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: May 31, 2024

RE: May 2024 Hydrologic Conditions Report

## RAINFALL

- Districtwide average rainfall for the month was 4.57", which is about 32 percent higher than the 1932-2023 average of 3.47" (Table 1, Figure 1). The 12-month period ending May 31 reflected a Districtwide rainfall surplus of 7.69", which represented an increase to the 6.50" surplus seen at the end of April. Most District counties received anywhere between 2" and 7" of rainfall on average, with areas of Jefferson, Madison, Taylor, Hamilton, Dixie, and Lafayette counties receiving more than 7" of rainfall (Figure 2).

- Overall, a 12-month rainfall surplus was present for each basin except the Santa Fe Basin, which had a slight deficit of 1.5" by the end of May (Figure 3). Areas of twelve-month surpluses greater than 15" were represented in 3 of the basins, while portions with deficits of greater than 9" were also seen in 2 of the river basins. Most of the basins also had 3-month rainfall surpluses with the Santa Fe Basin showing a slight deficit by the end of the month (Figure 4). Areas of surpluses greater than 7 inches were prevalent in the northern part of the District, while portions with greater than 3-inch deficits were seen in the south over the past 3 months ending in May.

## SURFACE WATER

- **Rivers:** River gages except for the those on the Santa Fe River finished the month in the above normal ($75^{th}$ – $100^{th}$ percentile) flow range with several setting record high daily flows at some point in May (Figure 5). Other rivers throughout South Georgia and North Florida also finished the month in either the above normal or high (>$90^{th}$ percentile) flow categories (Figure 6) due to above average rainfall throughout May. The Santa Fe River near Ft. White, however, was the only gage to end May in the below normal ($10^{th}$ – $25^{th}$ percentile) range after starting out the month with normal flows.

- **Lakes**: Water levels decreased slightly at most of the monitored lakes in the District this month (Figure 7). The median decrease in stage across all measured lakes was around 0.2', with 7 of the lakes ending the month below their respective long-term average. Alligator Lake represented the largest water level decrease among lakes this month with a drop of about 0.7'.

- **Springs**: Flow measurements were made at 17 springs in May by the U.S. Geological Survey (USGS), District staff, and contractors. Fanning Springs began the month with very low flows but increased throughout May and ended with flows in the above normal range (Figure 8). Manatee Springs, however, spent much of the month in the normal category while peaking flow-wise in mid-May then decreasing. (Figure 9).

## GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District reflected mainly normal groundwater levels or higher in in May (Figure 10). However, some wells in Levy County showed levels this month in the low category. Overall, groundwater levels decreased by a median of 0.7' since the end of April and ended May with a Districtwide average around the 77$^{th}$ percentile.

Each index well was higher than its 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, or 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

A transition from El Niño to ENSO-neutral is likely next month with a 49% chance of a La Niña developing from June to August and a 69% chance from July to September 2024.

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

The U.S. Drought Monitor report released on June 4, 2024, shows no areas of the District with any drought characteristics.

## 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 | May 2024 | May Average* | Month % of Normal | Total Last 12 Months | Annual % of Normal* |
|---|---|---|---|---|---|
| Alachua | 2.67 | 3.57 | 75% | 53.18 | 101% |
| Baker | 3.48 | 3.51 | 99% | 57.81 | 110% |
| Bradford | 2.78 | 3.52 | 79% | 52.87 | 102% |
| Columbia | 3.58 | 3.59 | 100% | 57.03 | 108% |
| Dixie | 4.17 | 3.12 | 134% | 61.20 | 105% |
| Gilchrist | 3.63 | 3.41 | 106% | 55.71 | 102% |
| Hamilton | 5.18 | 3.38 | 153% | 65.49 | 126% |
| Jefferson | 7.41 | 3.61 | 205% | 67.18 | 120% |
| Lafayette | 4.91 | 3.41 | 144% | 66.06 | 120% |
| Levy | 2.71 | 3.10 | 87% | 56.30 | 100% |
| Madison | 6.74 | 3.32 | 203% | 72.64 | 136% |
| Suwannee | 4.24 | 3.33 | 127% | 63.93 | 120% |
| Taylor | 5.98 | 3.40 | 176% | 69.13 | 122% |
| Union | 3.08 | 3.55 | 87% | 54.99 | 104% |

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

| | |
|---|---|
| May 2024 District Average | 4.57 |
| May Long-Term Average (1932-2023) | 3.47 |
| Historical 12-month Average (1932-2023) | 54.71 |
| Past 12-Month Total | 62.40 |
| 12-Month Rainfall **Surplus**/Deficit | **7.69** |

