

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: September 30, 2022

RE: September 2022 Hydrologic Conditions Report

RAINFALL

- Districtwide average rainfall for the month was 3.51", which was about 37% lower than the 1932-2021 average of 5.54" (Table 1, Figure 1). The 12-month period ending September 30 reflected a Districtwide rainfall deficit of 3.43", which represented an increase in the 1.25" deficit seen at the end of August. Most District counties received between 2" and 6" of rainfall on average with portions Bradford, Alachua, and Jefferson counties receiving more than 8" (Figure 2).
- A 12-month rainfall deficit was present for all river basins, with the Waccasassa Basin transitioning from a surplus to a deficit in September (Figure 3). However, some portions of the Waccasassa Basin still showed a surplus greater than 10" by month's end. Large areas in the Aucilla, Suwannee, and Waccasassa basins showed rainfall deficits of greater than 10" at the end of the month. Four of the river basins exhibited 3-month rainfall deficits, some of which were ameliorated by the end of September (Figure 4). The Waccasassa Basin was the only basin to continue with a 3-month rainfall surplus, which increased by 0.3" from August to September.

SURFACE WATER

- **Rivers:** The river stations shown in Figure 5 finished the month in either the above normal (75th – 100th percentile), normal (25th – 75th percentile), or below normal (10th – 25th percentile) flow ranges. The Steinhatchee River gage had below normal flows at the end of September, while the Econfina River ended the month in the above normal flow range. All river gages in North Florida and South Georgia were also in either the above normal, normal, or below normal flow categories at the end of the month (Figure 6). Six of these river gages showed high (>90th percentile) flows at the beginning of the month but fell into the normal flow category by the end of September.
- **Lakes:** Water levels increased at most of the monitored lakes in the District this month (Figure 7). The median increase in stage across all measured lakes was around 0.03'. Both Sampson and Crosby showed stage increases of just over 2' by the end of September. Governor Hill, Butler, and Palestine lakes all ended the month below their respective long-term averages.
- **Springs:** Flow measurements were made during September at 4 springs by the U.S. Geological Survey (USGS), District staff, and contractors. Fanning Springs began the month in the normal flow range, fell into the low flow range, but concluded the month in the high flow category (Figure 8). Manatee Springs spent the majority of September in the normal flow range before transitioning into the high flow category at the end of the month (Figure 9).

GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District exhibited either normal (25th – 75th percentile), high (75th – 90th percentile), or extremely high (> 90th percentile) ranges at the end of September (Figure 10). One area of Lafayette County that showed a low (10th – 25th percentile) level at the end of August improved to the normal range by the end of September. Overall, groundwater levels increased by a median of about 1' since the end of August and ended September with a Districtwide average around the 74th percentile.

Most county index wells remained higher than the historical monthly average levels at the end of September except for wells in Lafayette and Dixie counties (Figure 11). The long-term District UFA well levels ended the month either within the low, normal, or high categories (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 at 91% from September to November with the chances decreasing to 54% from January to March 2023.

The NOAA three-month seasonal outlook favors above normal temperatures along with below normal rainfall chances throughout the District from October through December. The U.S. Drought Monitor report released on September 29, 2022, showed no portions of the District with drought 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>.

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 (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	September 2022	September Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal
Alachua	5.14	5.77	89%	50.77	97%
Baker	4.62	5.64	82%	50.88	96%
Bradford	6.30	5.89	107%	51.13	99%
Columbia	2.64	5.38	49%	51.17	97%
Dixie	3.82	6.18	62%	51.21	88%
Gilchrist	2.47	5.80	43%	49.61	91%
Hamilton	2.37	4.83	49%	48.95	94%
Jefferson	3.14	5.04	62%	49.50	88%
Lafayette	2.64	5.56	47%	50.73	92%
Levy	4.69	6.46	73%	53.44	95%
Madison	3.39	4.66	73%	51.47	96%
Suwannee	2.42	5.23	46%	49.38	93%
Taylor	4.38	5.58	79%	53.31	94%
Union	3.45	5.73	60%	49.99	95%

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

September 2022 District Average 3.51
 September Long-Term Average (1932-2021) 5.54
 Historical 12-month Average (1932-2021) 54.73
 Past 12-Month Total 51.30
 12-Month Rainfall **Surplus/Deficit** **-3.43**

