

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: October 31, 2022

RE: October 2022 Hydrologic Conditions Report

RAINFALL

- Districtwide average rainfall for the month was 0.41", which was about 86% lower than the 1932-2021 average of 2.88" (Table 1, Figure 1). The 12-month period ending October 31 reflected a Districtwide rainfall deficit of 6.35", which represented an increase in the 3.43" deficit seen at the end of September. Most District counties received anywhere from 0.1" to 1" of rainfall on average with areas of Baker, Union, Bradford, Alachua, Taylor, Madison, and Jefferson counties receiving greater than 1" of rainfall (Figure 2).
- A 12-month rainfall deficit was present for all river basins, with each basin increasing their deficit at the end of October. (Figure 3). However, a small portion of the Waccasassa Basin still showed a surplus greater than 6" by month's end. Regions within the Aucilla, Suwannee, Coastal and Waccasassa basins showed rainfall deficits of greater than 14" at the end of the month. All five of the river basins also exhibited 3-month rainfall deficits, which increased for each basin from September to the end of October (Figure 4). The Waccasassa Basin transitioned from a 3-month rainfall surplus in September to a deficit at the conclusion of October.

SURFACE WATER

- **Rivers:** Many of the river stations shown in Figure 5 finished the month in the normal (25th – 75th percentile) flow range. However, the Steinhatchee River gage showed extremely low flows (<10th percentile) at the end of October, and the Ichetucknee River ended the month in the above normal (75th – 100th percentile) flow range. Most river gages in North Florida and South Georgia also ended October in the normal flow category (Figure 6). Two exceptions include the previously-mentioned below 10th percentile flow of the Steinhatchee River and the Withlacoochee near Quitman, which showed below normal (10th – 25th percentile) flows at the end of the month.
- **Lakes:** Water decreased at all monitored lakes in the District this month (Figure 7). The median decrease in stage across all measured lakes was around 0.6'. Sneads Smokehouse had the highest stage decrease at just over 2'. Eight lakes concluded the month below their respective long-term averages. As a note, Lake Alto is currently offline due to gage damage and is not included in the current report statistics.
- **Springs:** Flow measurements were made during October at 14 springs by the U.S. Geological Survey (USGS), District staff, and contractors. Both Lafayette Blue Spring (Figure 8) and the Wacissa River (Figure 9) remained in the normal flow range throughout the entire month of October.

GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District ranged anywhere from extremely high (>90th percentile) in the eastern portion to an extremely low (<10th percentile) area in Lafayette County at the end of October (Figure 10). Elsewhere, much of the District showed normal (25th – 75th percentile) groundwater conditions this month. Overall, groundwater levels decreased by a median of about 1.2' since the end of September and ended October with a Districtwide average around the 57th percentile.

Many of the county index wells remained higher than the historical monthly average levels at the end of October except for wells in Hamilton, Lafayette, Taylor, Gilchrist, and Dixie counties (Figure 11). The long-term District UFA well levels ended the month either within the very low, normal, or high 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 forecasts a continuation of La Niña conditions at 75% from December to February with a 54% chance for El Niño Southern Oscillation neutral conditions from February to April 2023.

The NOAA three-month seasonal outlook favors above normal temperatures along with below normal rainfall chances throughout the District from November through January. The U.S. Drought Monitor report released on November 3, 2022, showed most of the 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 Eastern Standard Time (November 6, 2022, to March 12, 2023) is limited to once 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 the District's year-round conservation measures is available at <http://www.srwm.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 Garcia, Susie Hetrick, Robbie McKinney, and Brandi Sistrunk
- Administrative Support/Document Preparation/IT: Paul Buchanan, Tyler Jordan, Andrew Neel, and Kelly Wooley

This report is compiled in compliance with Chapter 40B-21.211, Florida Administrative Code, using rainfall (gauge-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	October 2022	October Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal
Alachua	0.43	2.87	15%	49.15	94%
Baker	1.18	2.99	40%	49.86	94%
Bradford	0.82	3.02	27%	49.95	96%
Columbia	0.25	2.69	9%	48.57	92%
Dixie	0.22	2.92	7%	48.32	83%
Gilchrist	0.25	2.83	9%	46.94	86%
Hamilton	0.55	2.64	21%	46.67	90%
Jefferson	0.51	2.74	18%	45.84	82%
Lafayette	0.34	2.77	12%	46.54	84%
Levy	0.17	2.82	6%	50.19	89%
Madison	0.66	2.67	25%	48.91	92%
Suwannee	0.22	2.67	8%	46.06	87%
Taylor	0.49	2.81	18%	49.26	87%
Union	0.85	2.88	30%	48.96	93%

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

October 2022 District Average	0.41
October Long-Term Average (1932-2021)	2.88
Historical 12-month Average (1932-2021)	54.73
Past 12-Month Total	48.38
12-Month Rainfall Surplus/Deficit	-6.35