**Figure 1:** Comparison of District-wide Monthly Rainfall

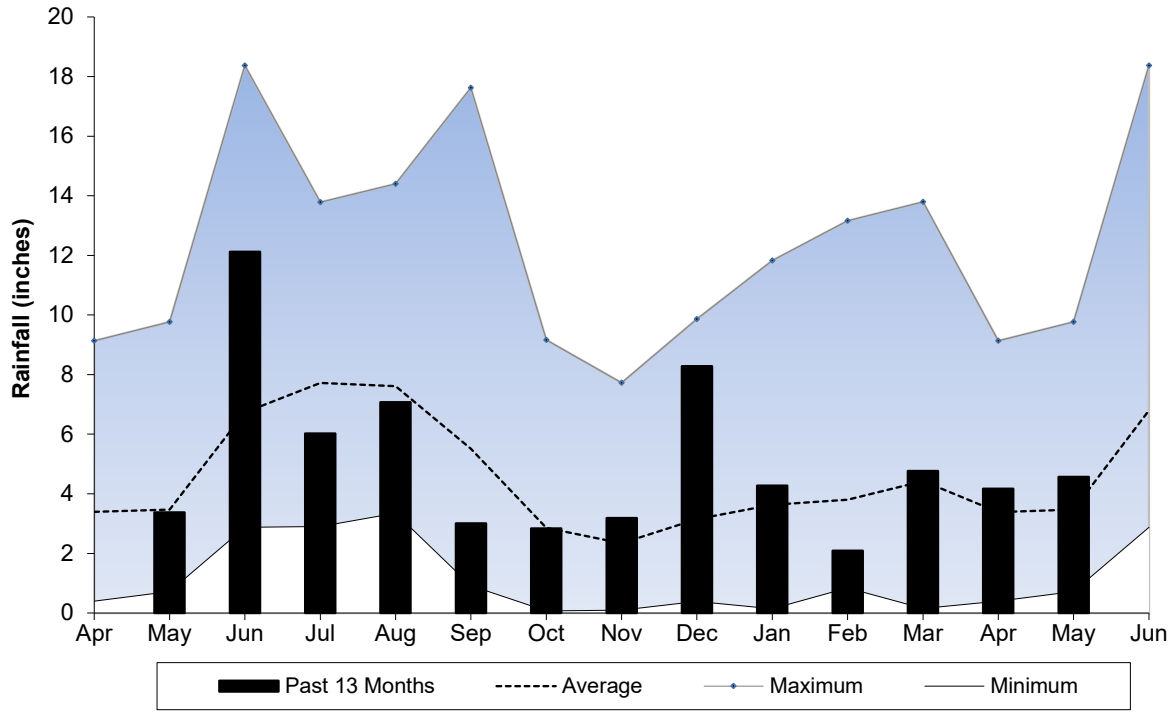


**Figure 2:** May 2024 SRWMD Gage-adjusted Radar Rainfall

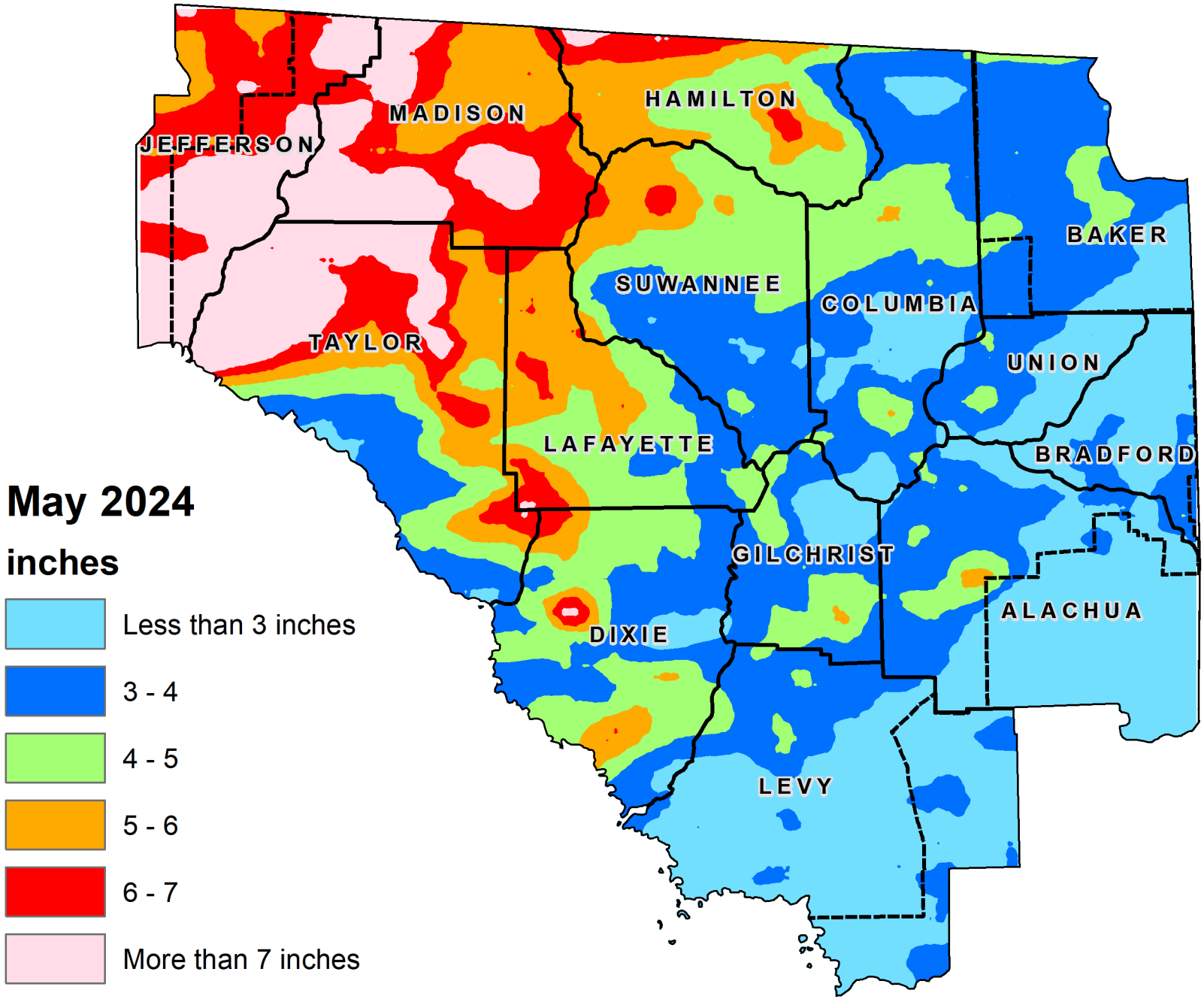
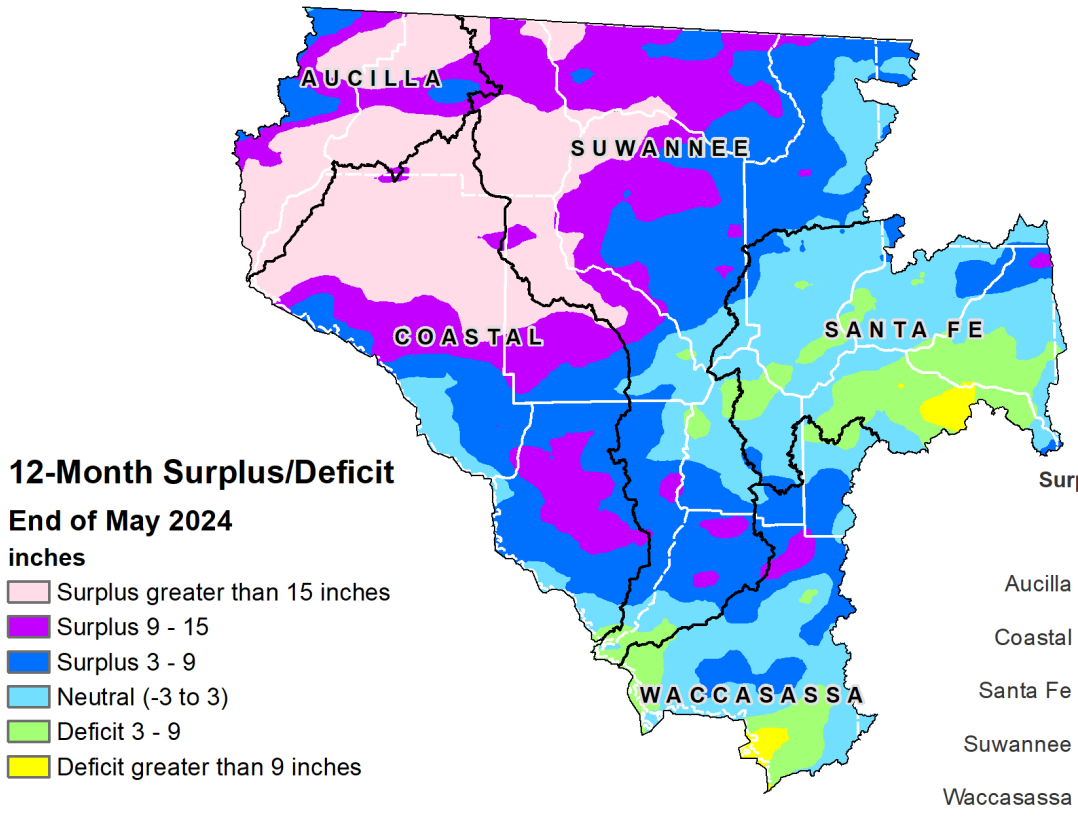


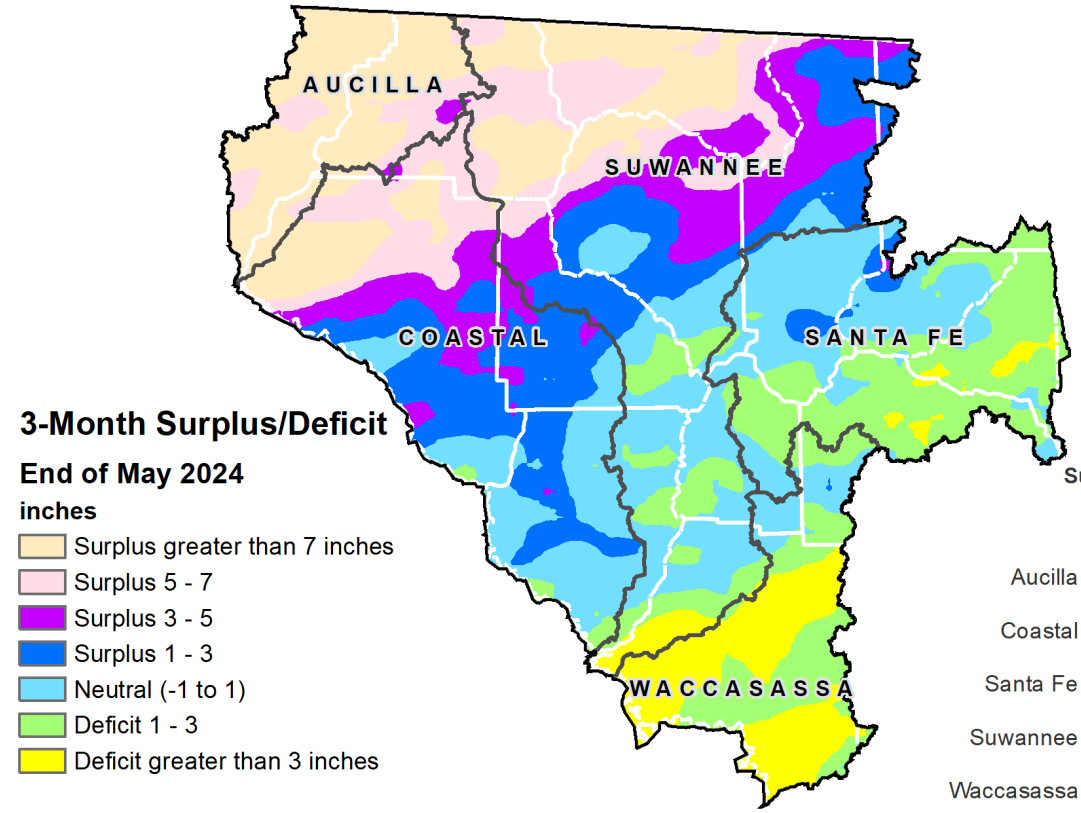
**Figure 3:** 12 - Month Rainfall Surplus/Deficit by River Basin through May 31, 2024




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

| | May 2024 | Apr 2024 |
|---|---|---|
| Aucilla | **+16.5** | +12.0 |
| Coastal | **+11.9** | + 9.2 |
| Santa Fe | **- 1.5** | 0 |
| Suwannee | **+ 8.9** | + 7.7 |
| Waccasassa | **+ 1.5** | + 2.4 |

**Figure 4:** 3 - Month Rainfall Surplus/Deficit by River Basin through May 31, 2024

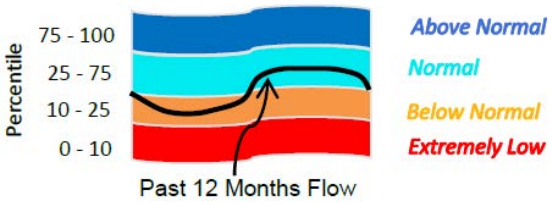


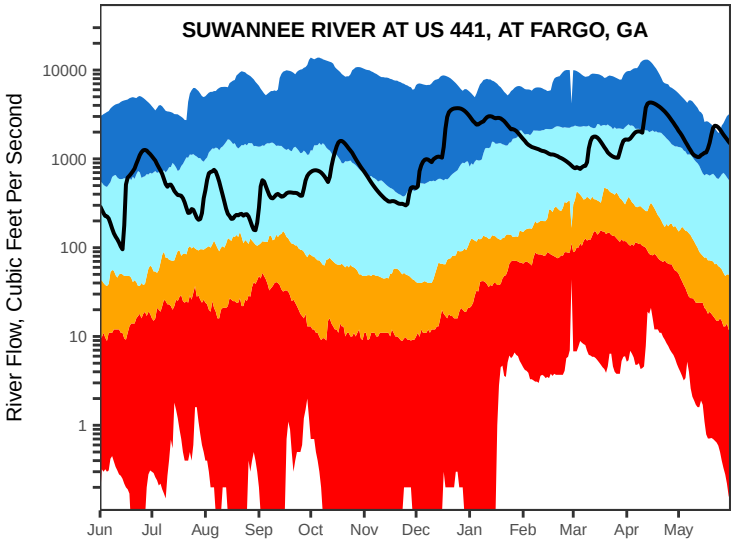

**3-Month Surplus (+) or Deficit (-) By Basin**

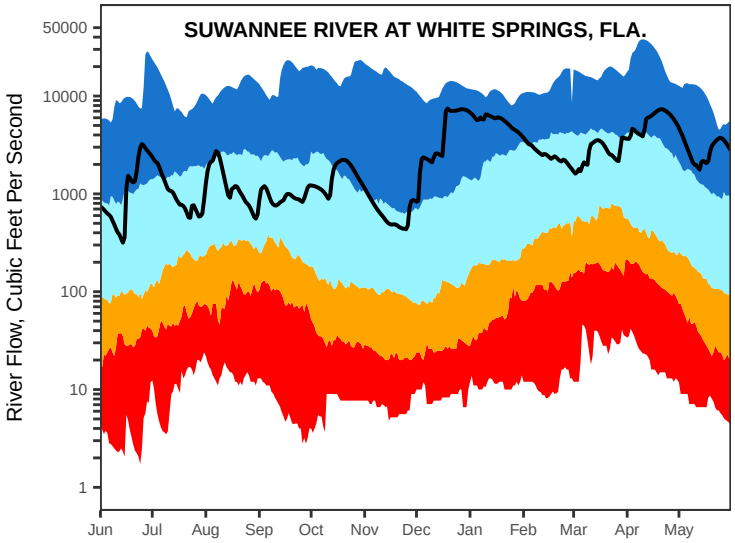
| | May 2024 | Apr 2024 |
|---|---|---|
| Aucilla | + 8.5 | + 2.2 |
| Coastal | + 3.1 | - 0.6 |
| Santa Fe | - 1.1 | - 2.4 |
| Suwannee | + 3.1 | + 0.5 |
| Waccasassa | - 2.9 | - 3.5 |