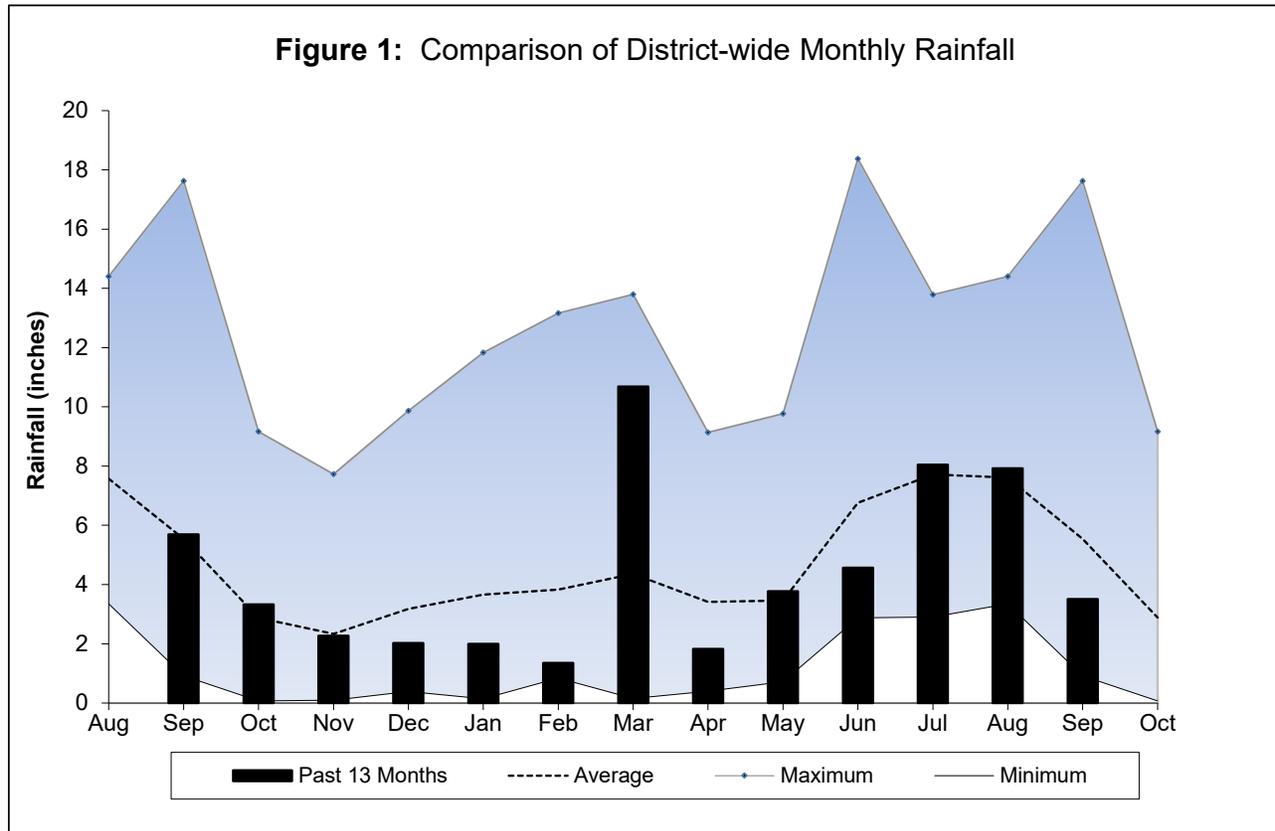


Figure 2: September 2022 SRWMD Gage-adjusted Radar Rainfall

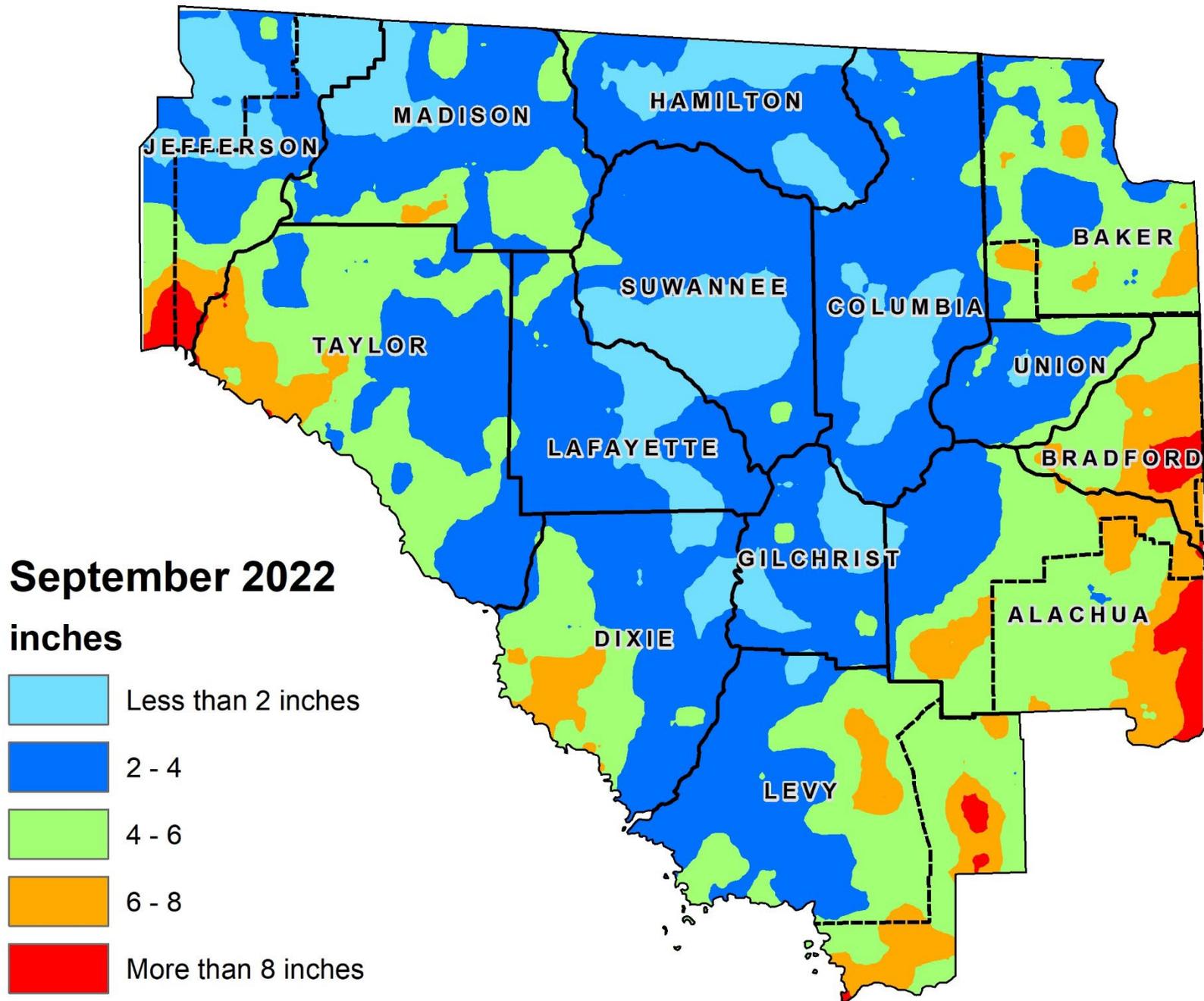


Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through September 30, 2022

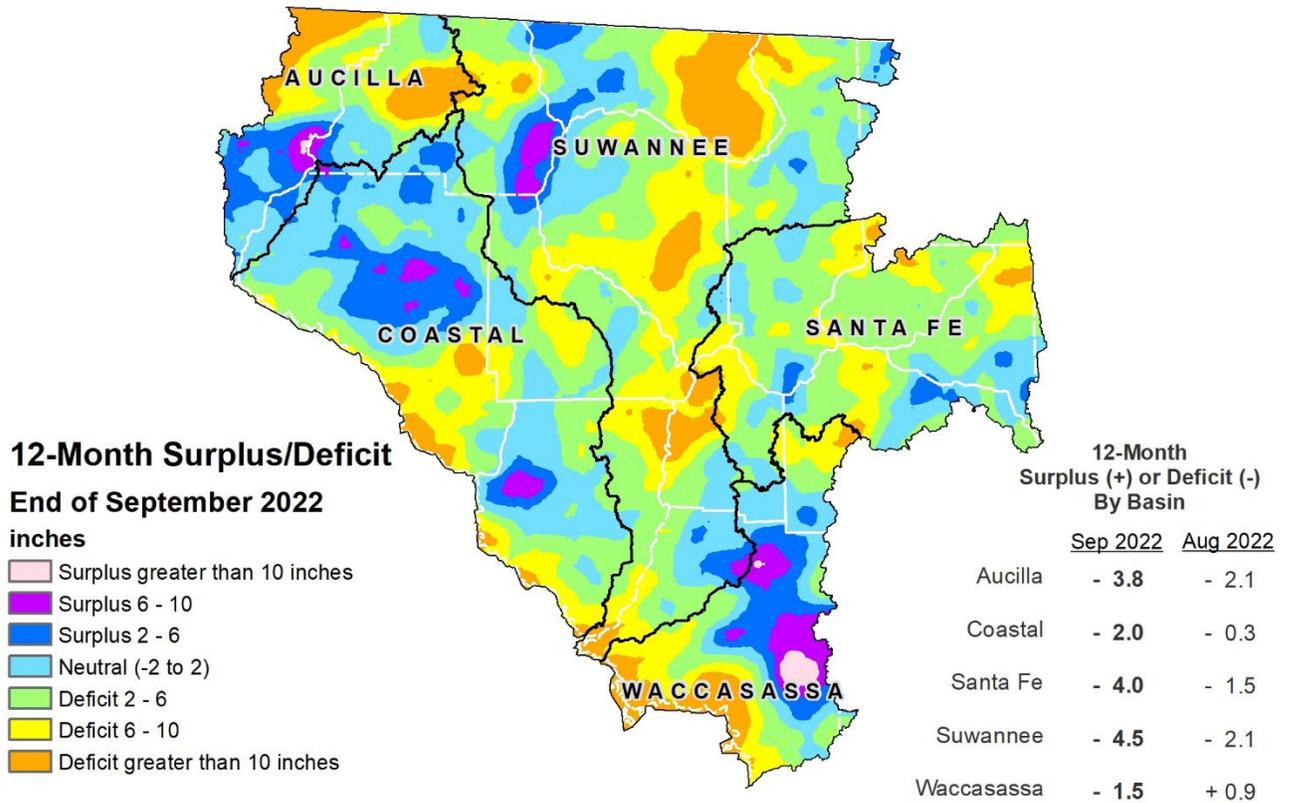


Figure 4: 3 - Month Rainfall Surplus/Deficit by River Basin through September 30, 2022