Figure 1: Comparison of District-wide Monthly Rainfall

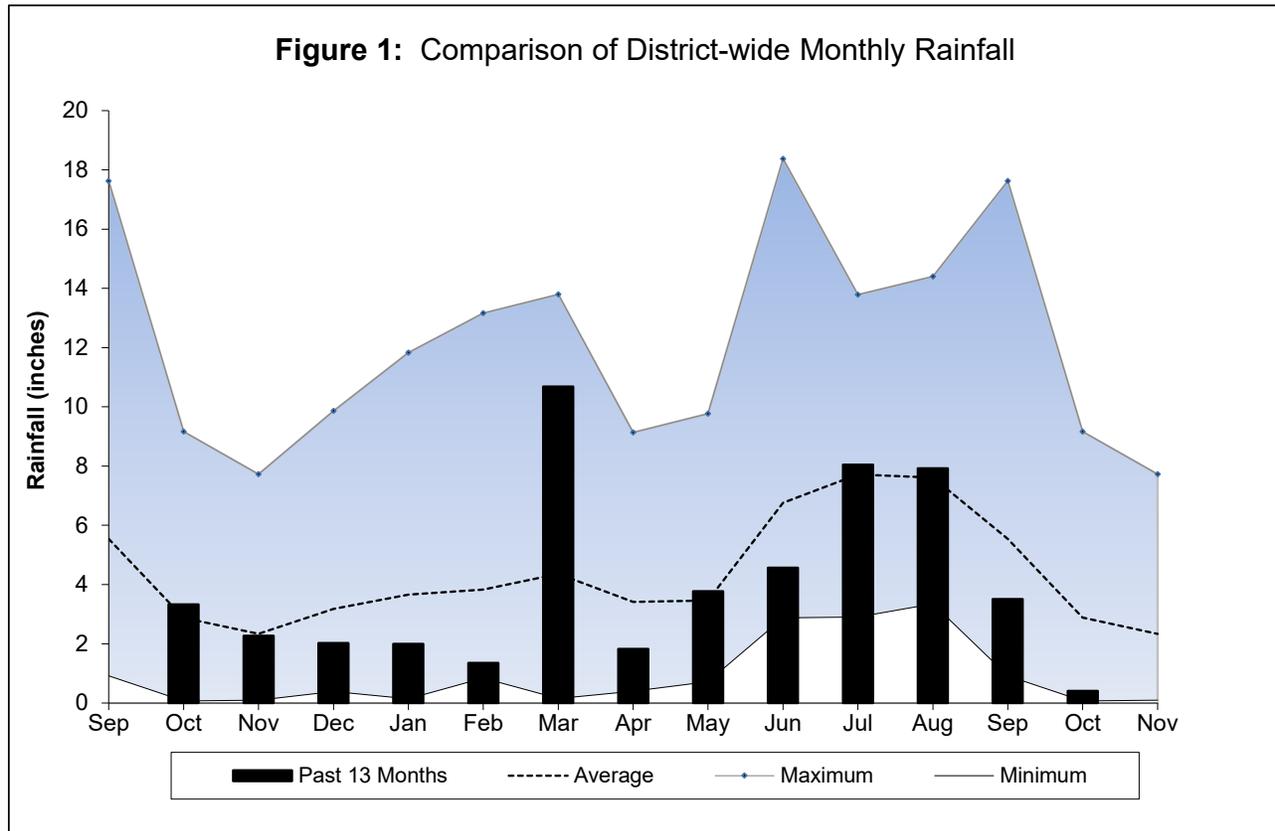


Figure 2: October 2022 SRWMD Gage-adjusted Radar Rainfall

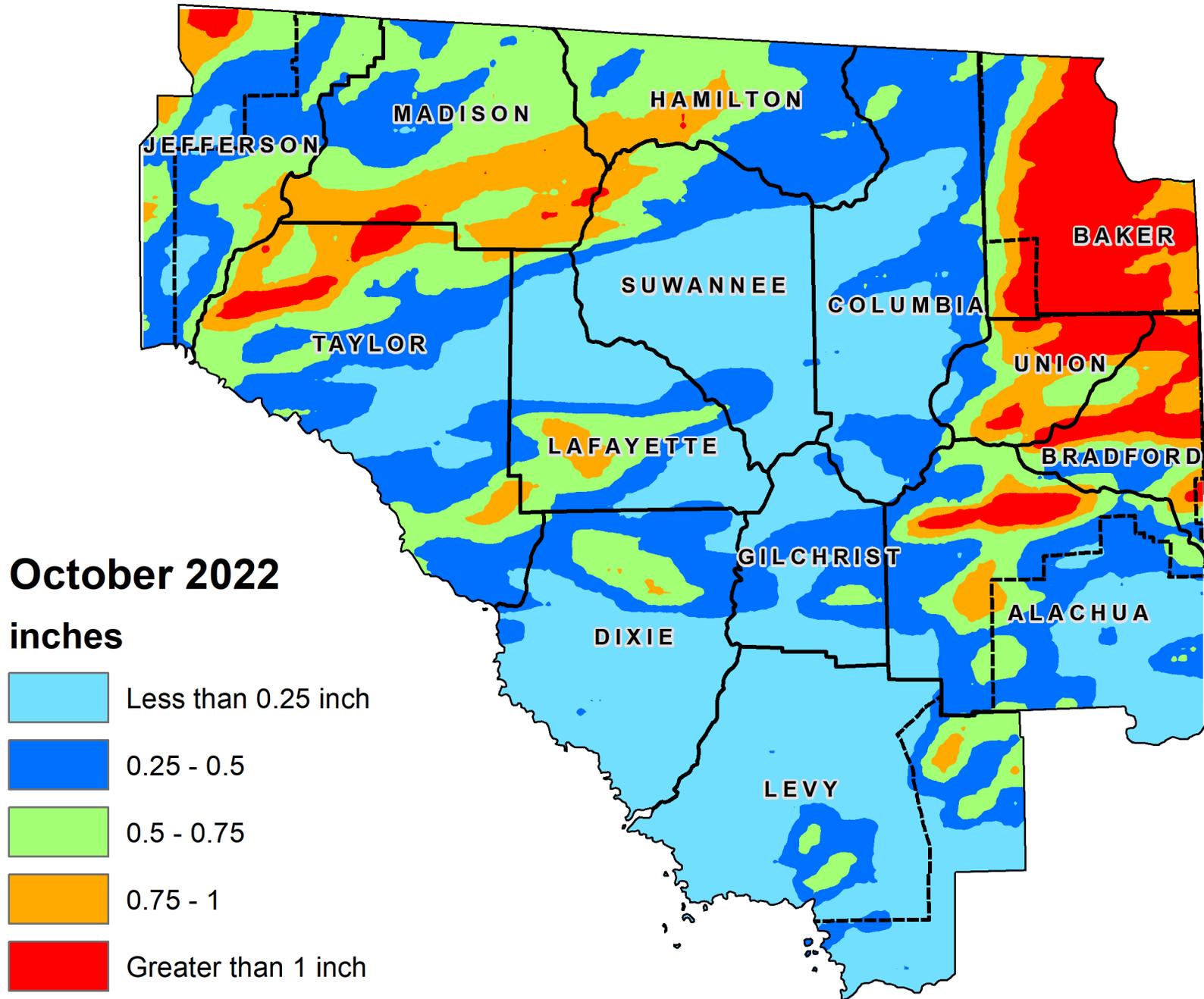


Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through October 31, 2022

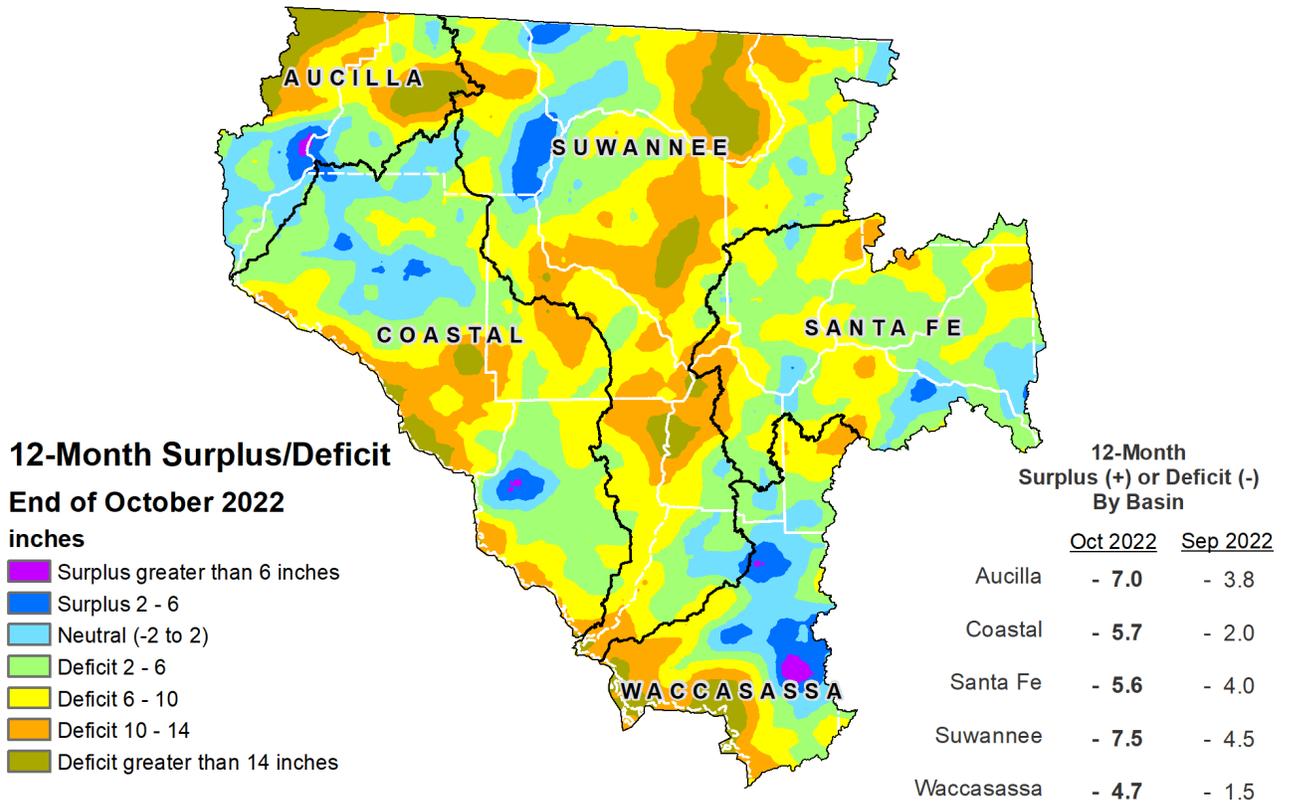


Figure 4: 3 - Month Rainfall Surplus/Deficit by River Basin through October 31, 2022