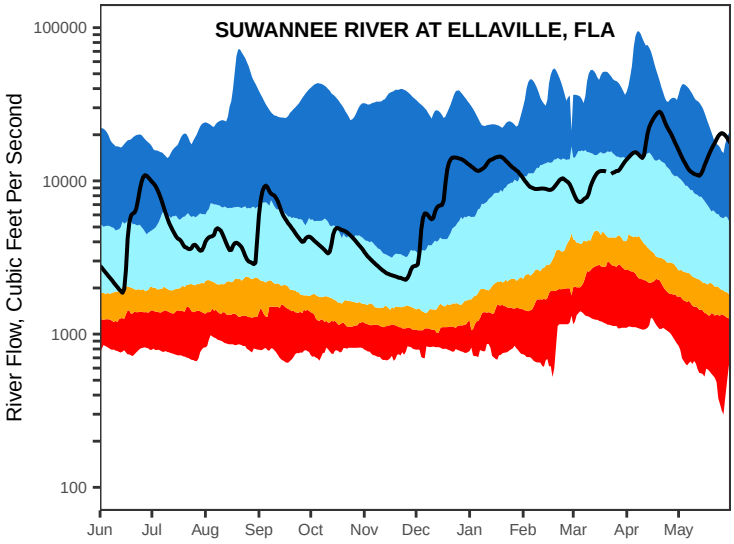
# **Figure 5:** Daily River Flow Statistics

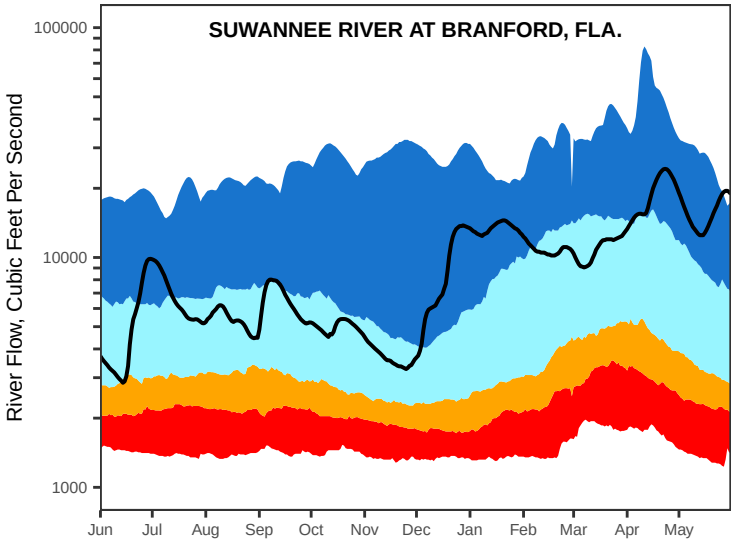
June 1, 2023 through May 31, 2024

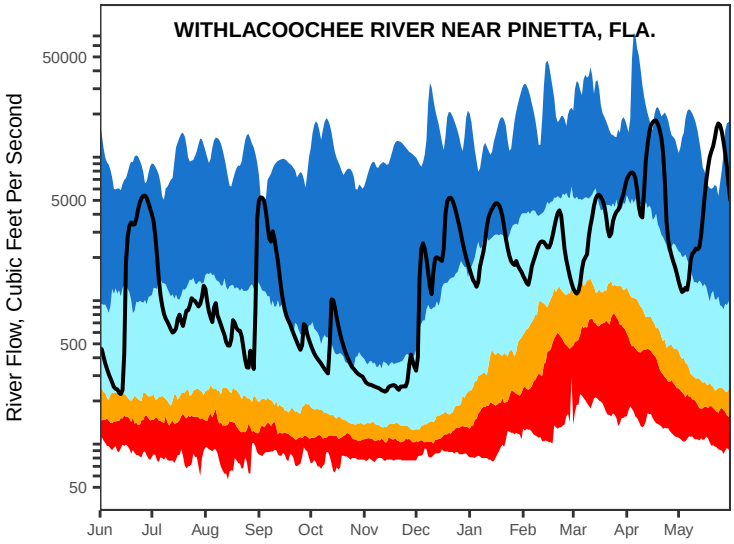


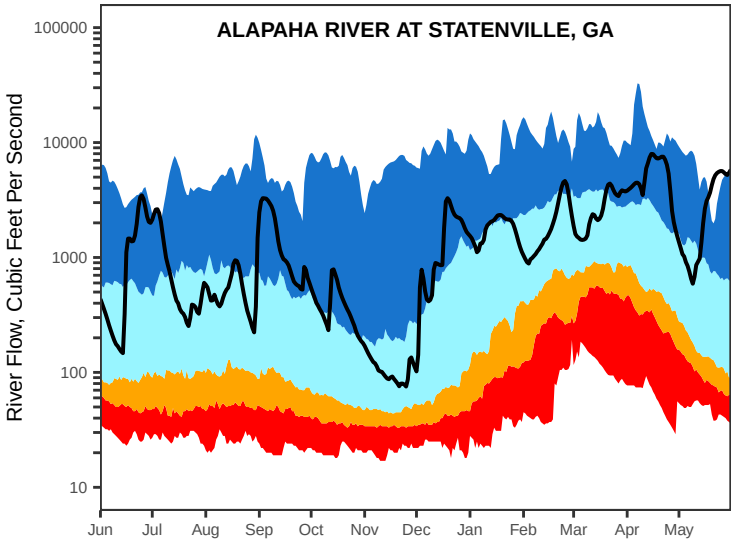



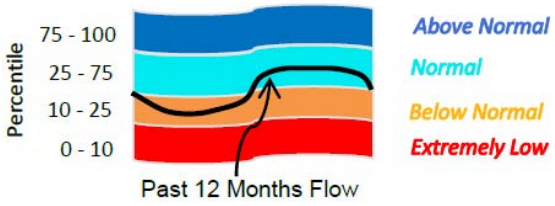



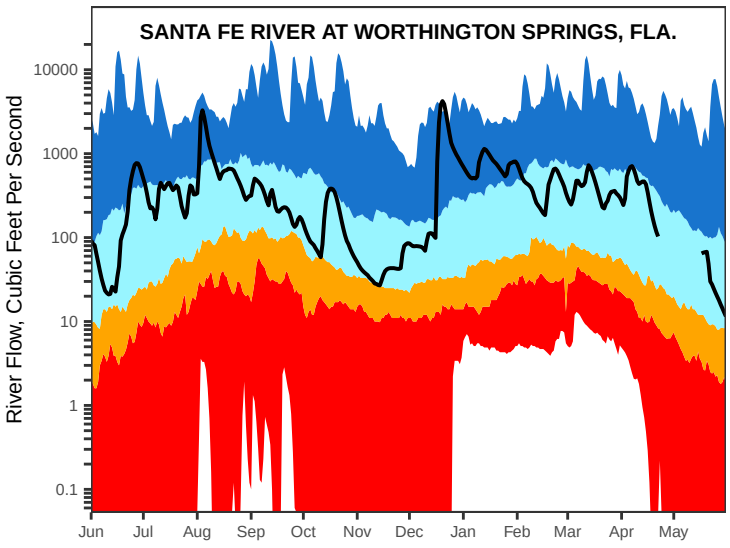



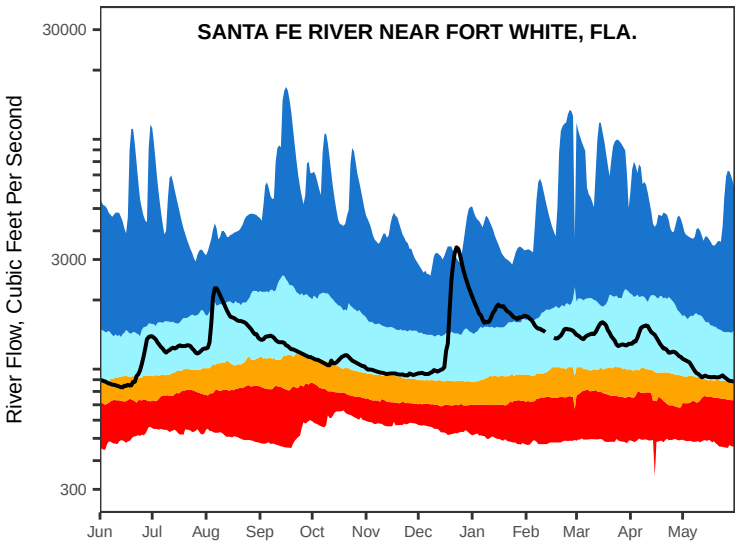



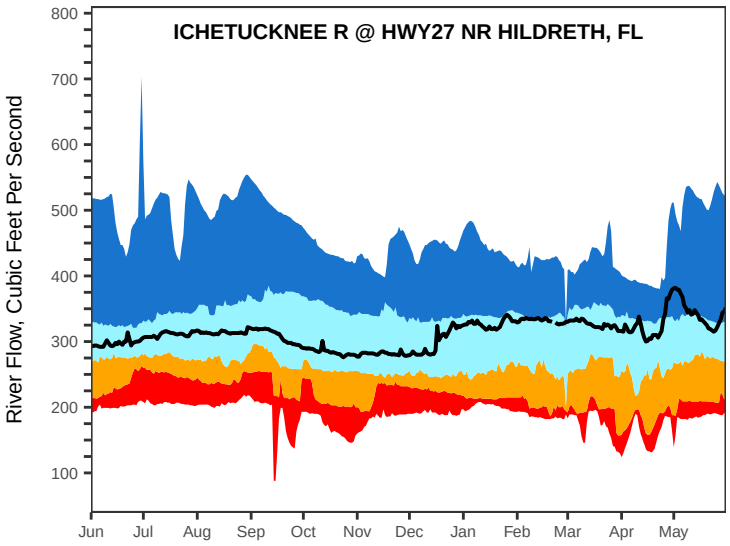
# **Figure 5, cont.:** Daily River Flow Statistics