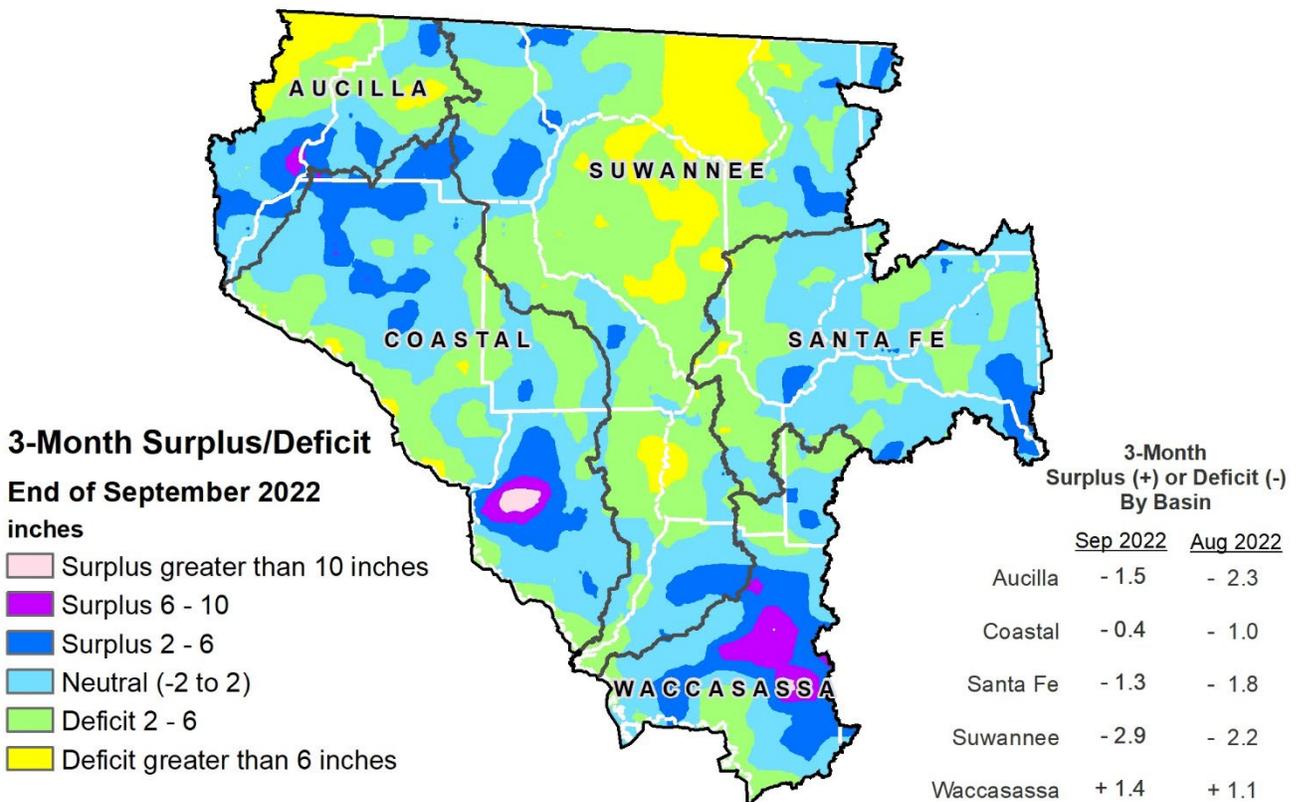


Figure 5: Daily River Flow Statistics

October 1, 2021 through September 30, 2022

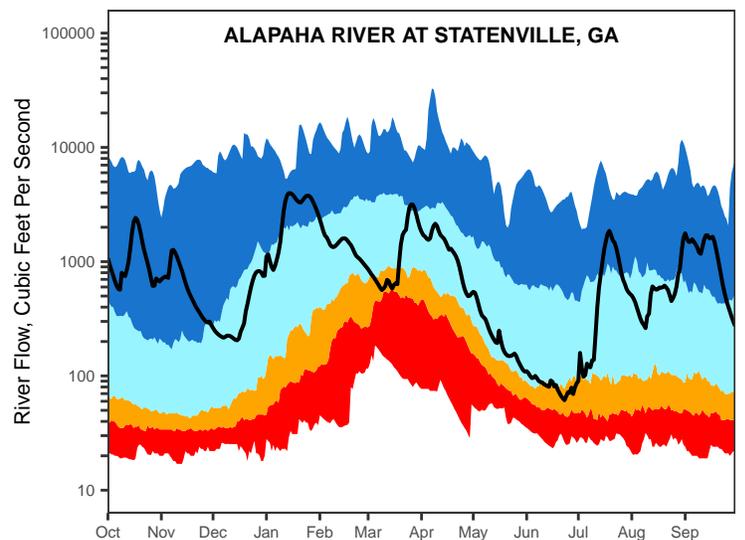
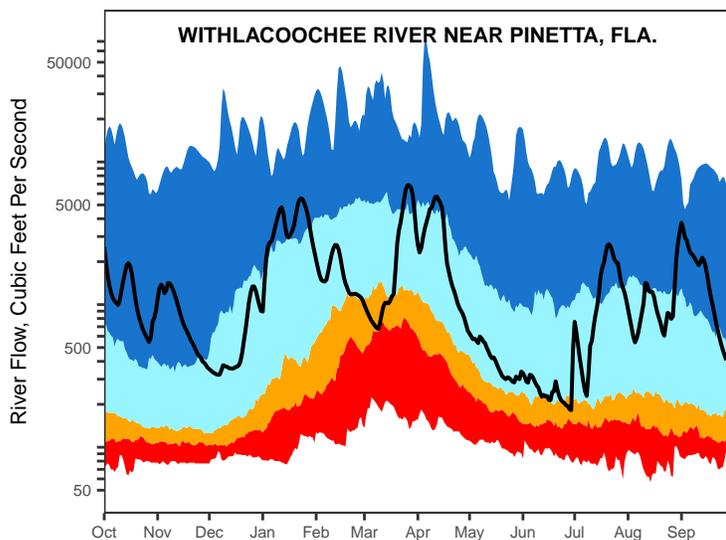
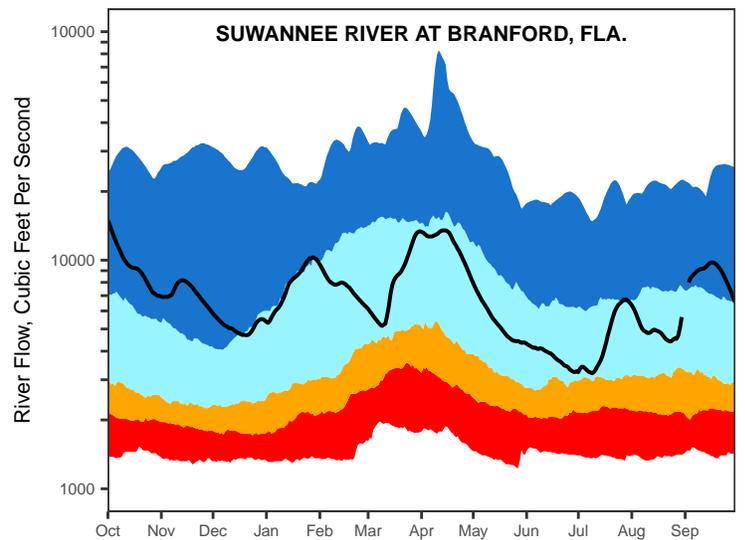
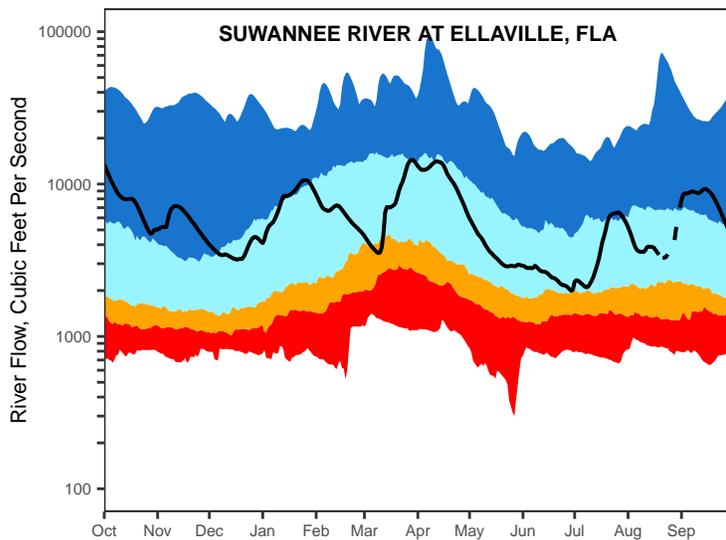
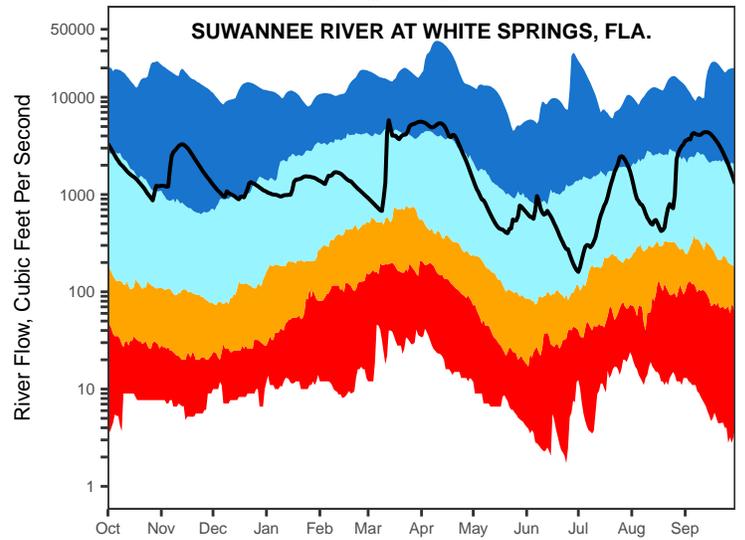