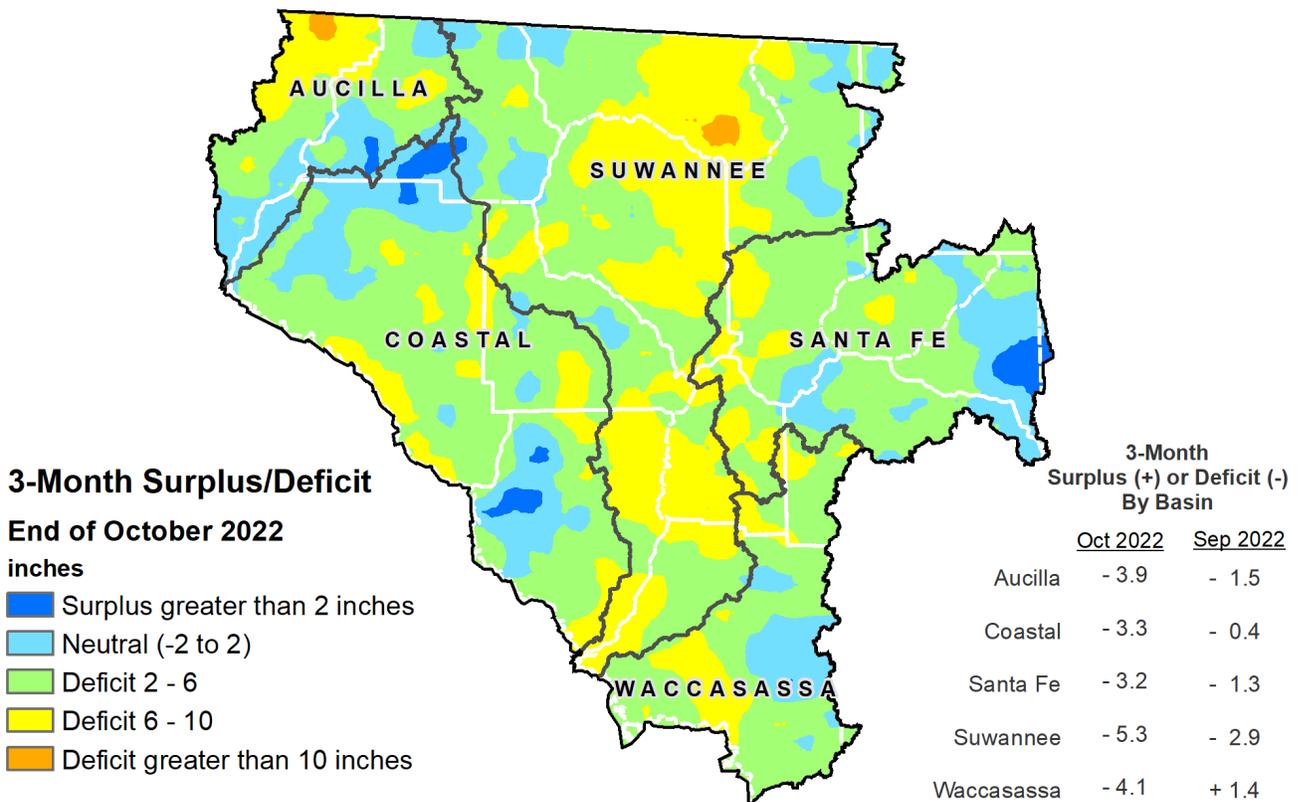


Figure 5: Daily River Flow Statistics

November 1, 2021 through October 31, 2022

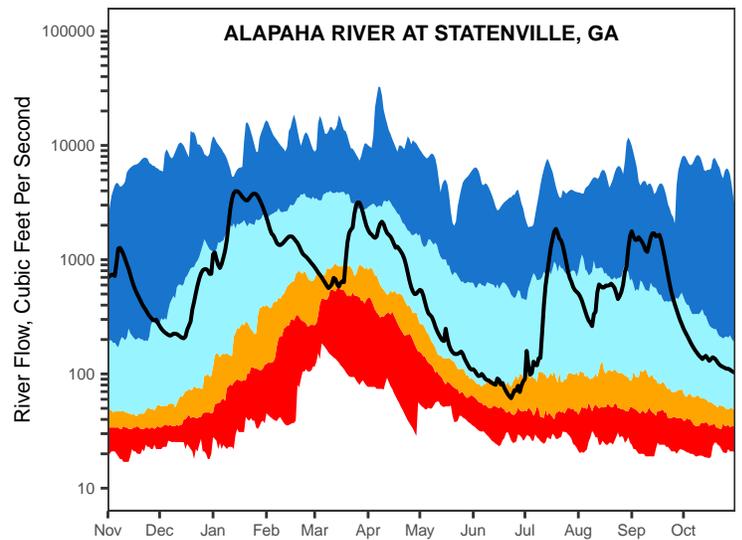
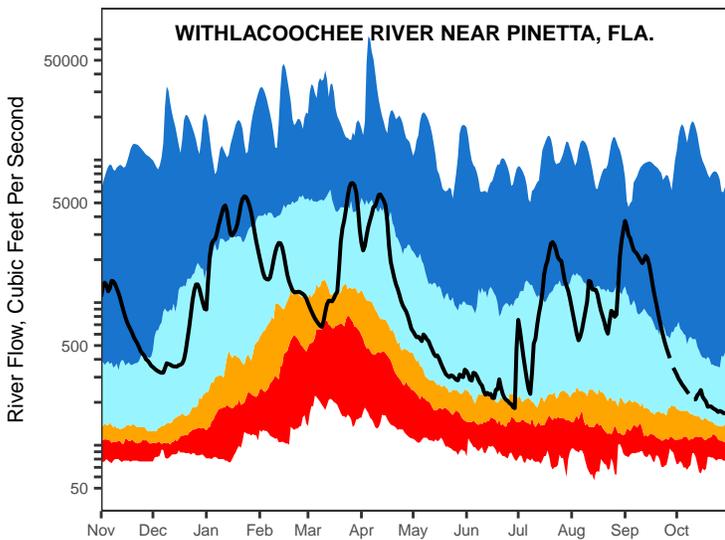
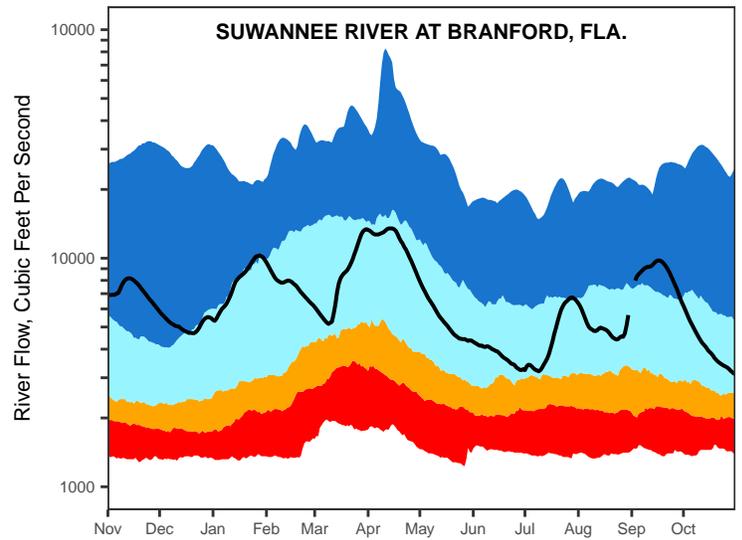
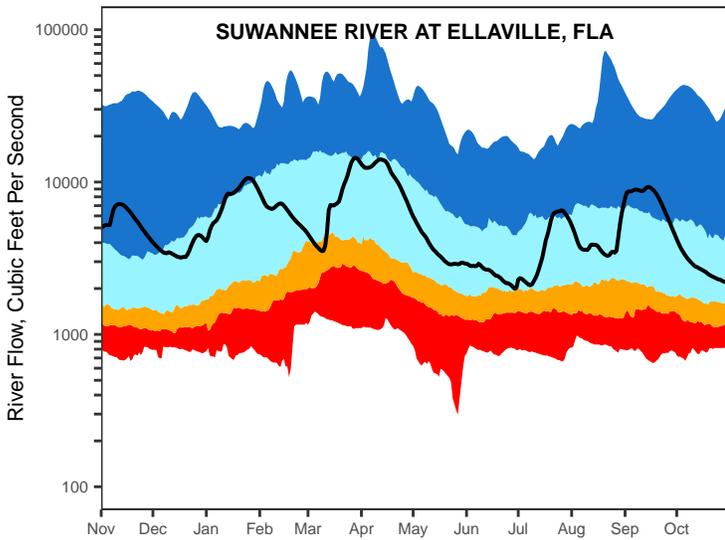
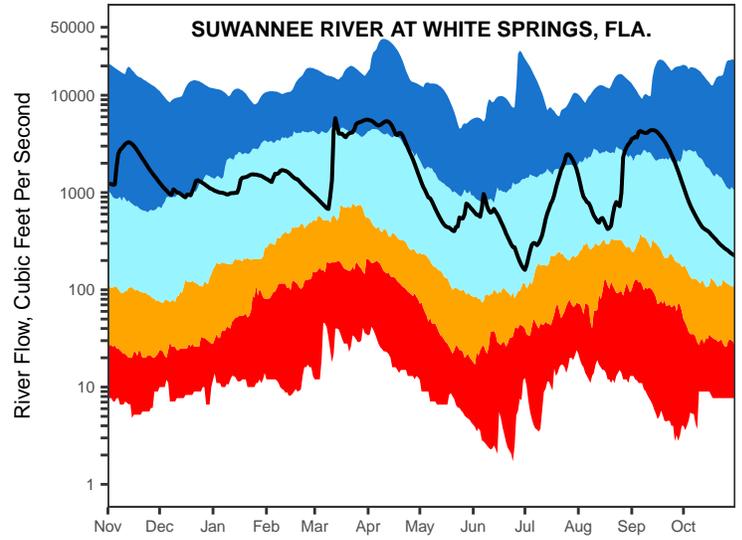
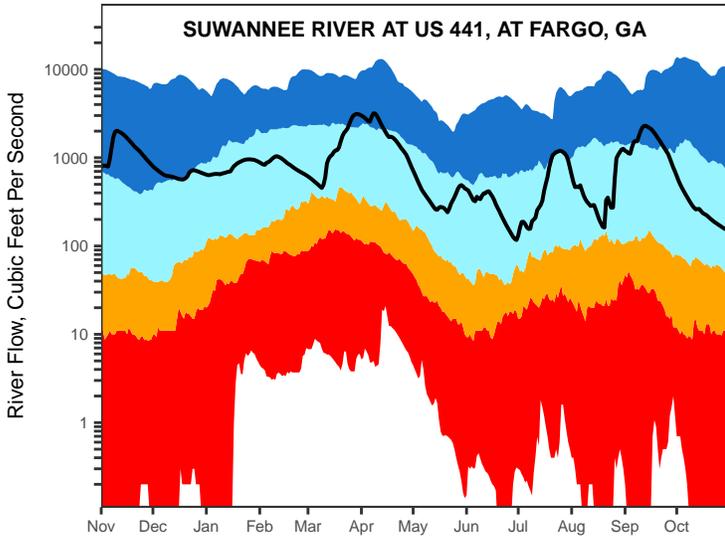
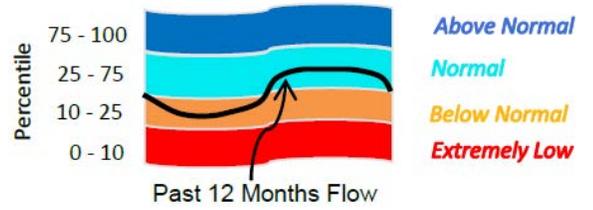
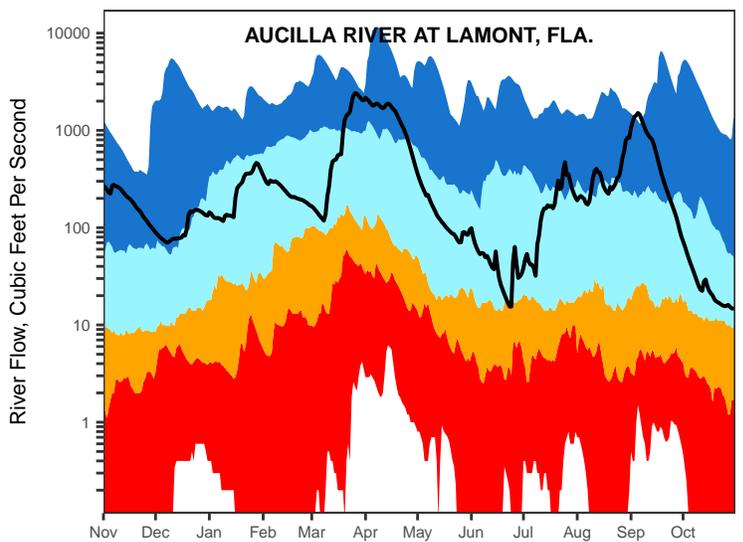
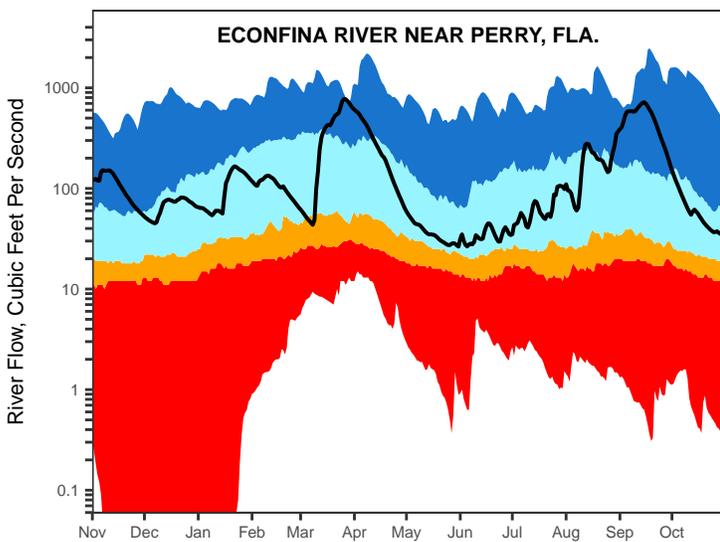
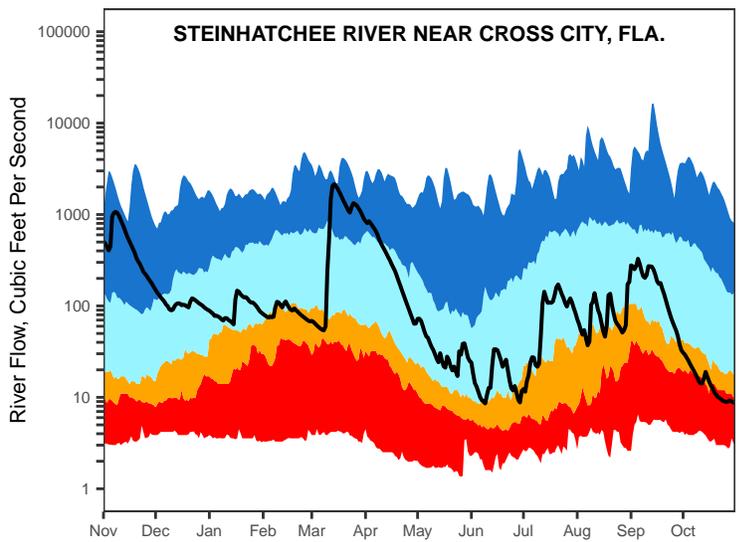
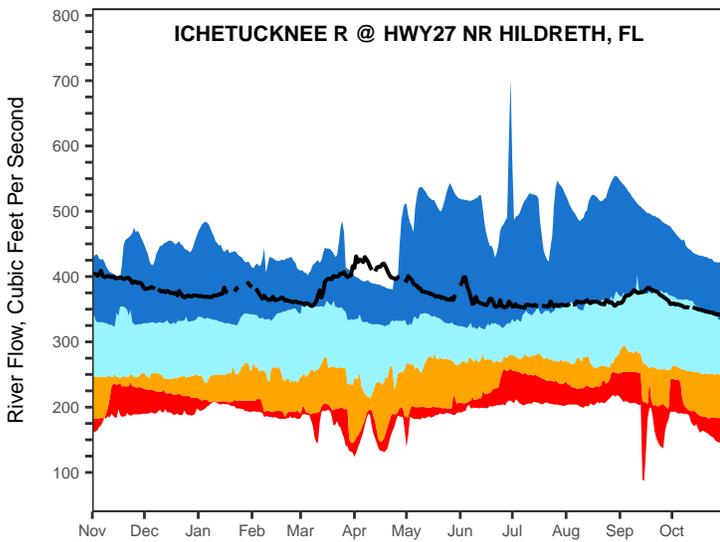
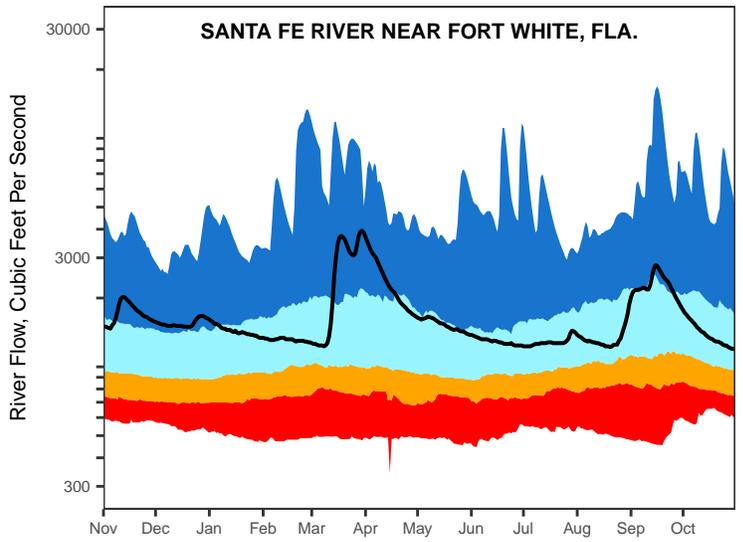
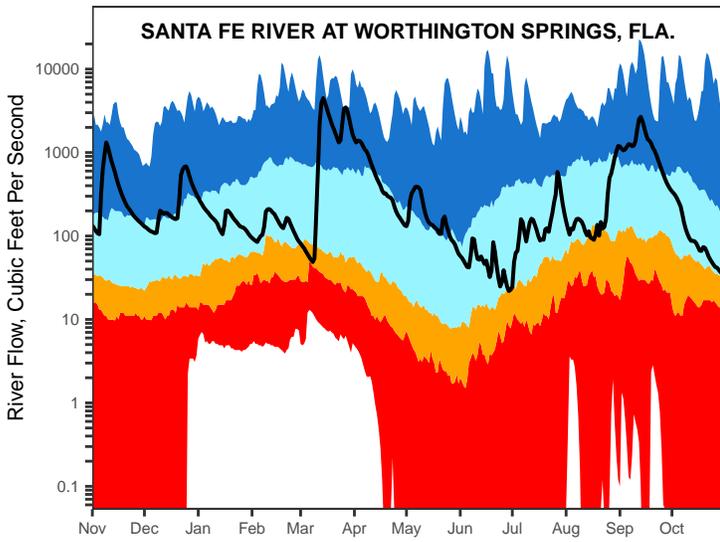
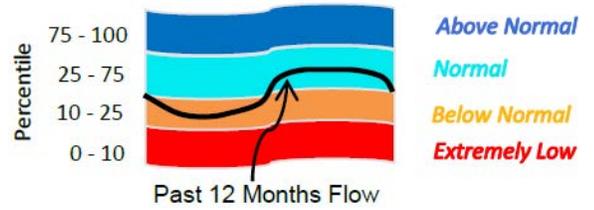