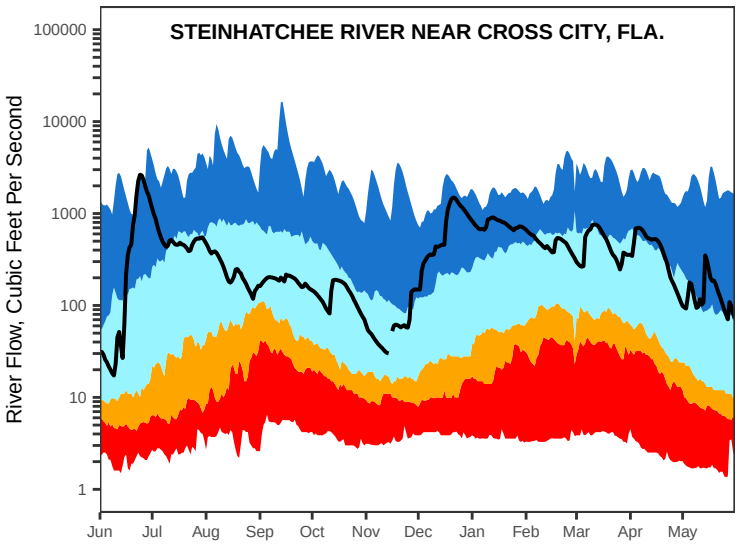
June 1, 2023 through May 31, 2024

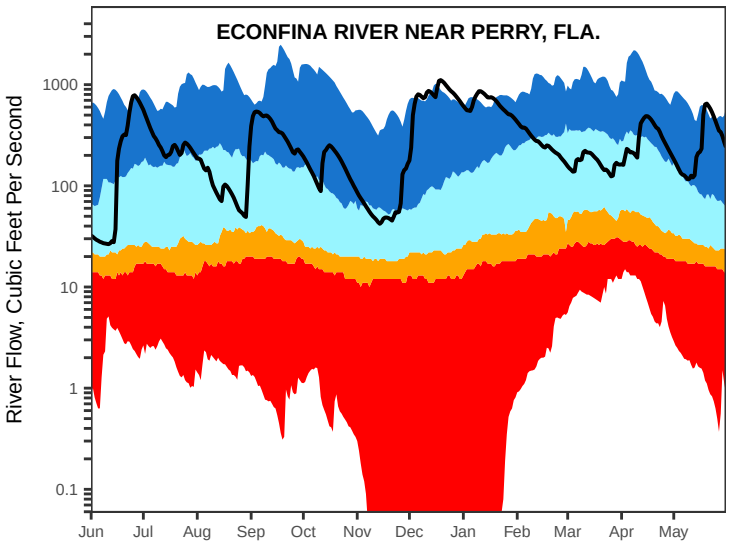


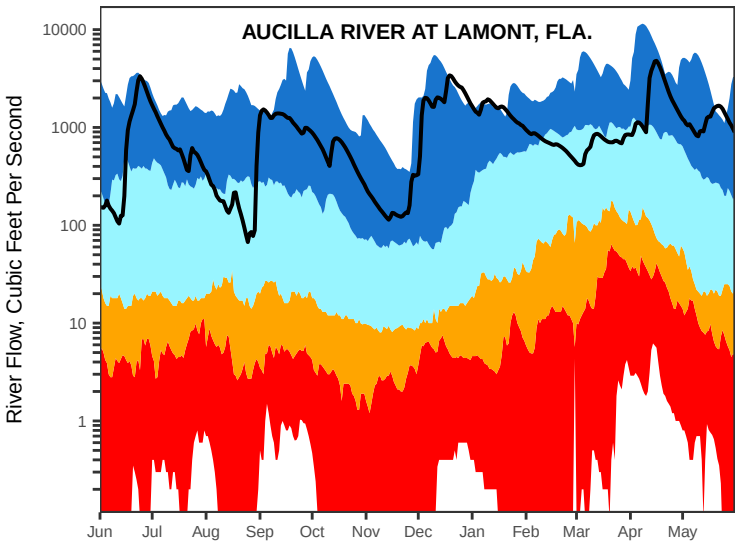
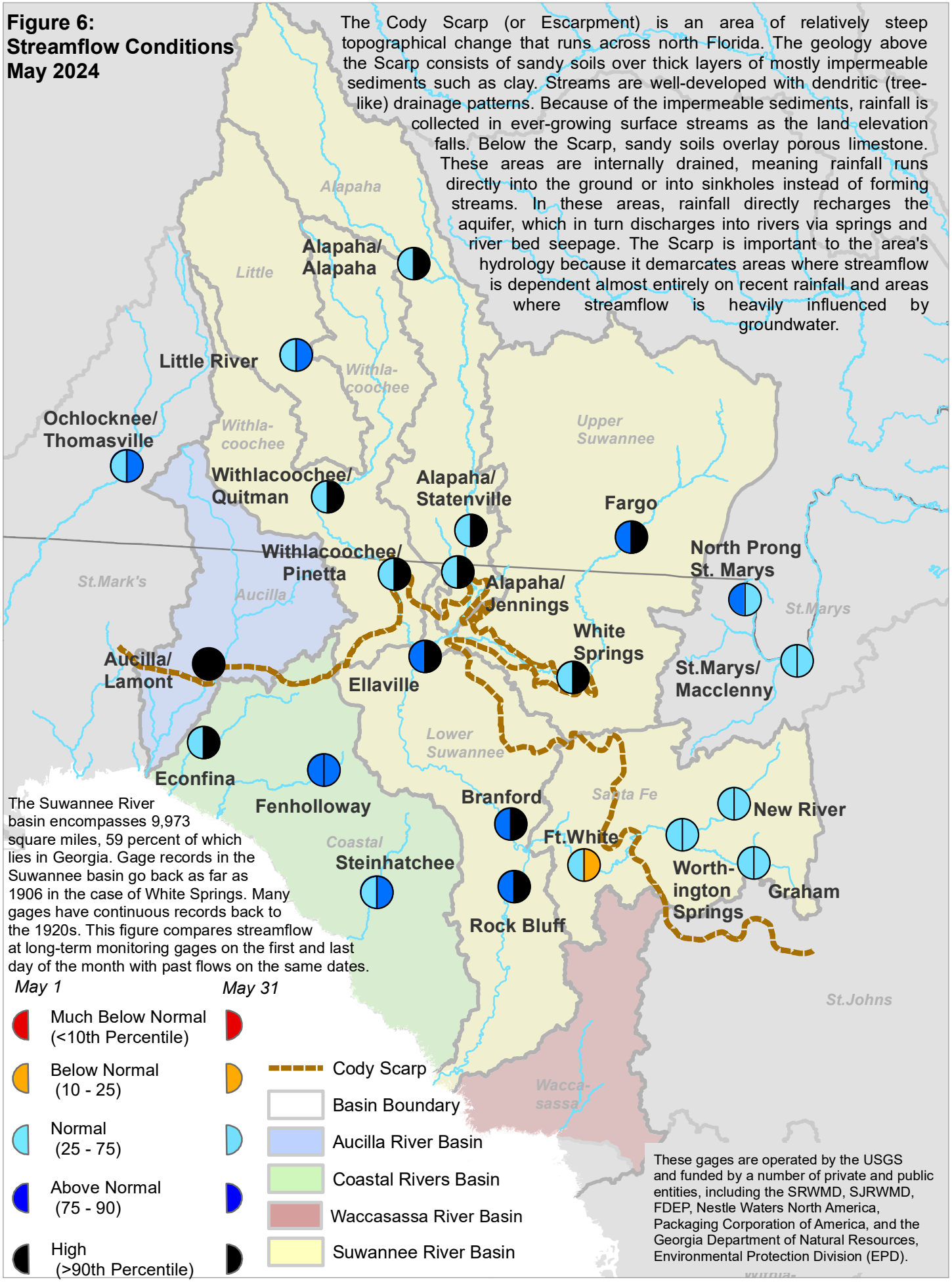



**Figure 6:**
**Streamflow Conditions**
**May 2024**

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.

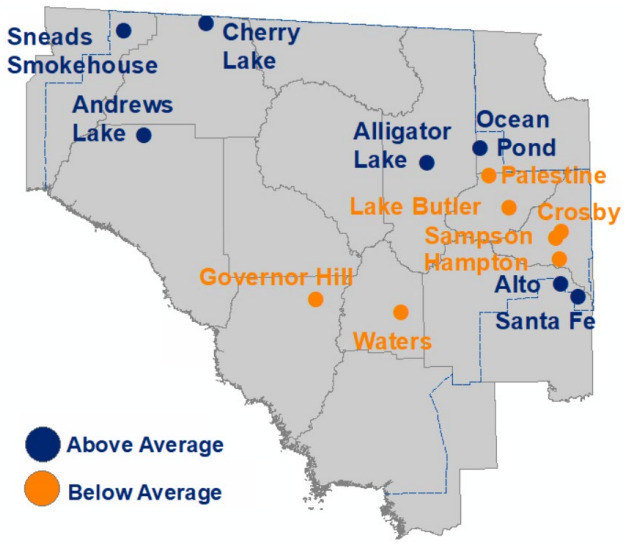



The Suwannee River basin encompasses 9,973 square miles, 59 percent of which lies in Georgia. Gage records in the Suwannee basin go back as far as 1906 in the case of White Springs. Many gages have continuous records back to the 1920s. This figure compares streamflow at long-term monitoring gages on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

| *May 1* | *May 31* | |
|---|---|---|
| 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**: May 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.