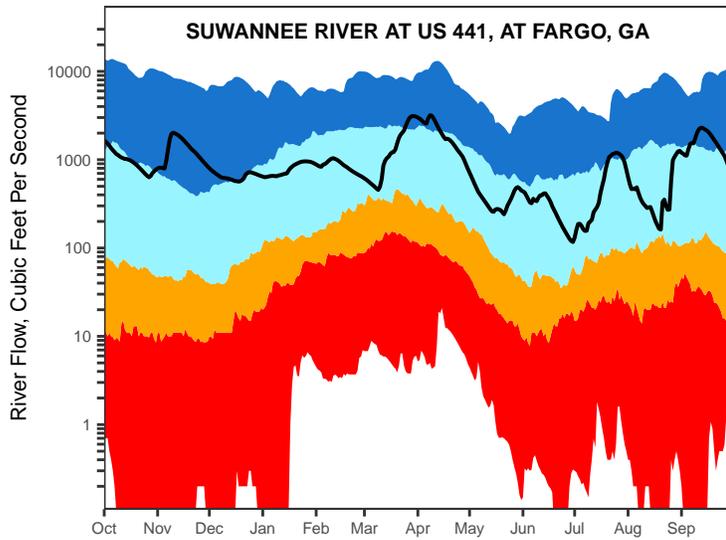
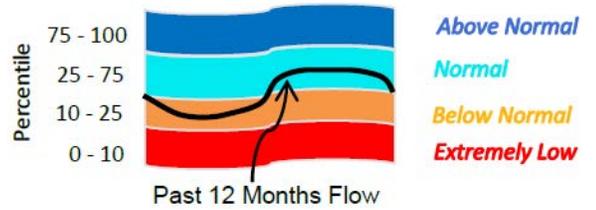
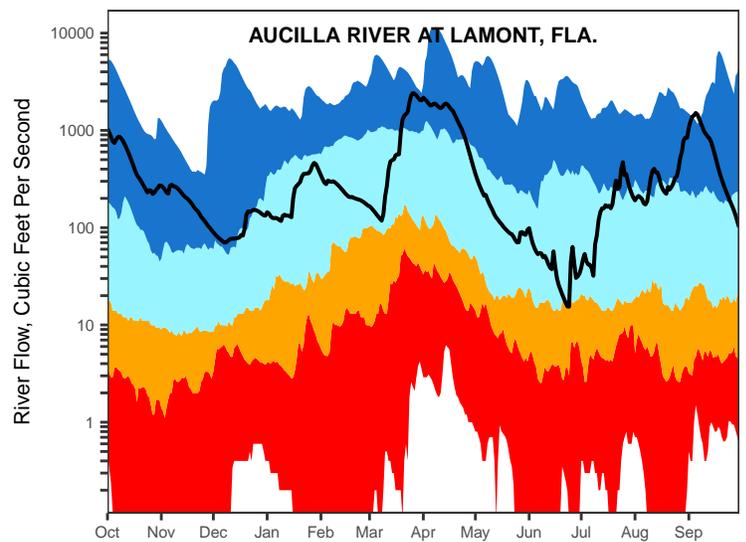
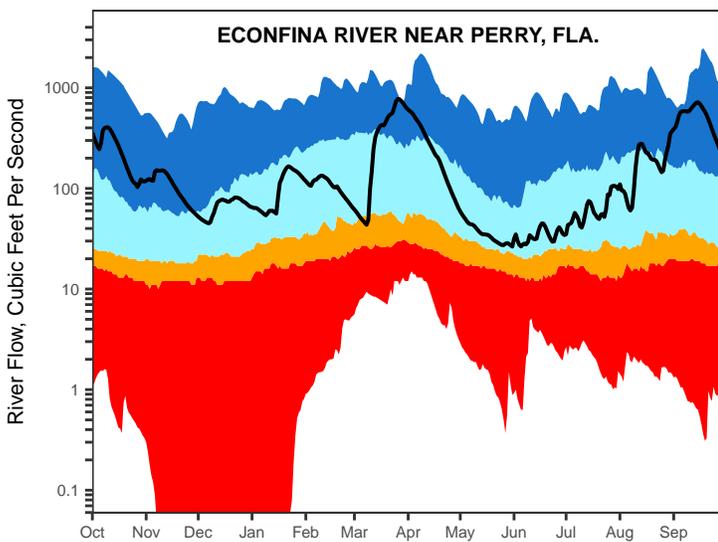
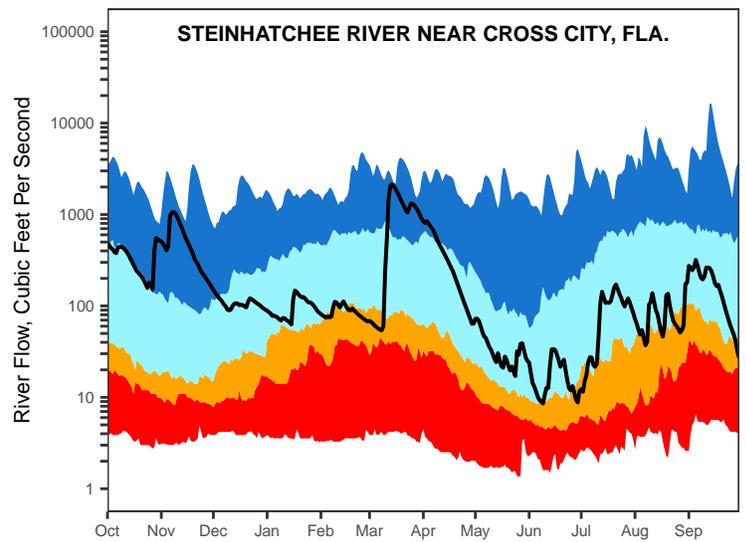
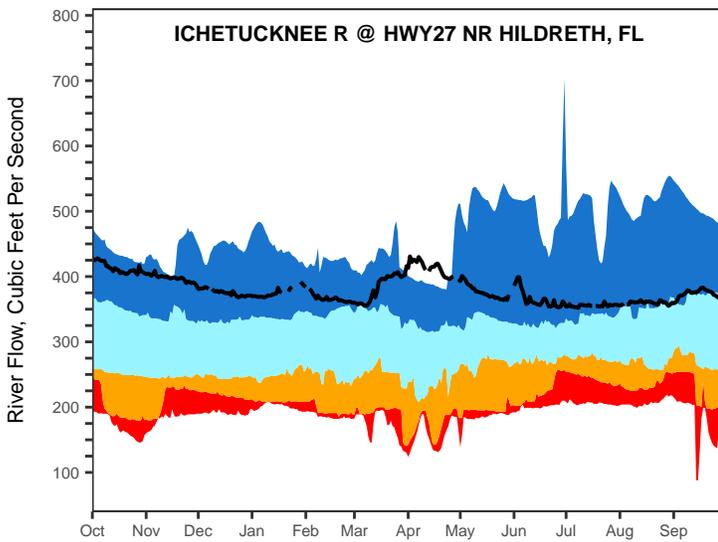
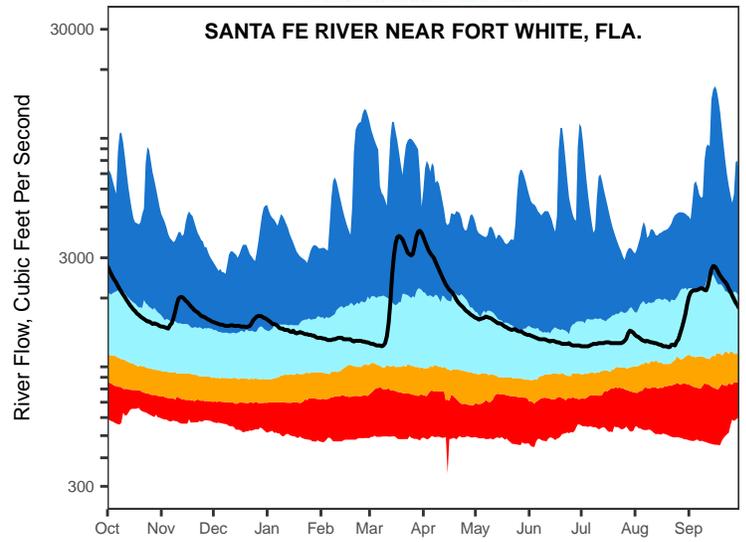
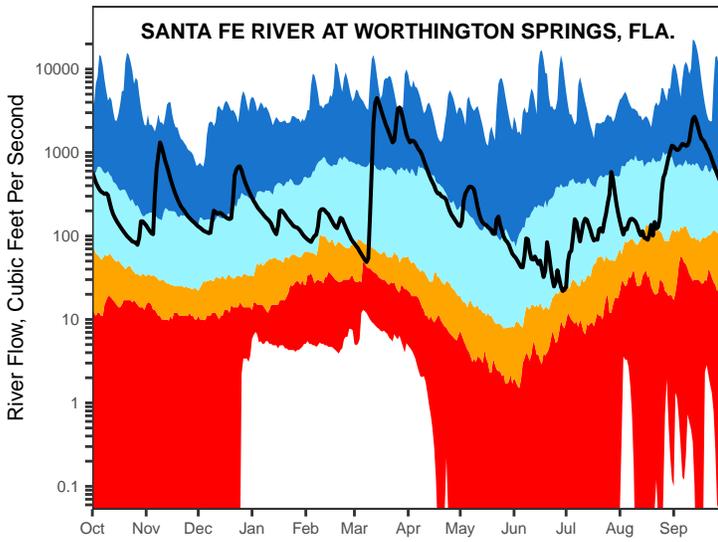
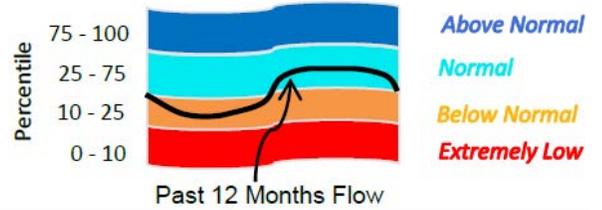