Figure 5, cont.: Daily River Flow Statistics

November 1, 2021 through October 31, 2022



**Figure 6:
Streamflow Conditions
October 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.

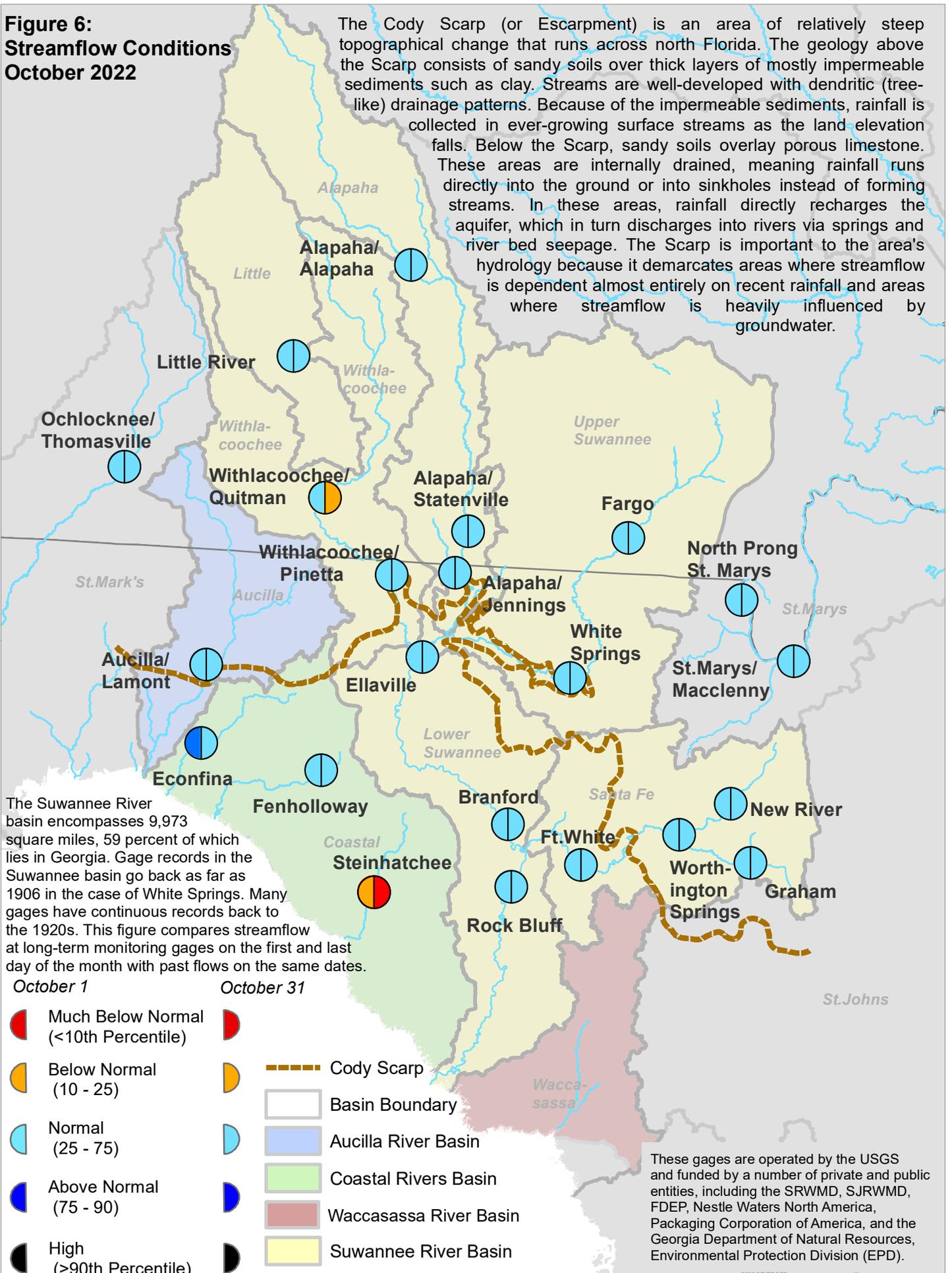
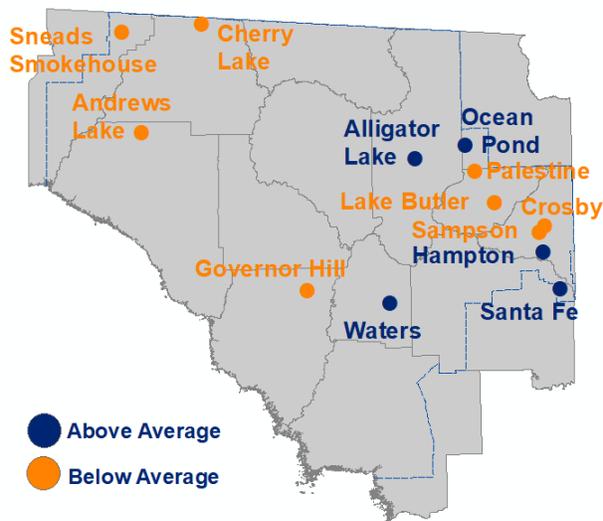


Figure 7: October 2022 Lake Levels



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.