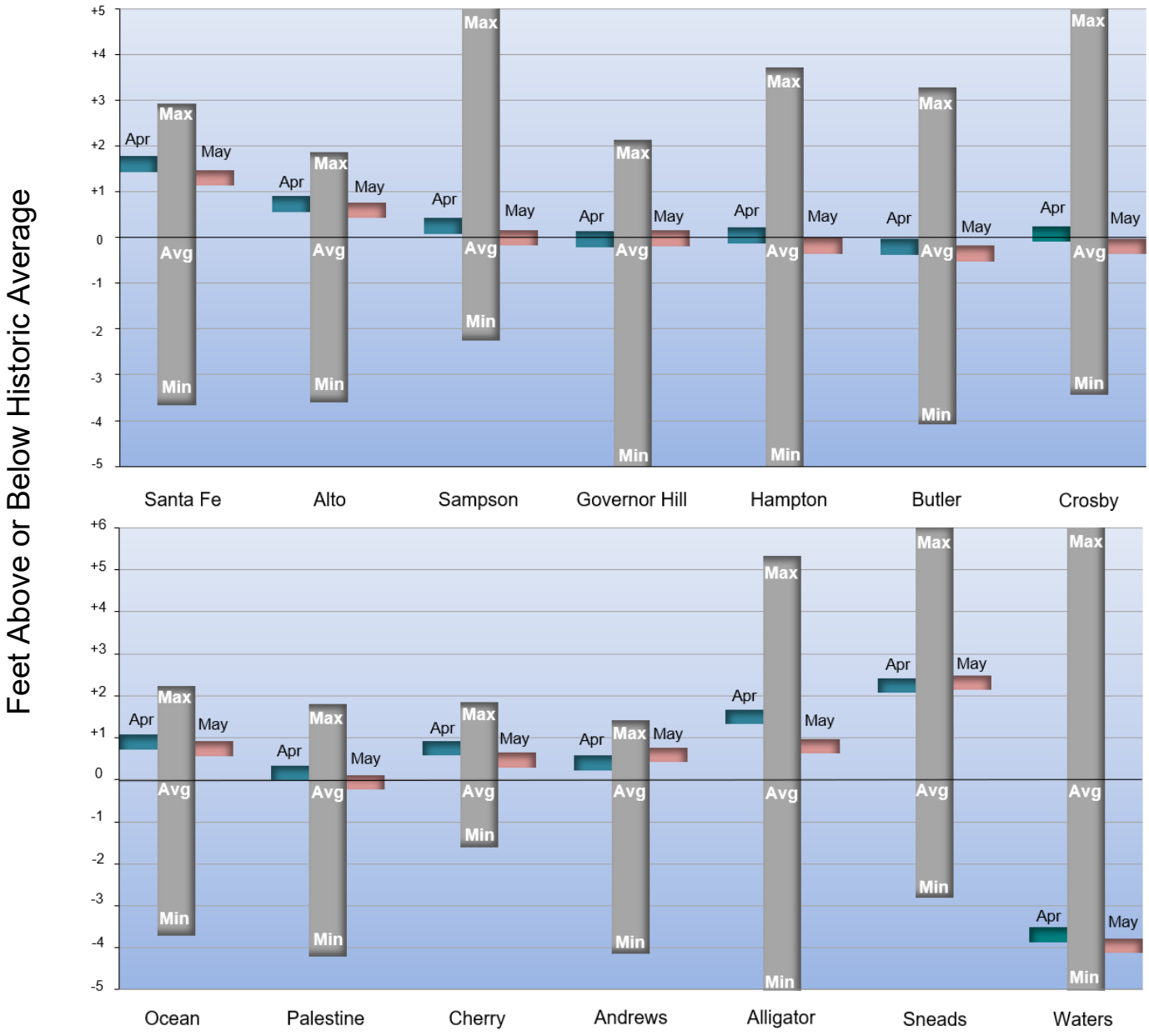


**Figure 8:** Flow Over the Past 12 Months, Fanning Springs (cubic feet per second)

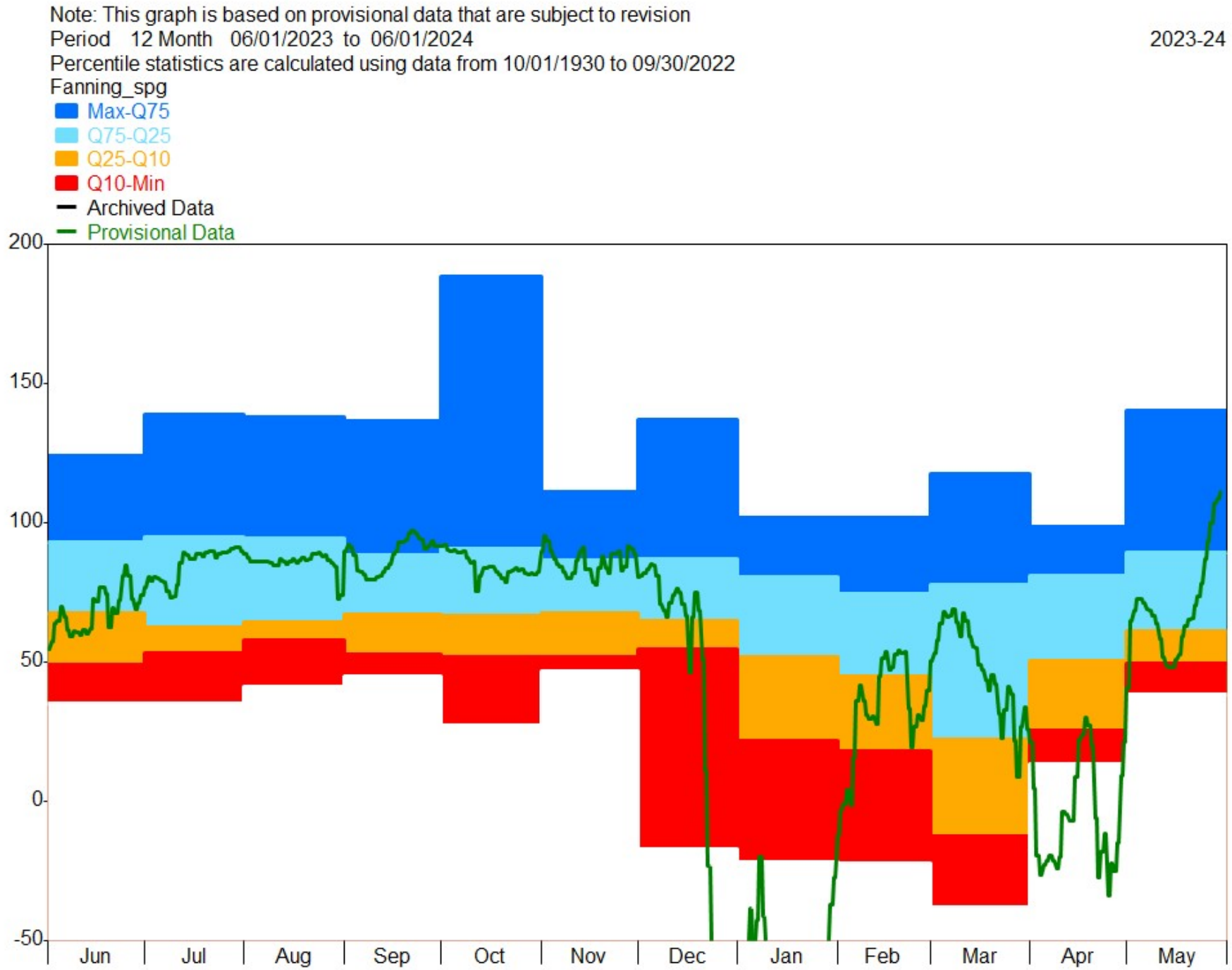
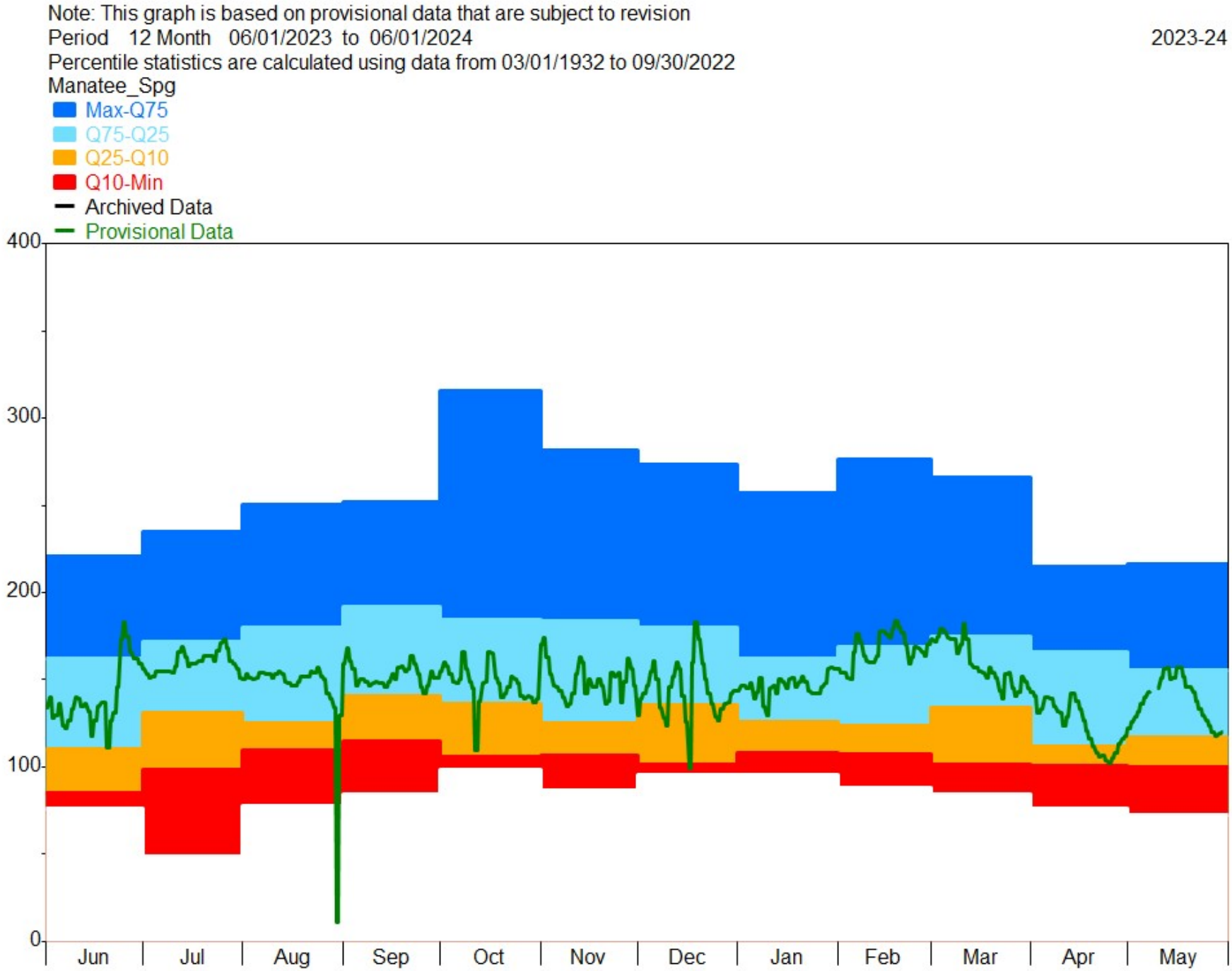
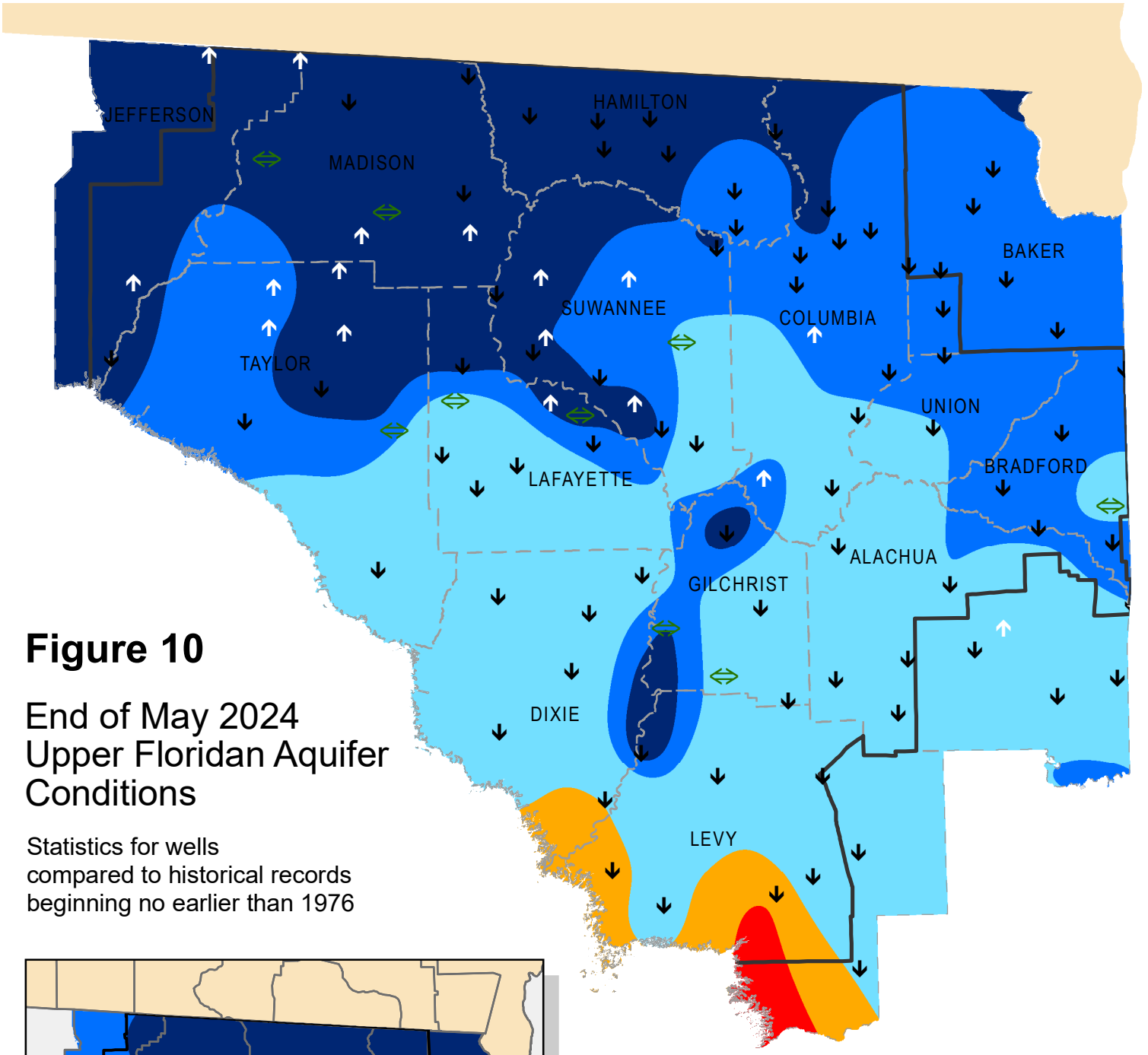


**Figure 9:** Flow Over the Past 12 Months, Manatee Springs (cubic feet per second)

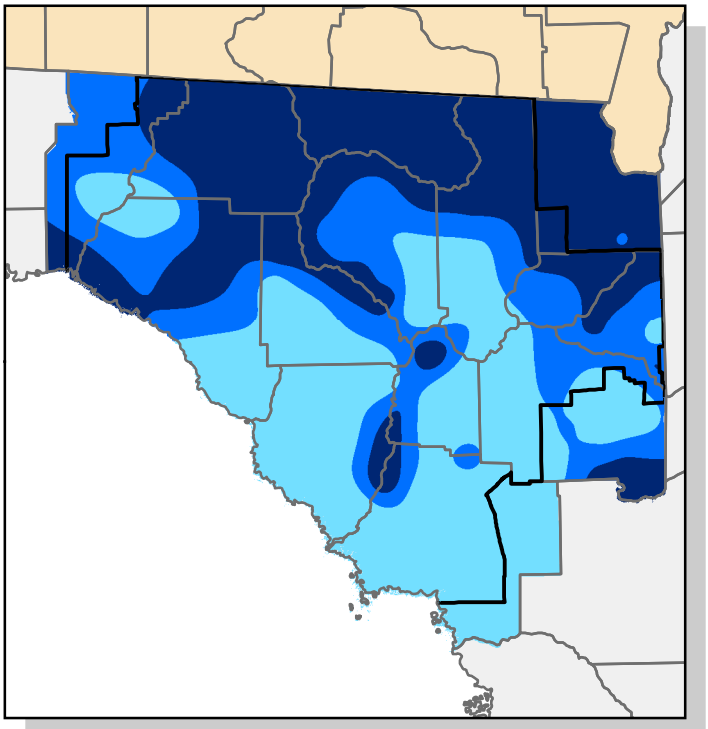





# Figure 10

## End of May 2024 Upper Floridan Aquifer Conditions

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



