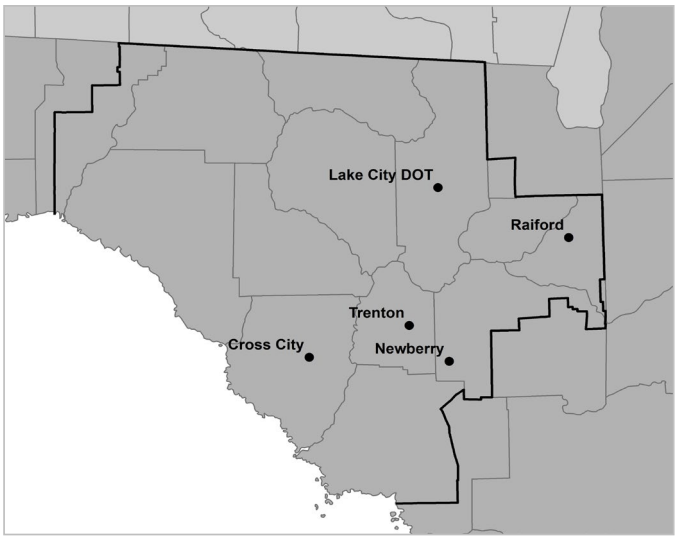
- Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
- Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
- Unconfined: Upper confining unit is absent or very thin. Recharge is high.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

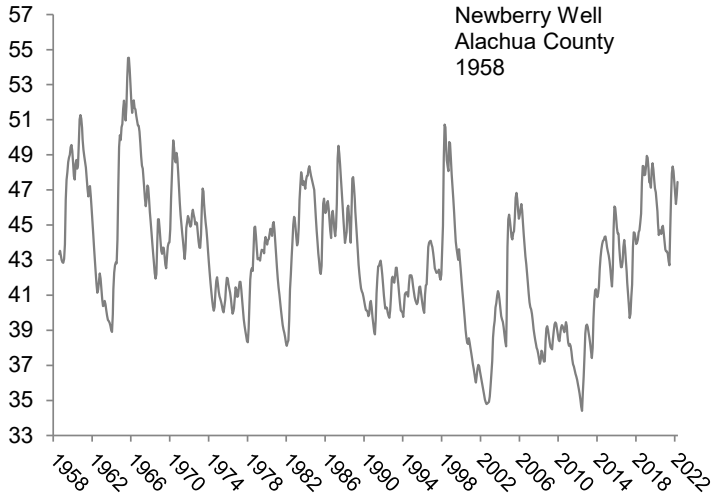
Percentile of Most Recent Water Level Relative to Entire Record

- 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 April 2022





Upper Floridan Aquifer Elevation above NGVD 1929, Feet