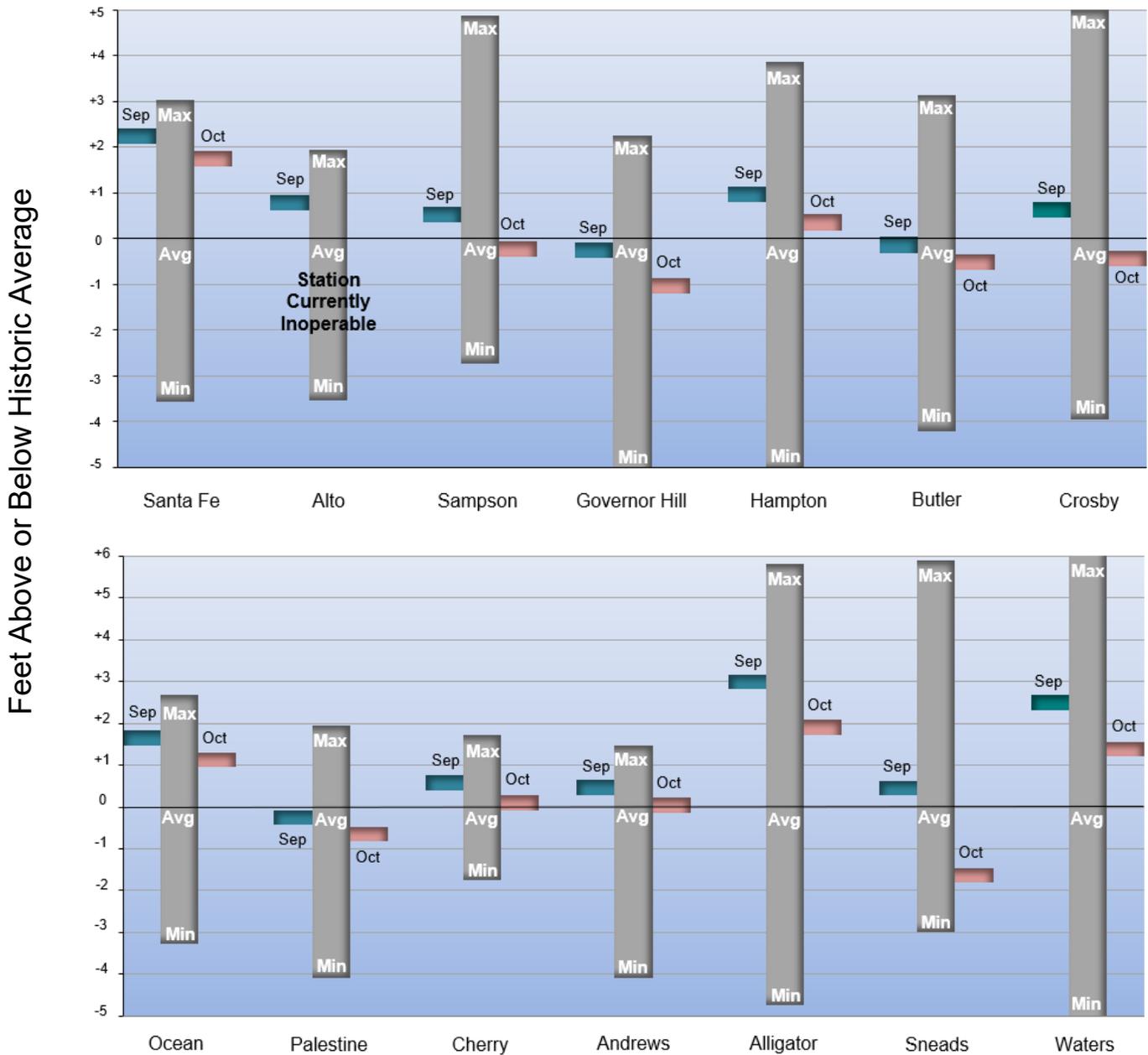


Figure 8: Flow Over the Past 12 Months, Lafayette Blue Spring (cubic feet per second)

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

Period 12 Month 11/01/2021 to 11/01/2022

2021-22

Percentile statistics are calculated using data from 04/23/1985 to 09/30/2020

Lafayette_Blue

Max-Q75

Q75-Q25

Q25-Q10

Q10-Min

Archived Data

Provisional Data

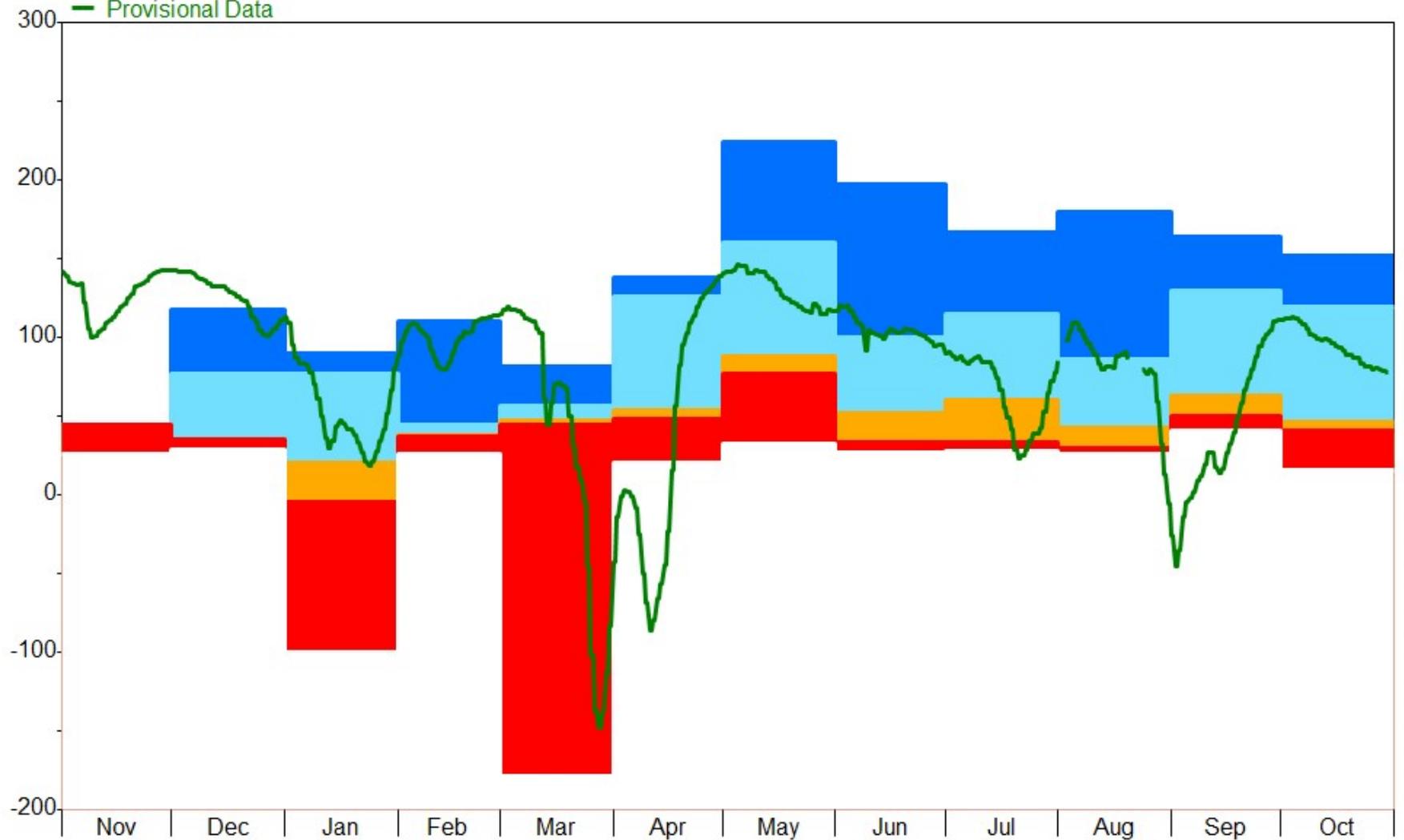


Figure 9: Flow Over the Past 12 Months, Wacissa River (cubic feet per second)