Figure 5, cont.: Daily River Flow Statistics

October 1, 2021 through September 30, 2022

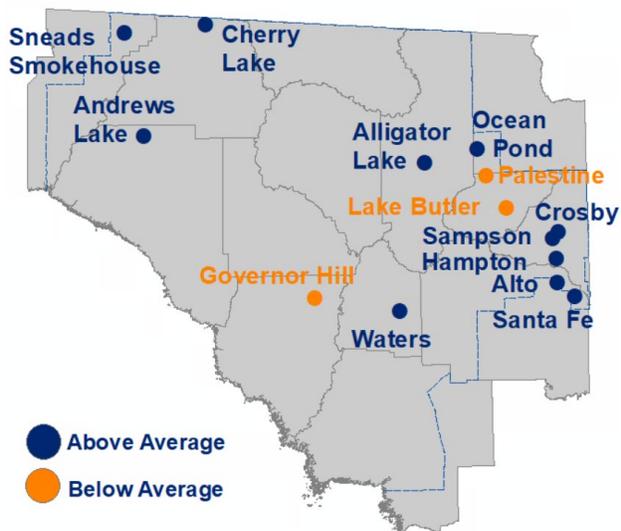


**Figure 6:
Streamflow Conditions
September 2022**

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: September 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.

Feet Above or Below Historic Average

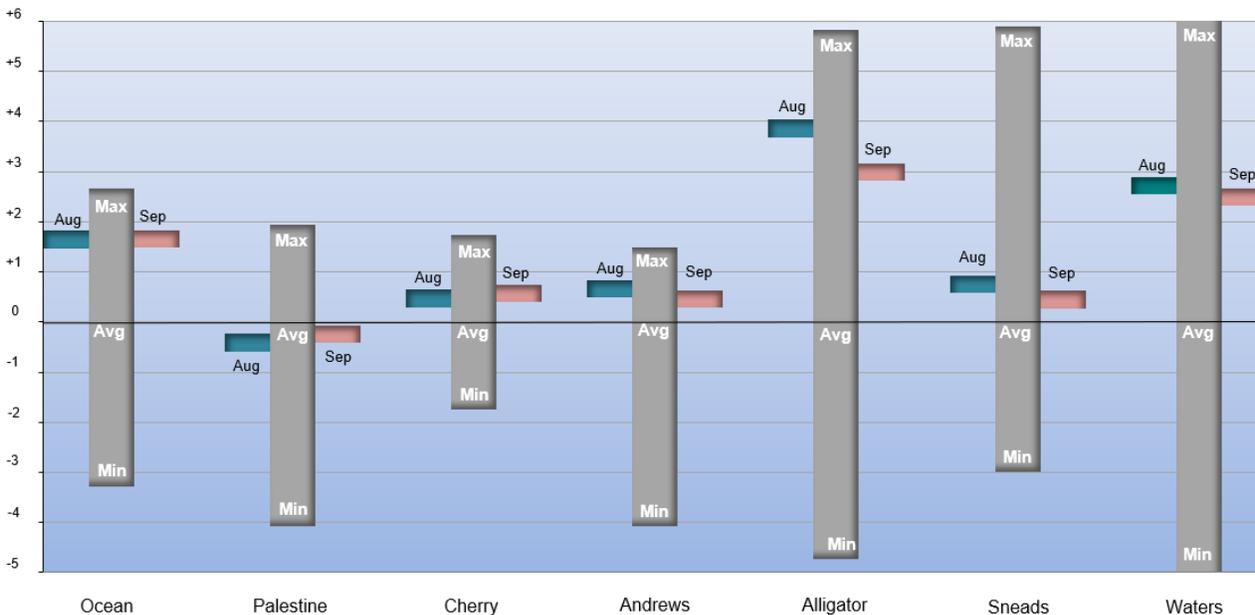
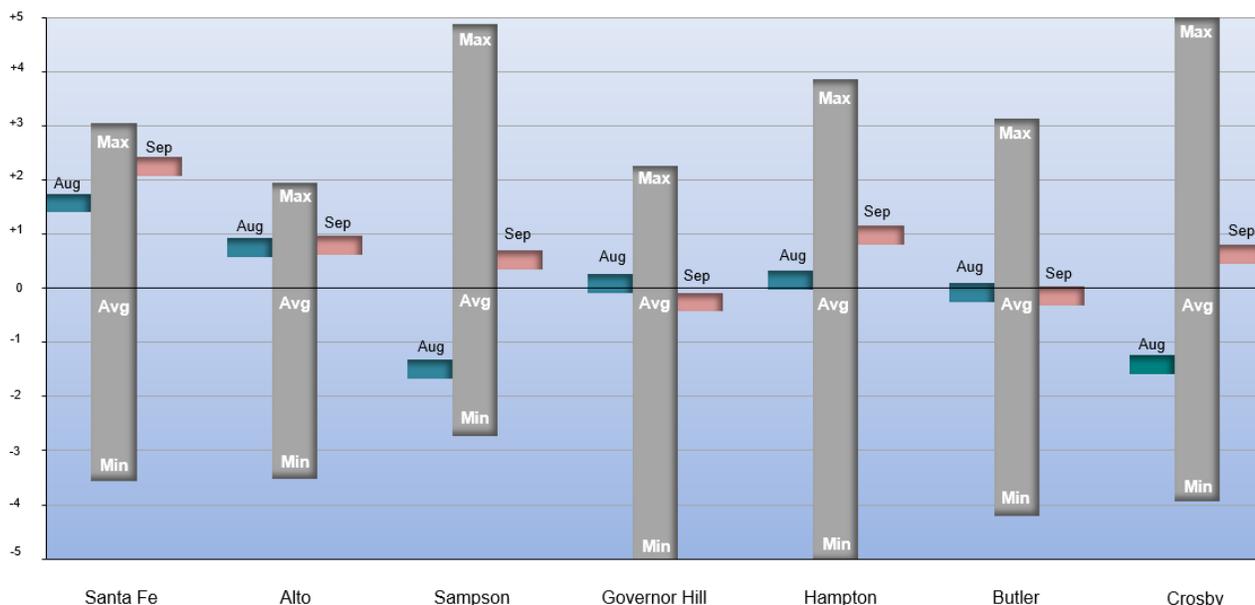


Figure 8: Flow Over the Past 12 Months, Fanning Springs (cubic feet per second)

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

Period 12 Month 10/01/2021 to 10/01/2022

2021-22

Percentile statistics are calculated using data from 10/01/1930 to 09/30/2020

FANNING SPRINGS

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

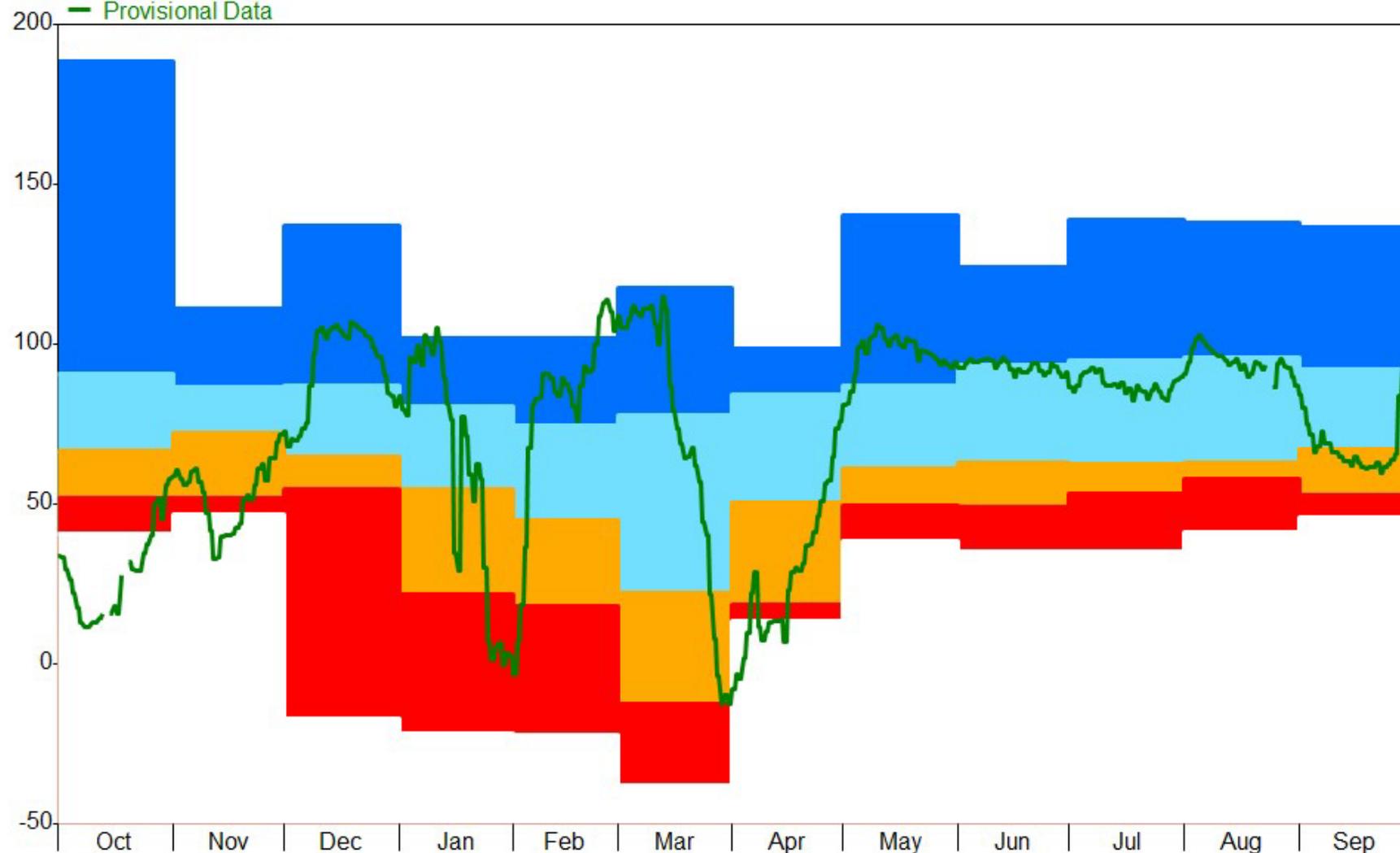


Figure 9: Flow Over the Past 12 Months, Manatee Springs (cubic feet per second)