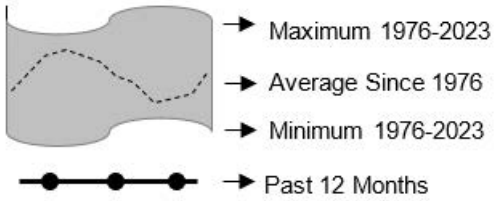
Inset: April Groundwater Percentiles

*Additional wells courtesy of SJRWMD, SWFWMD and USGS*

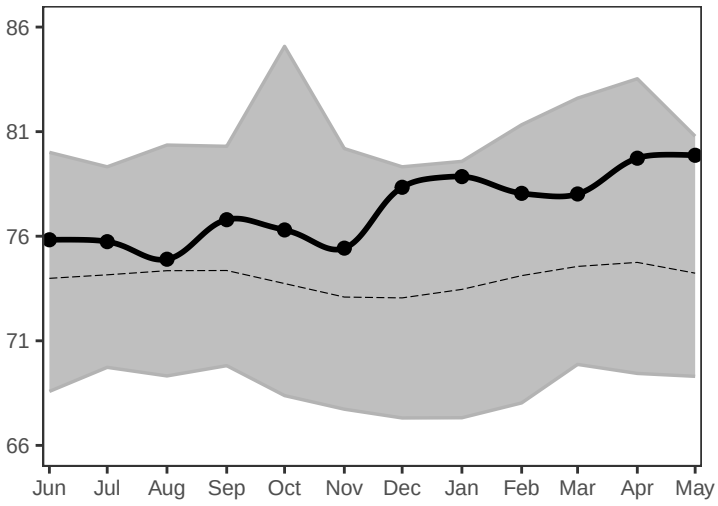
- Extremely High (Greater than 90th Percentile)
- High (75th to 90th Percentile)
- Normal (25th to 75th Percentile)
- Low (10th to 25th Percentile)
- Extremely Low (Less than 10th Percentile)
- Increase/decrease in level since last month
- Increase/decrease since last month less than one percent of historic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