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

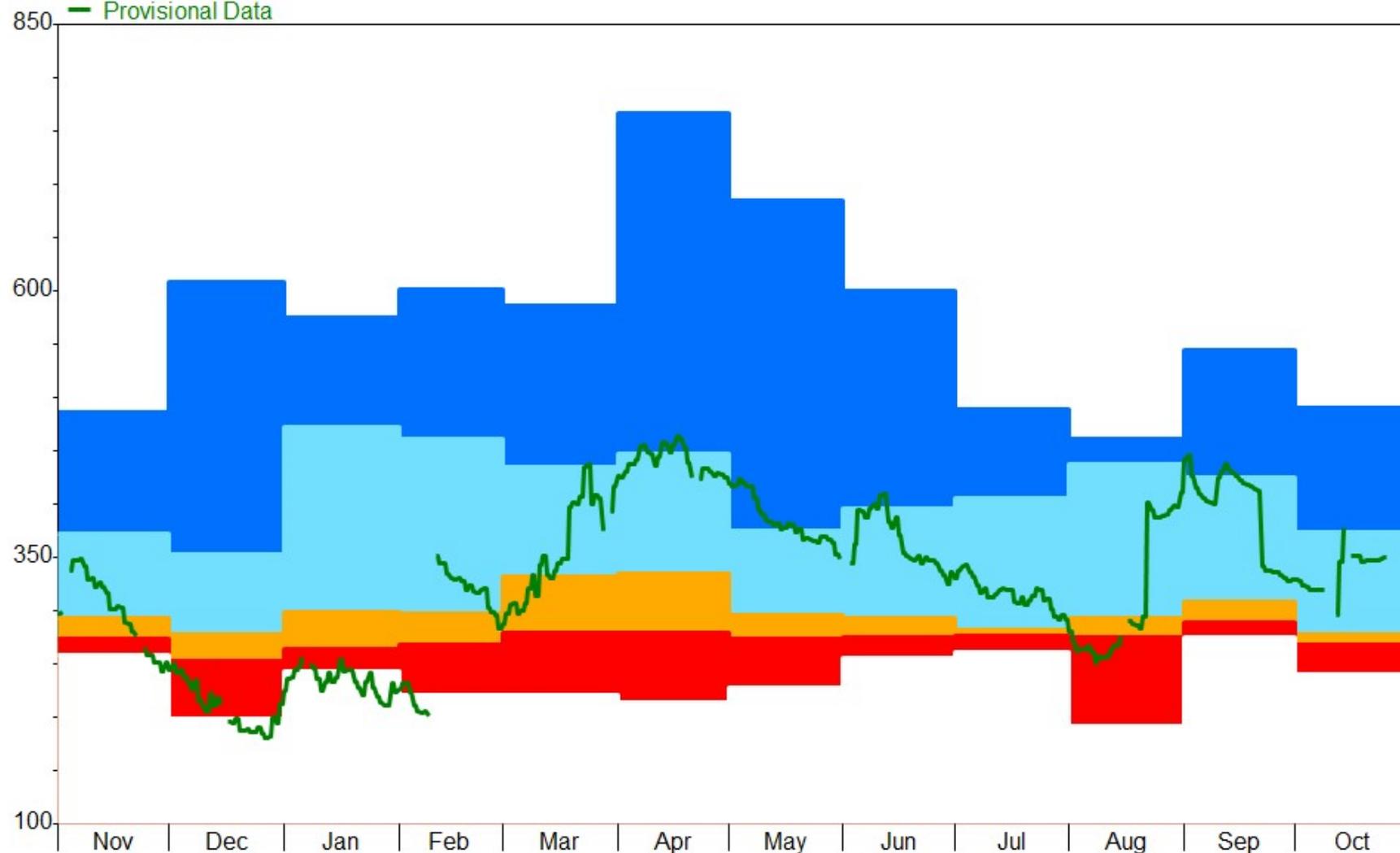
Period 12 Month 11/01/2021 to 11/01/2022

Percentile statistics are calculated using data from 06/04/1971 to 09/30/2020

2021-22

Wacissa

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



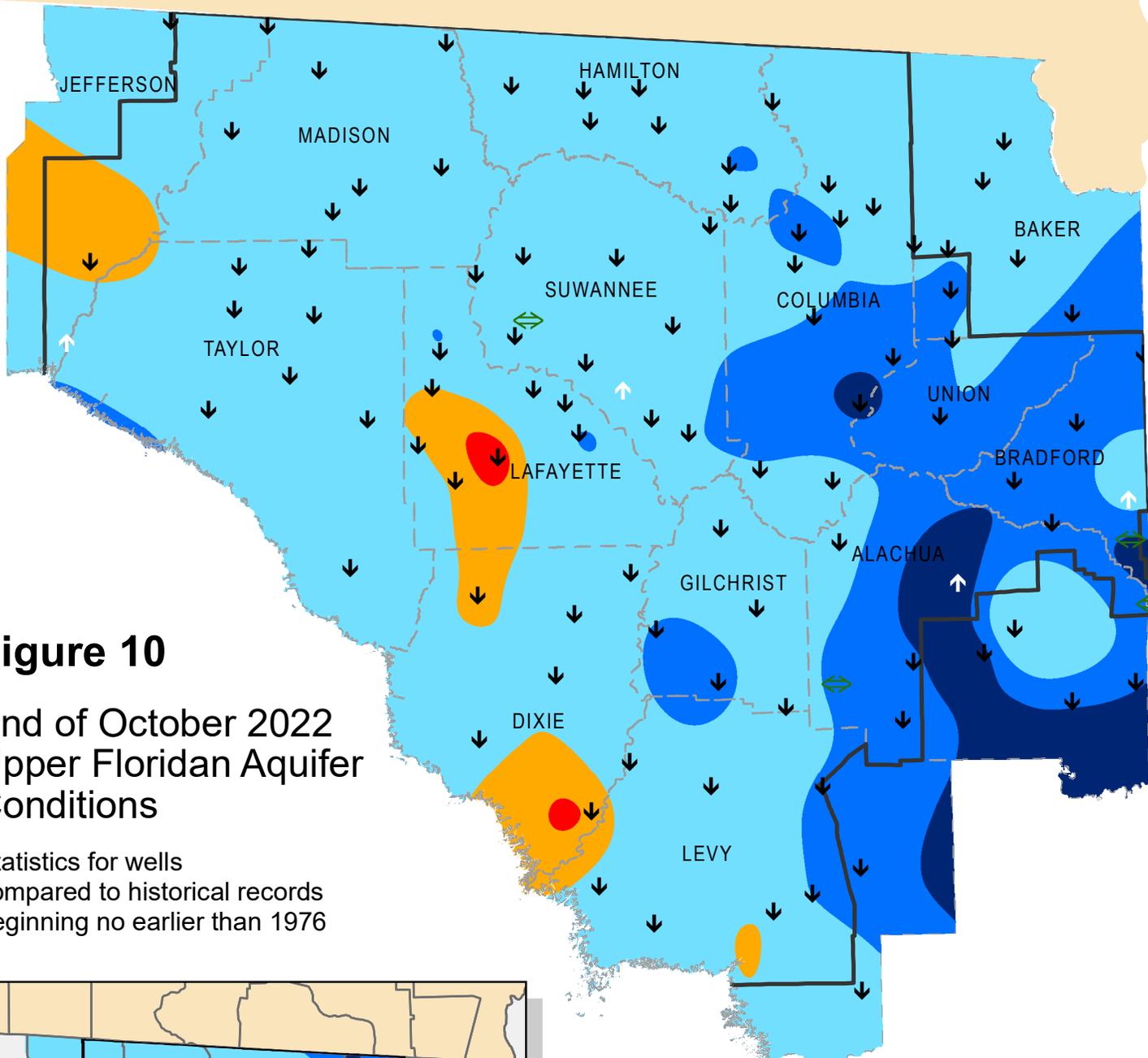
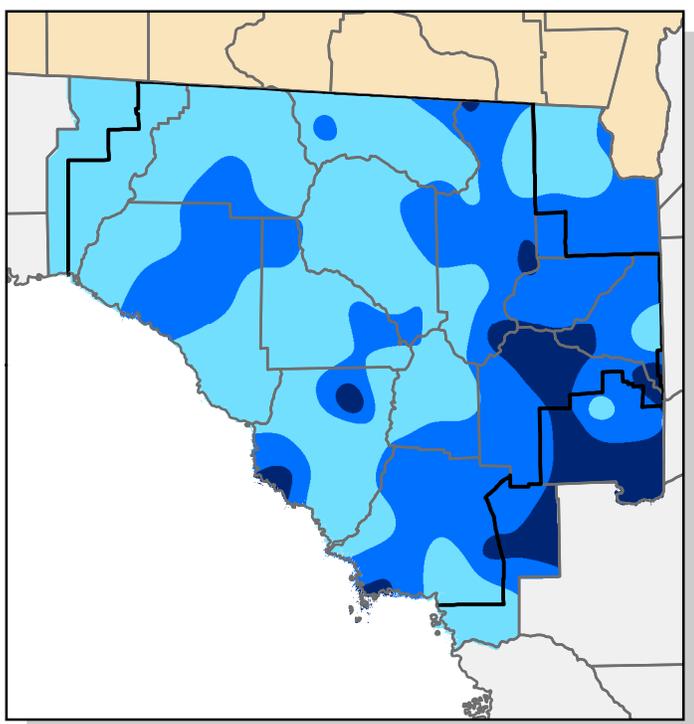


Figure 10

**End of October 2022
Upper Floridan Aquifer
Conditions**

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



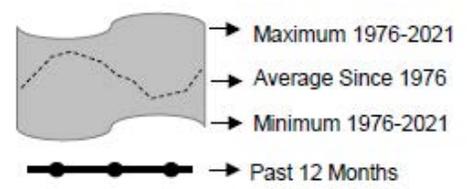
Inset: September Groundwater Percentiles