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

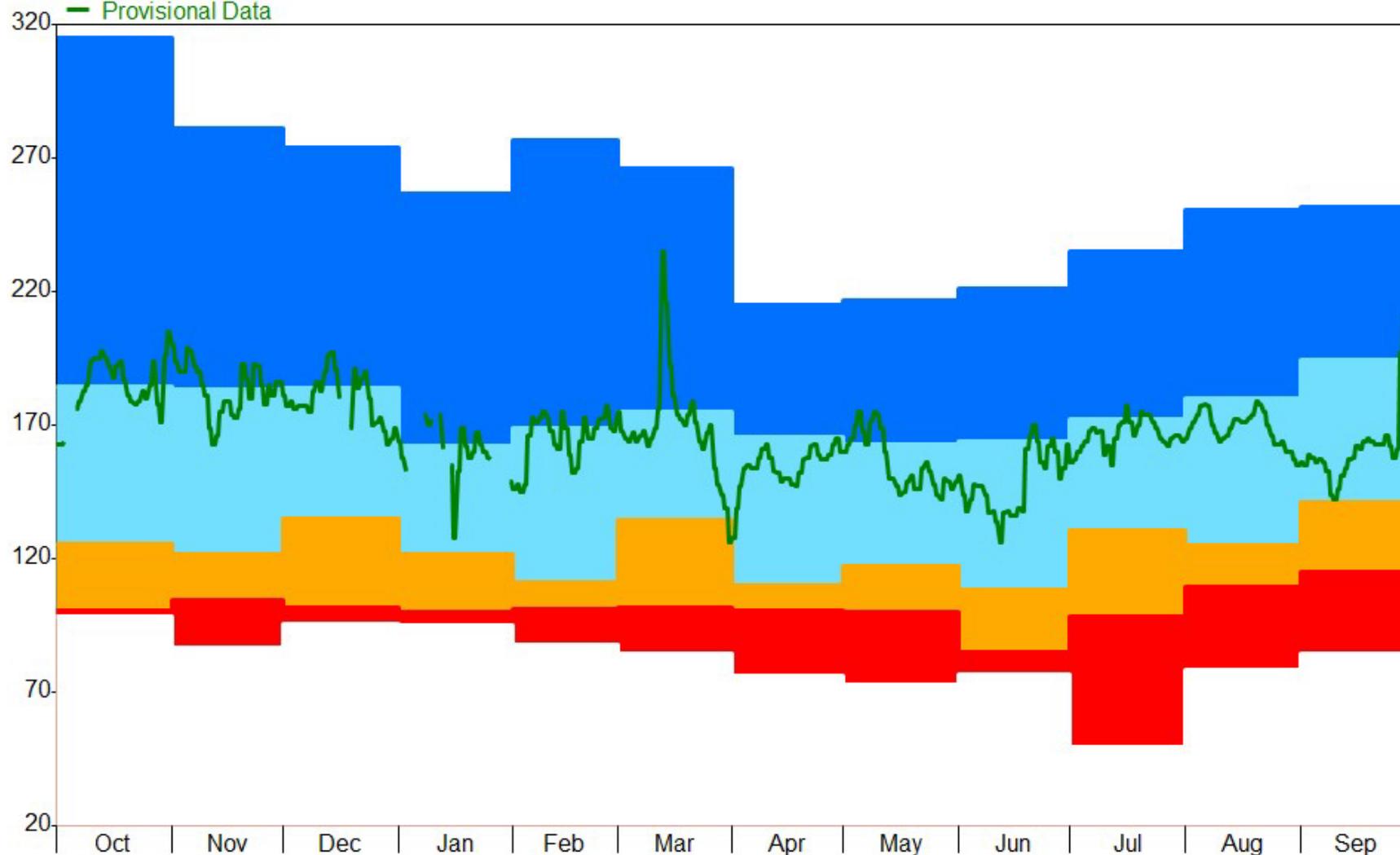
Period 12 Month 10/01/2021 to 10/01/2022

Percentile statistics are calculated using data from 03/01/1932 to 09/30/2020

2021-22

Manatee Springs

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



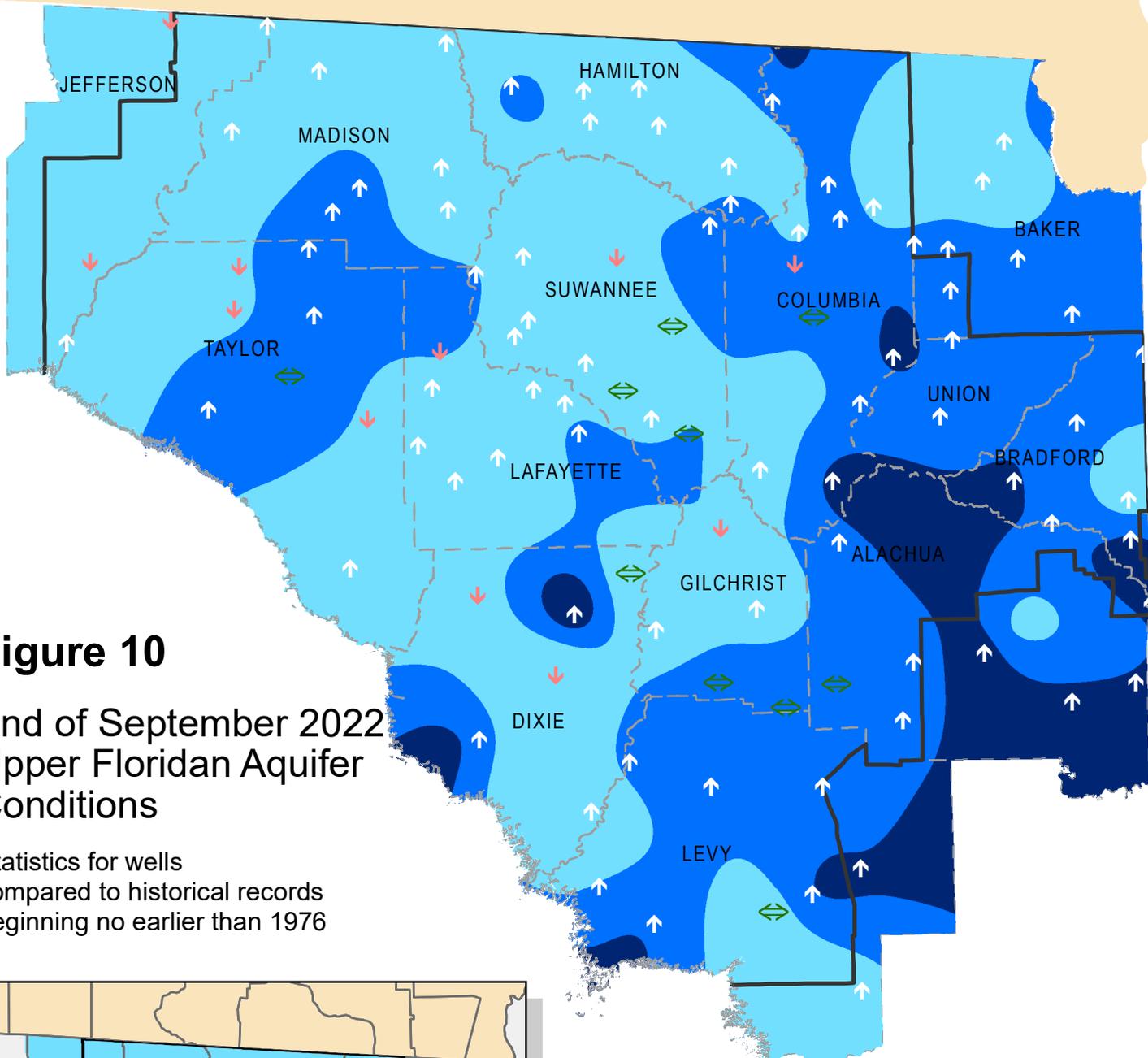
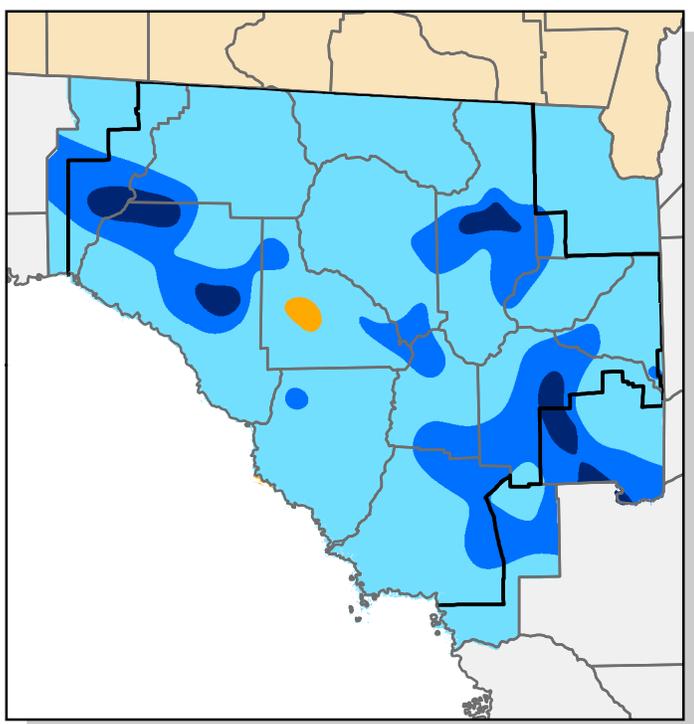


Figure 10

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

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



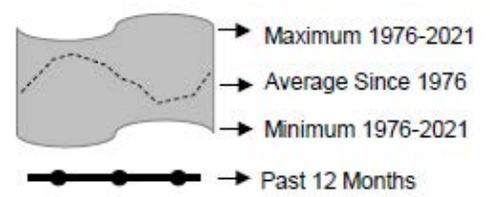
Inset: August Groundwater Percentiles

Additional wells courtesy of SJRWMD, SWFWMD and USGS

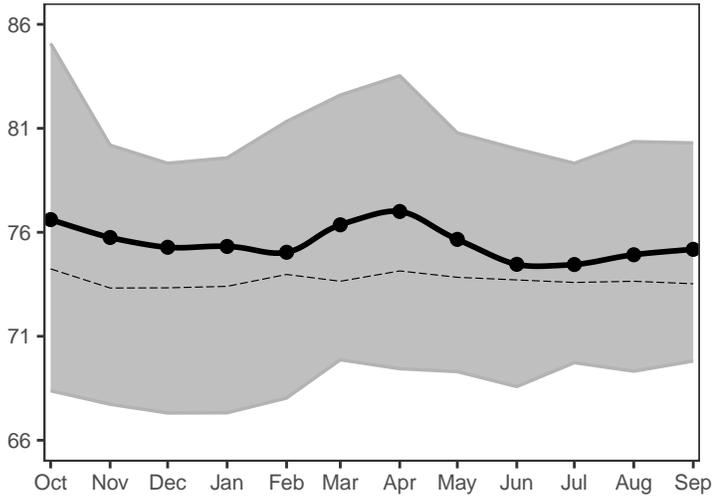
-  Extremely High
(Greater than 90th Percentile)
-  High
(75th to 90th Percentile)
-  Normal
(25th to 75th Percentile)
-  Low
(10th to 25th Percentile)
-  Extremely Low
(Less than 10th Percentile)
-   Increase/decrease in level since last month
-  Increase/decrease since last month less than one percent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