# **Figure 11:** Monthly Groundwater Statistics

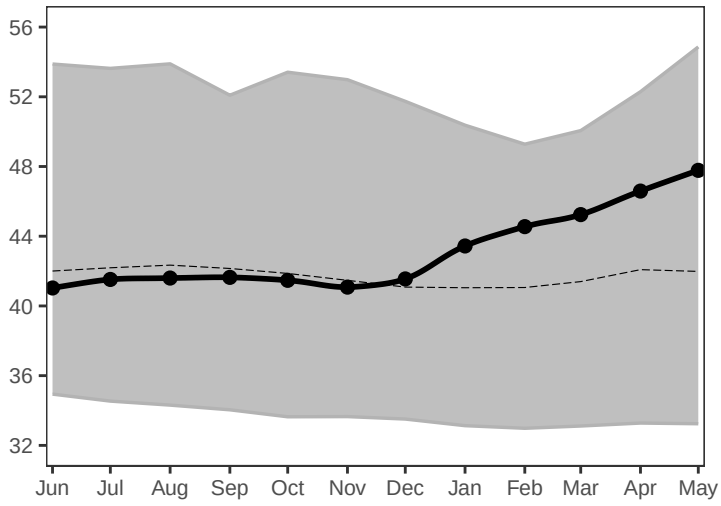
Levels June 2023 through May 2024
Period of Record Beginning 1976




**Madison County N010719001**
**near Greenville**

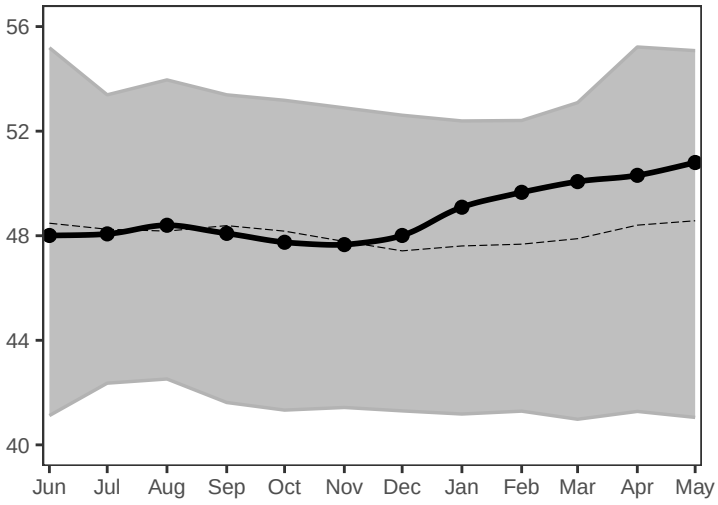



**Suwannee County S021335001**
**near Live Oak**

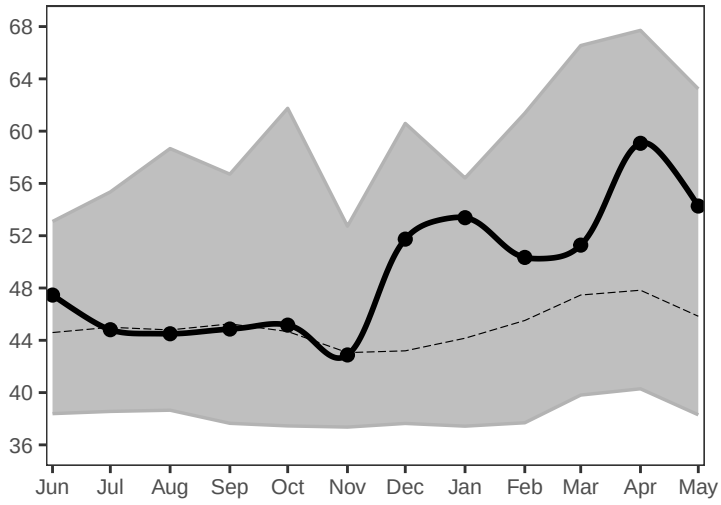



Upper Floridan Aquifer Elevation above NGVD 1929, Feet

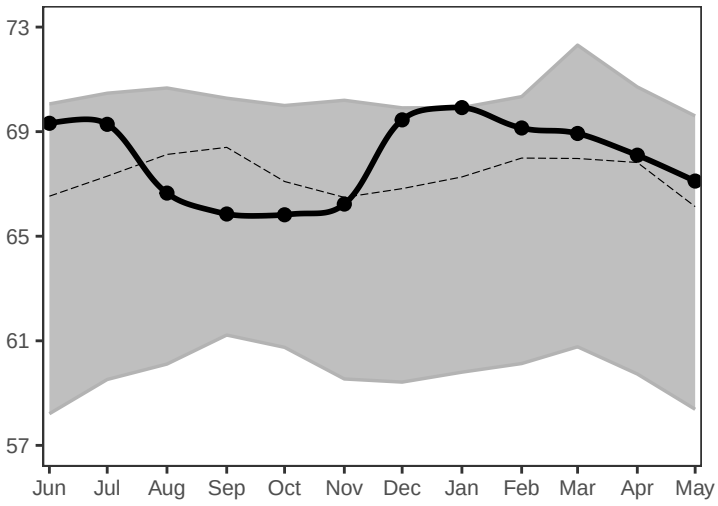
**Columbia County S041705001**
**Lake City**



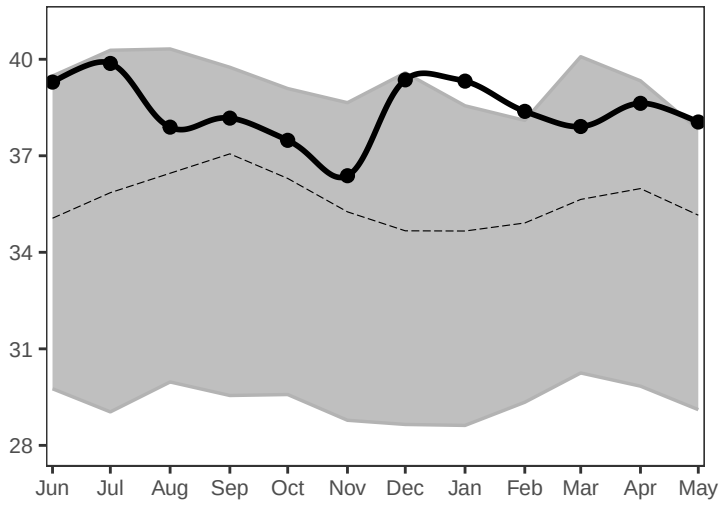

**Hamilton County N011422007**
**near Jasper**




**Lafayette County S061114001**
**near Mayo**

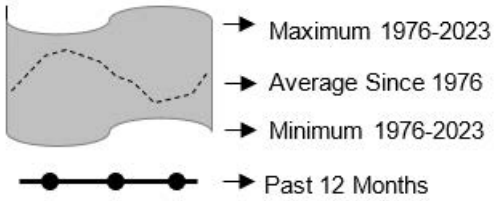



**Taylor County S040736005**
**Perry**

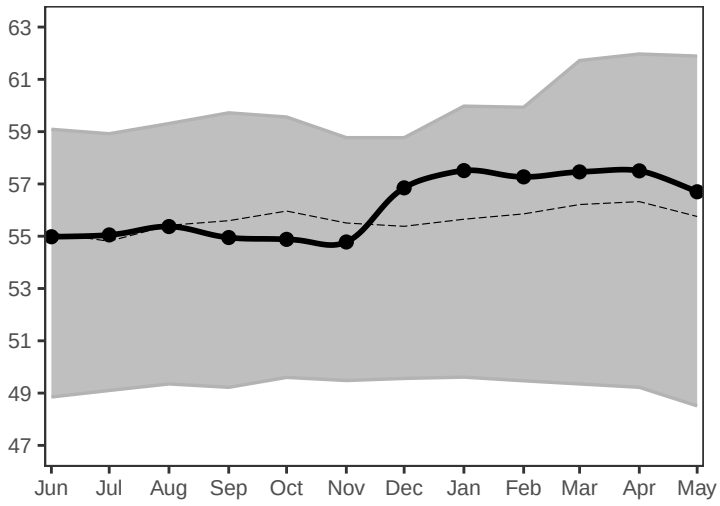


# **Figure 11, cont.:** Monthly Groundwater Statistics

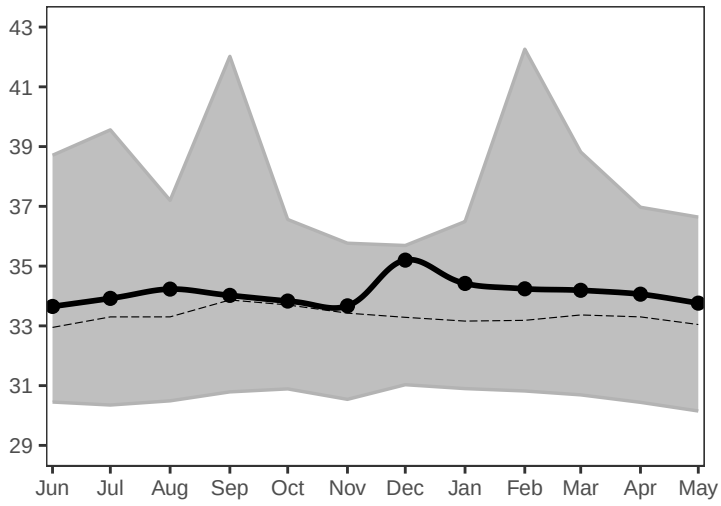
Levels June 2023 through May 2024
Period of Record Beginning 1976