Additional wells courtesy of SJRWMD, SWFWMD and USGS

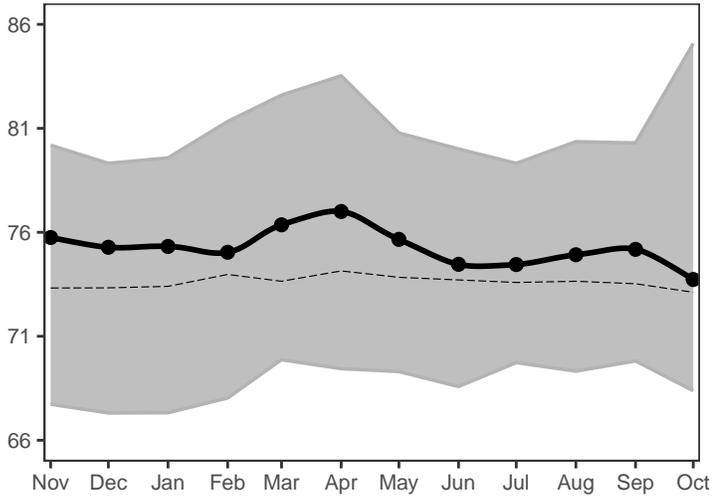
- Extremely High
(Greater than 90th Percentile)
- High
(75th to 90th Percentile)
- Normal
(25th to 75th Percentile)
- Low
(10th to 25th Percentile)
- Extremely Low
(Less than 10th Percentile)
- ↑ ↓ Increase/decrease in level since last month
- ↔ Increase/decrease since last month
less than one percent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

Figure 11: Monthly Groundwater Statistics

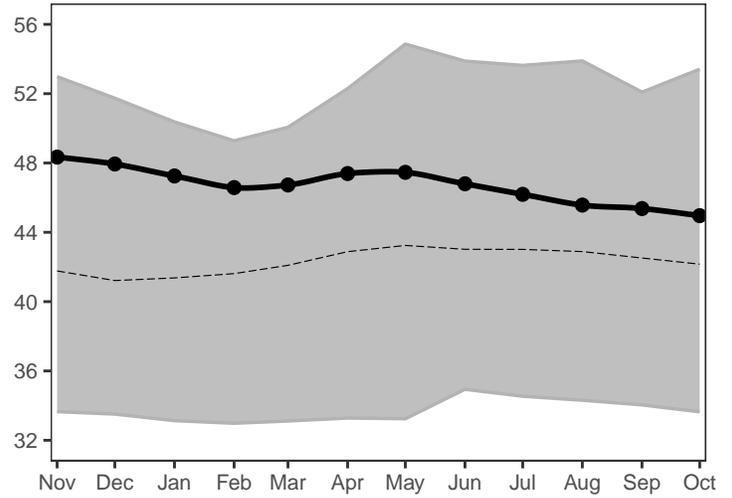
Levels November 2021 through October 2022
 Period of Record Beginning 1976



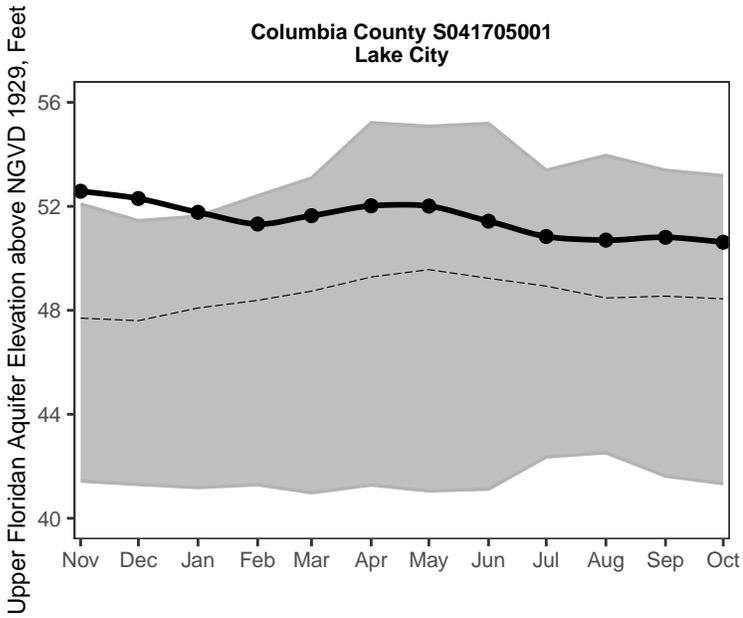
Madison County N010719001
near Greenville



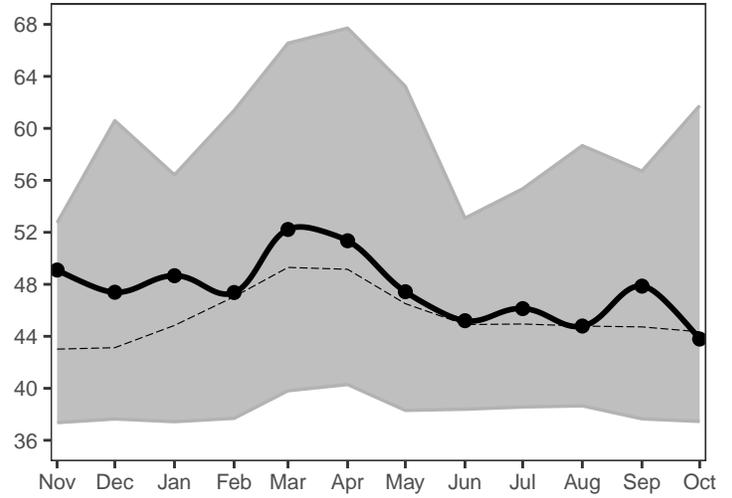
Suwannee County S021335001
near Live Oak



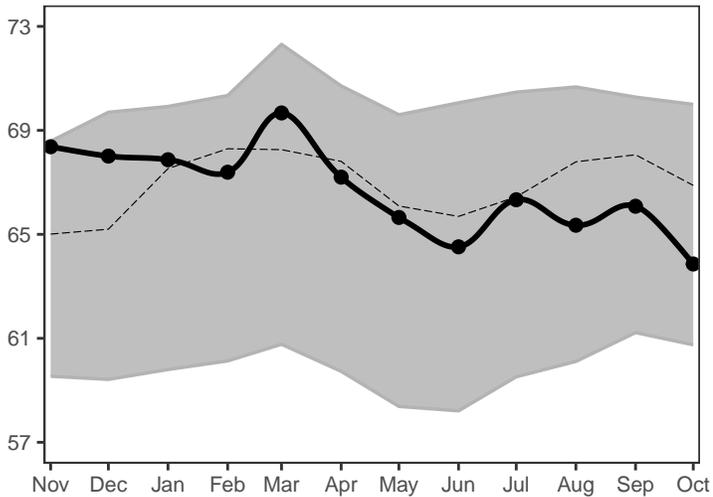
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S040736005
Perry

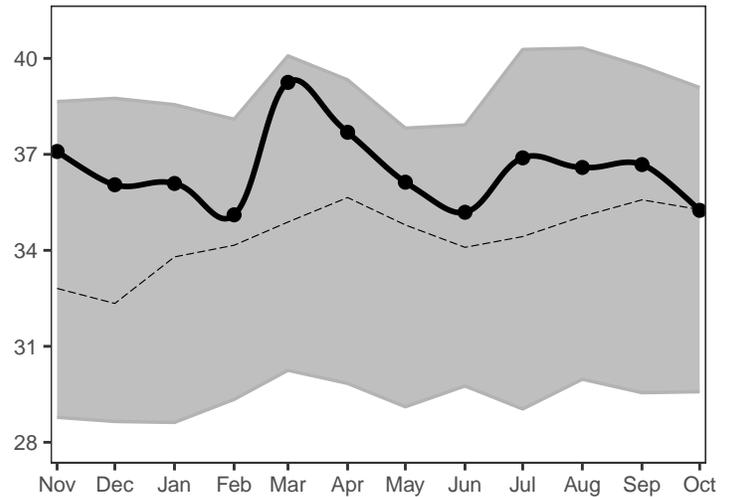
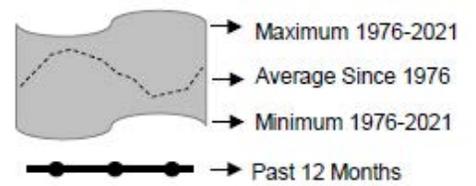
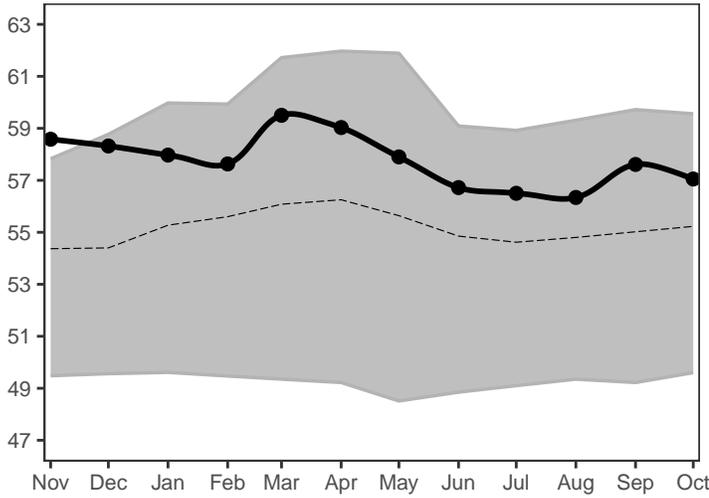