Figure 11: Monthly Groundwater Statistics

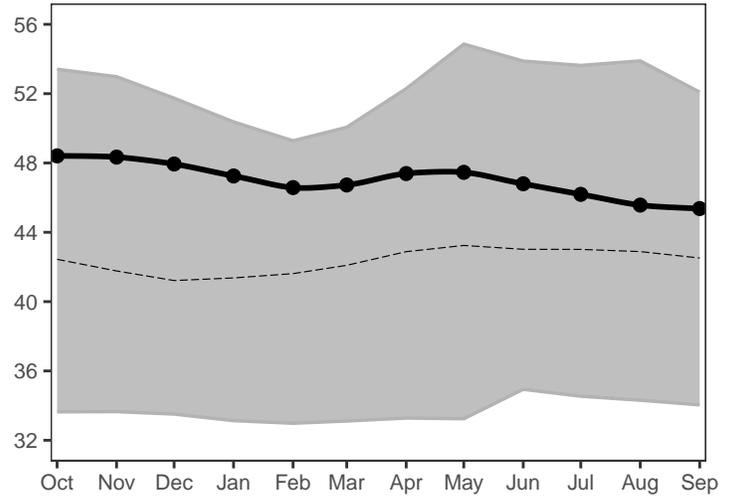
Levels October 2021 through September 2022
 Period of Record Beginning 1976



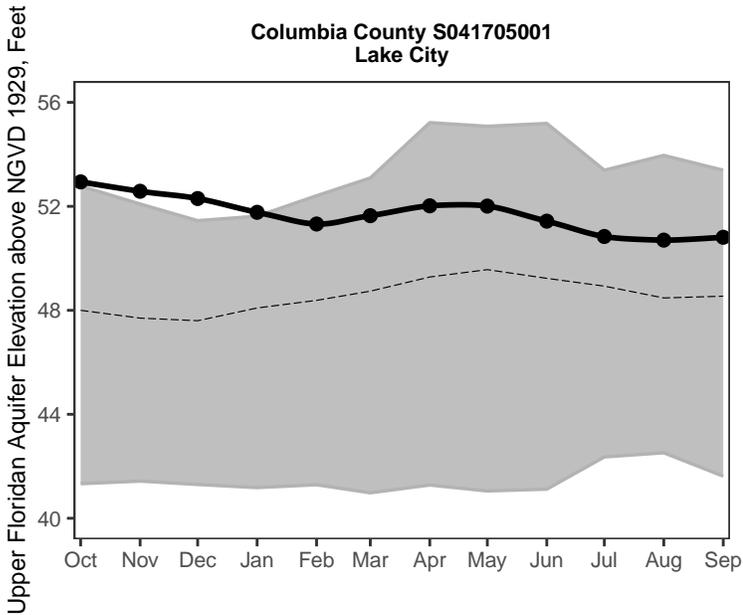
Madison County N010719001
near Greenville



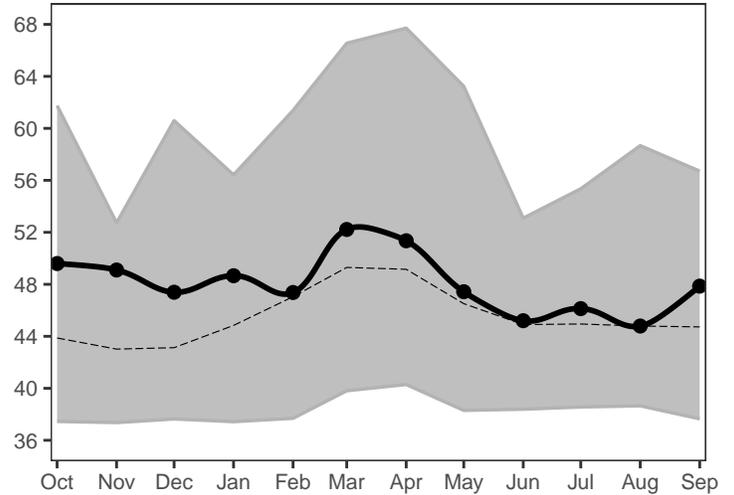
Suwannee County S021335001
near Live Oak



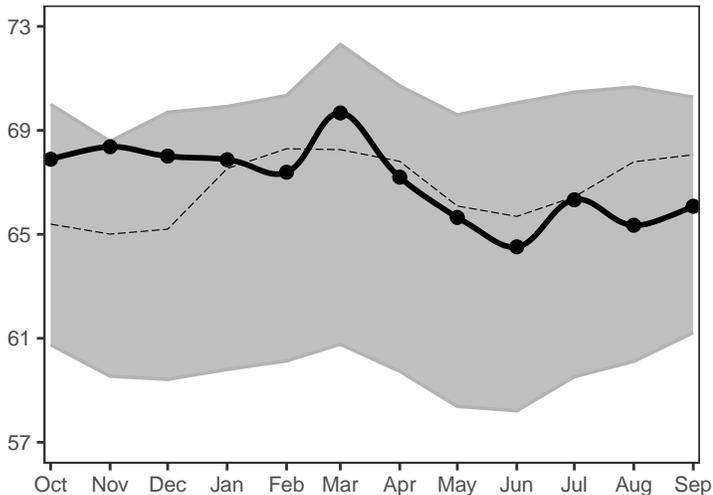
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S040736005
Perry

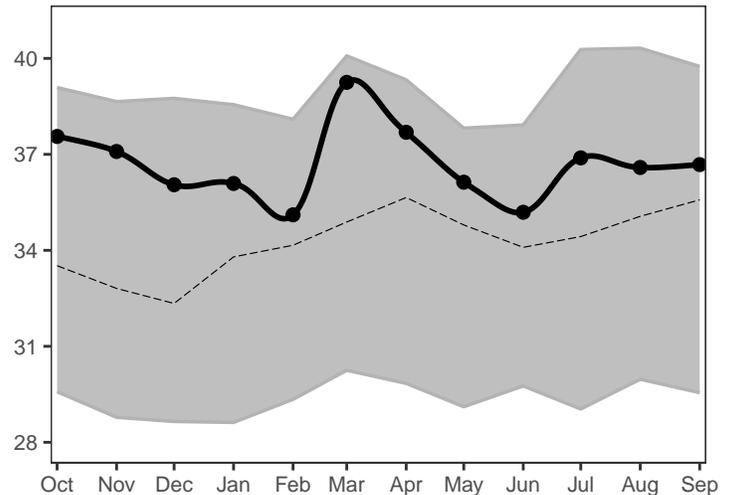
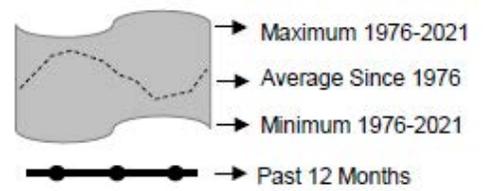
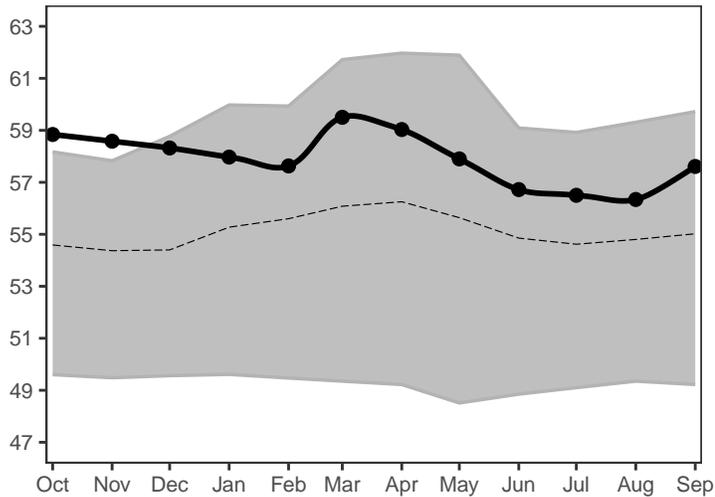


Figure 11, cont.: Monthly Groundwater Statistics

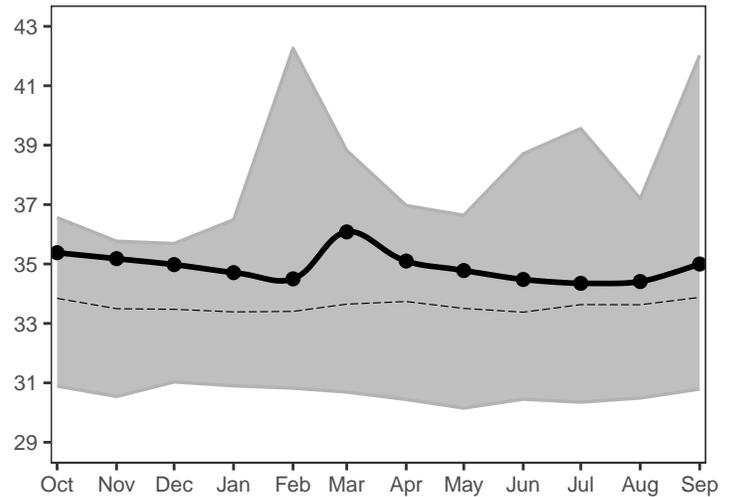
Levels October 2021 through September 2022
 Period of Record Beginning 1976



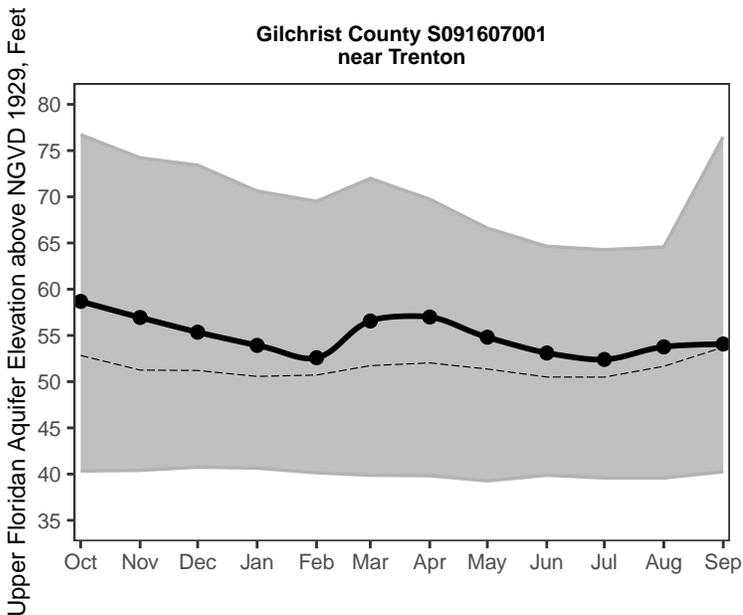
**Union County S051933001
 near Lake Butler**



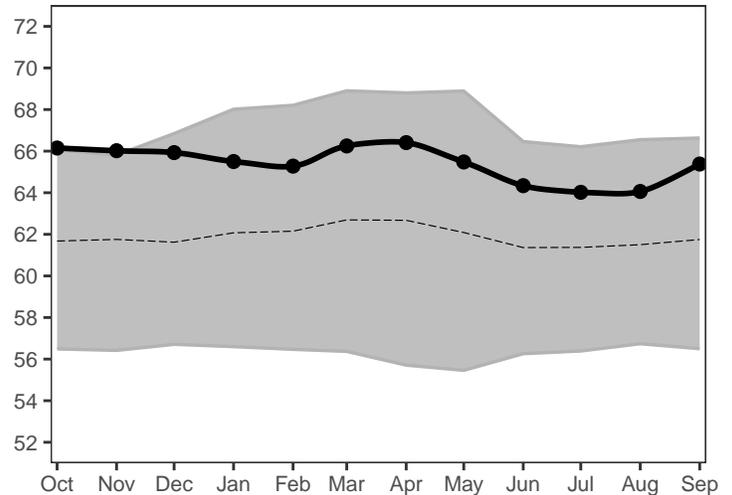
**Alachua County S081703001
 at High Springs**



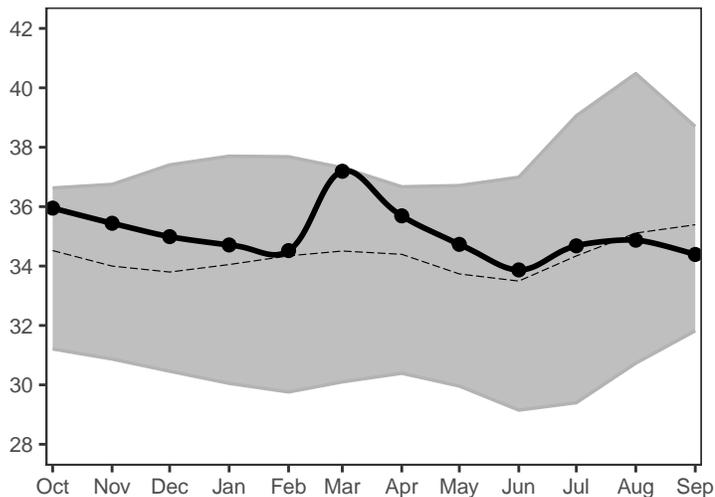
**Gilchrist County S091607001
 near Trenton**



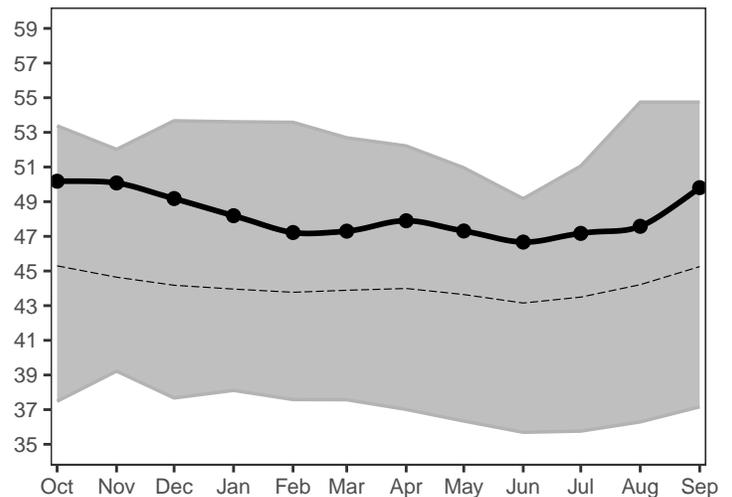
**Bradford County S072132001
 near Graham**

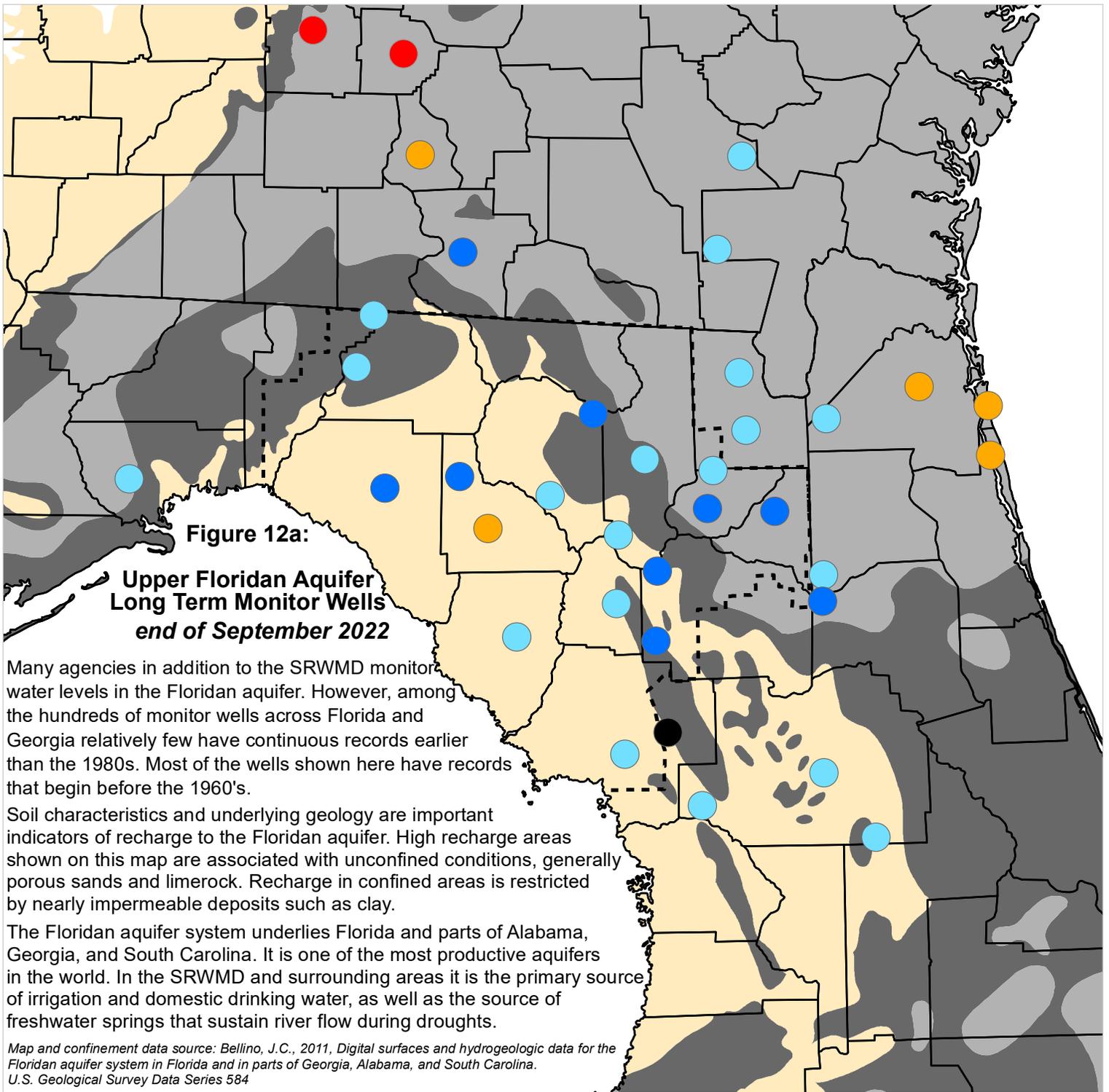


**Dixie County S101210001
 at Cross City**



**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 September 2022