Figure 11, cont.: Monthly Groundwater Statistics

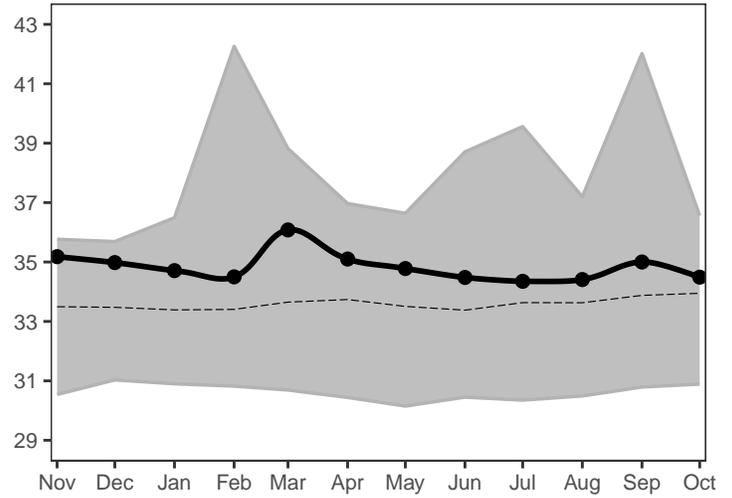
Levels November 2021 through October 2022
 Period of Record Beginning 1976



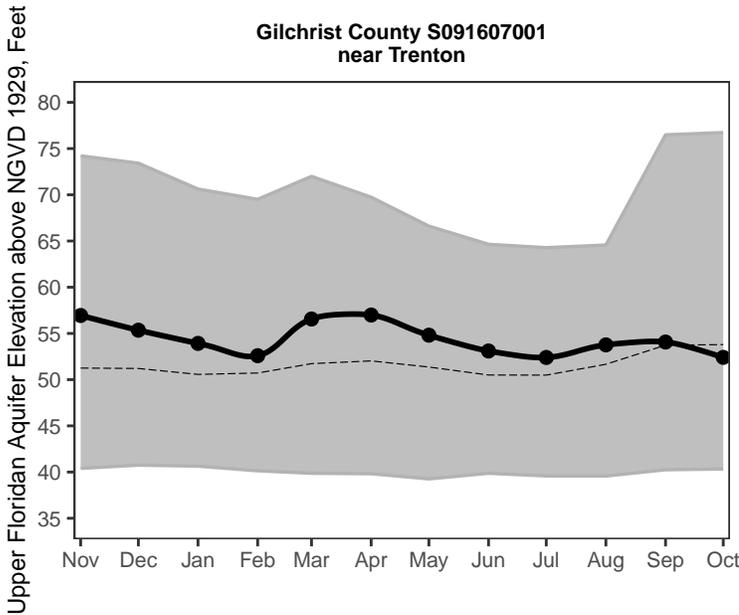
Union County S051933001
near Lake Butler



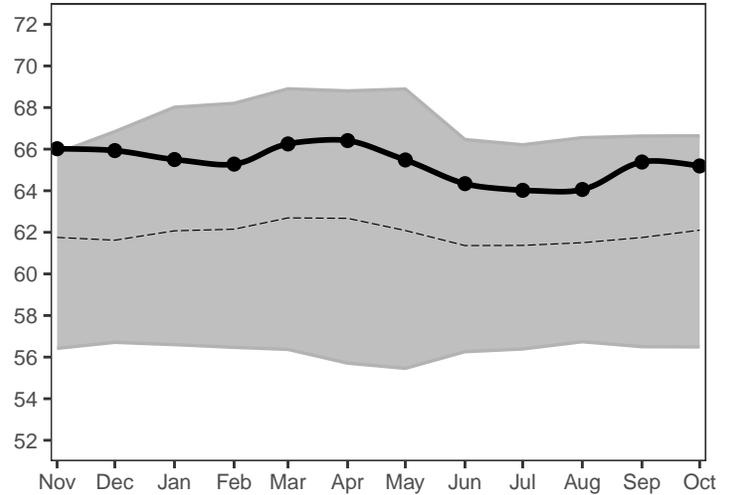
Alachua County S081703001
at High Springs



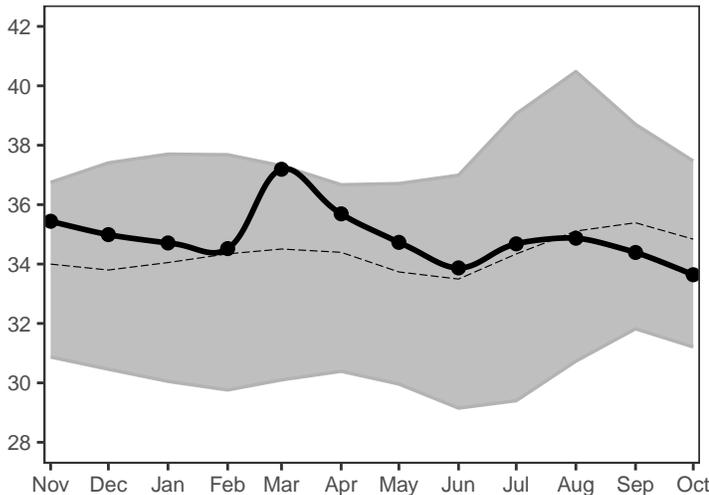
Gilchrist County S091607001
near Trenton



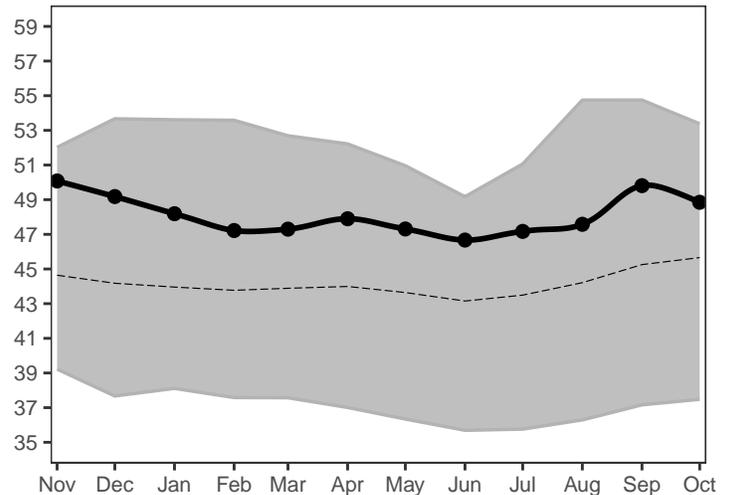
Bradford County S072132001
near Graham

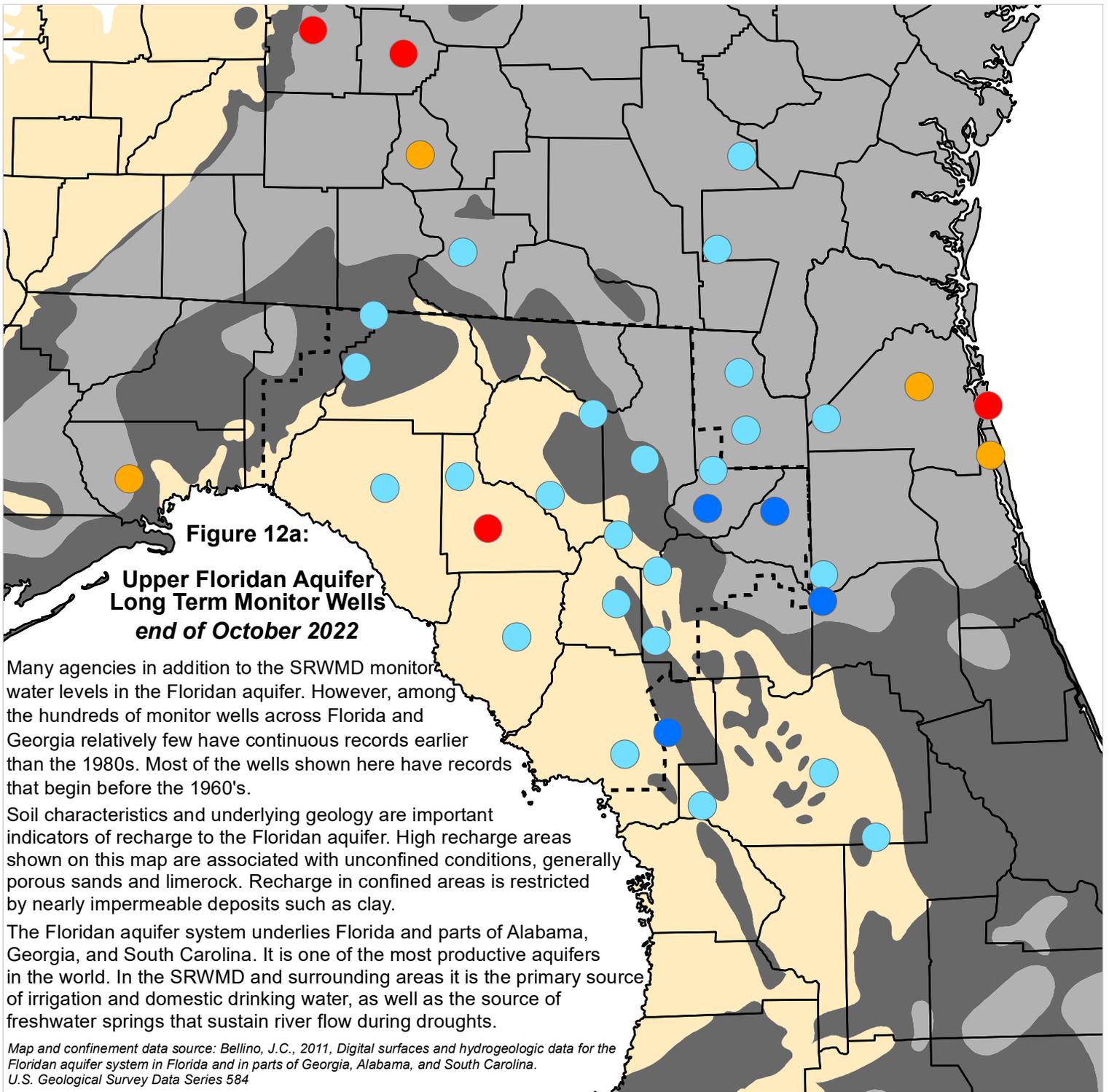


Dixie County S101210001
at Cross City



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 October 2022