**Union County S051933001**
**near Lake Butler**

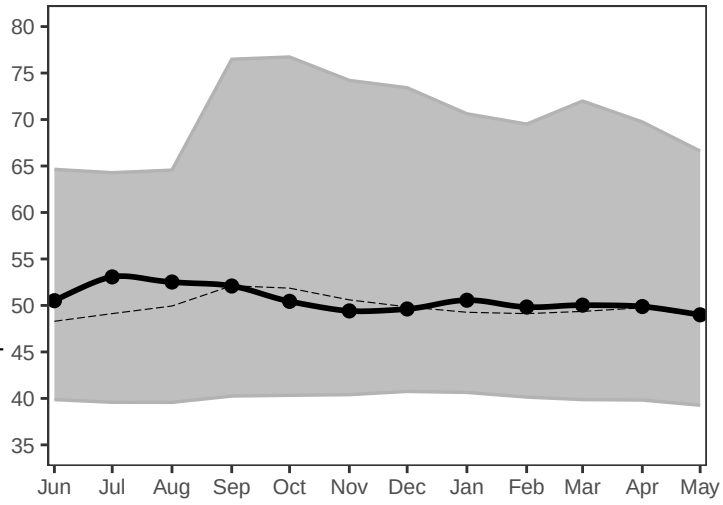



**Alachua County S081703001**
**at High Springs**

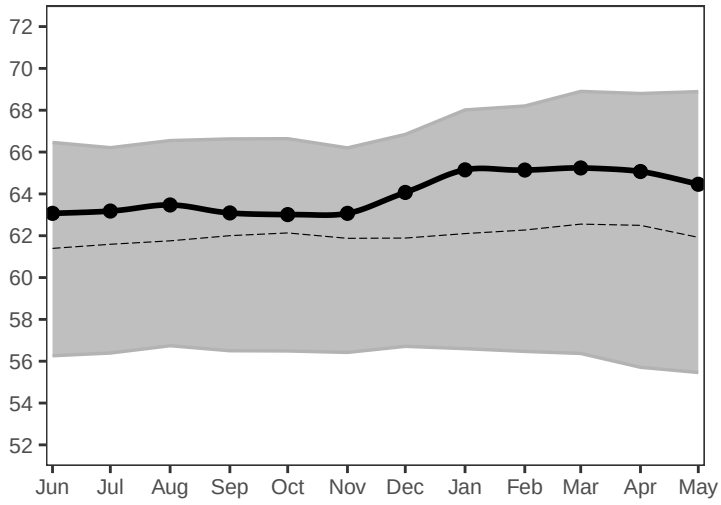



Upper Floridan Aquifer Elevation above NGVD 1929, Feet

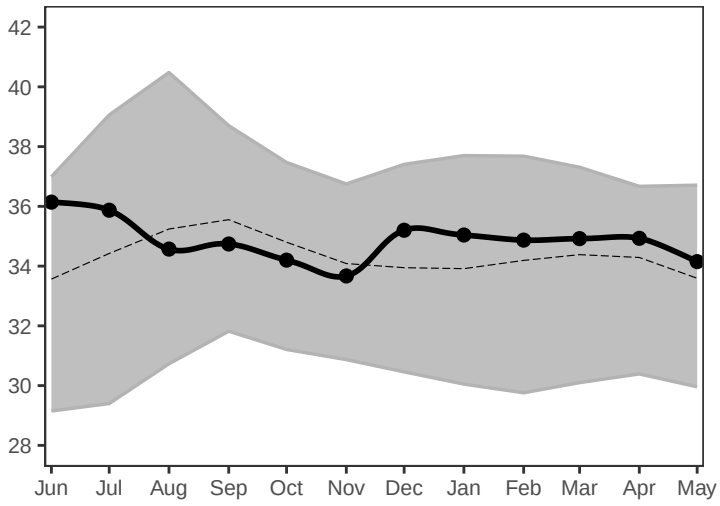
**Gilchrist County S091607001**
**near Trenton**



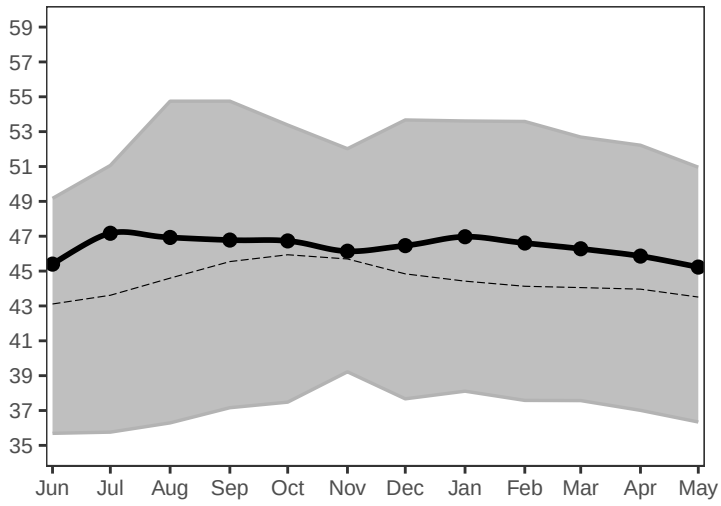

**Bradford County S072132001**
**near Graham**




**Dixie County S101210001**
**at Cross City**




**Levy County S131736001**
**near Bronson**



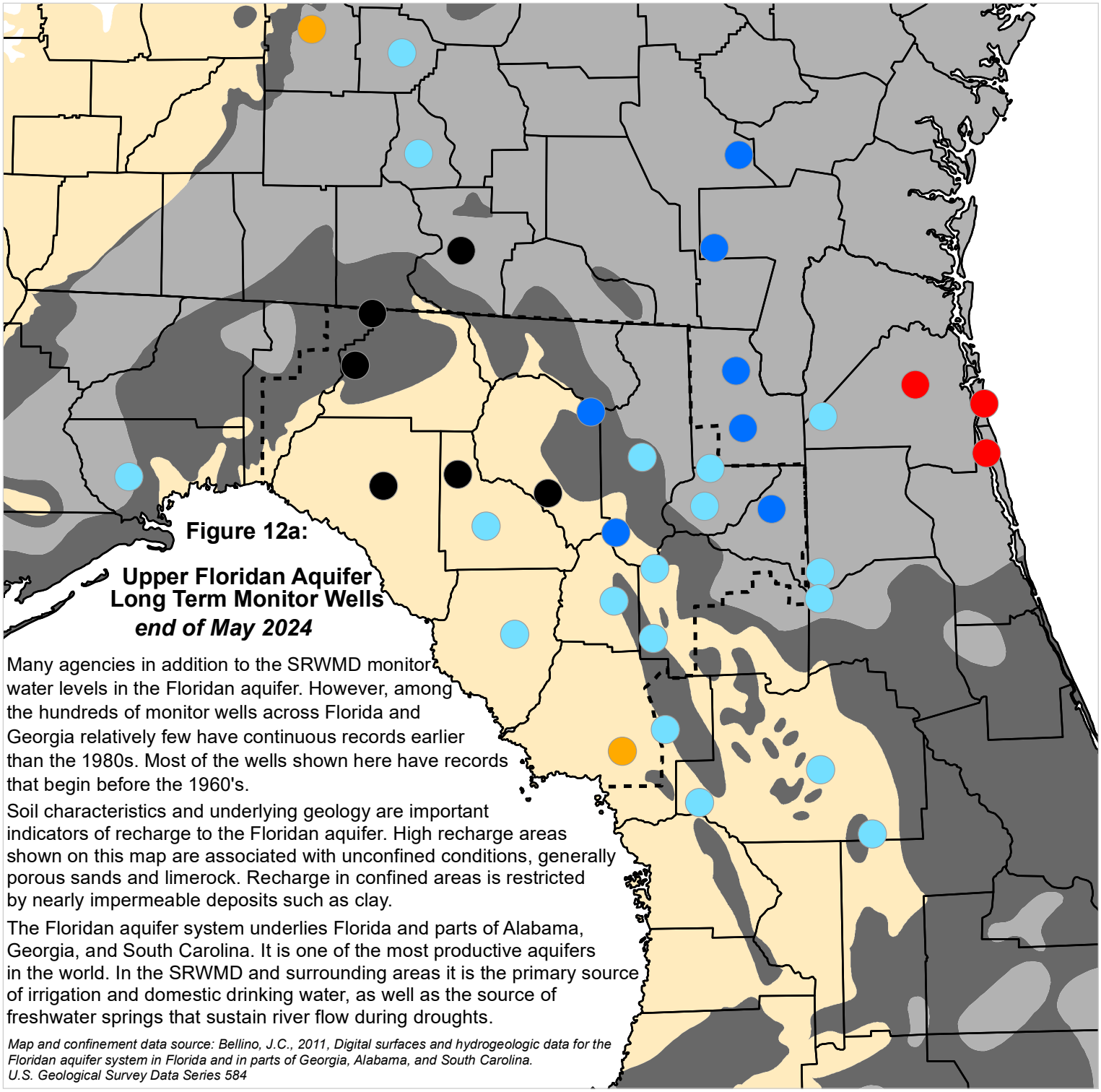


**Figure 12a:**

**Upper Floridan Aquifer**
**Long Term Monitor Wells**
***end of May 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**

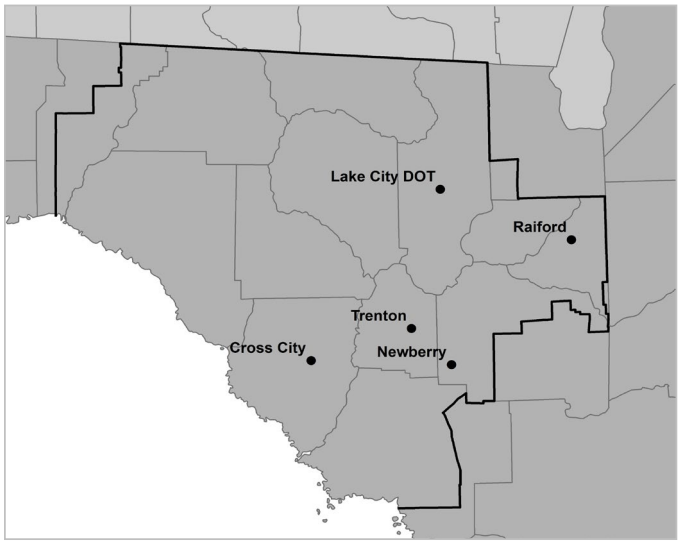
- Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
- Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
- Unconfined: Upper confining unit is absent or very thin. Recharge is high.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

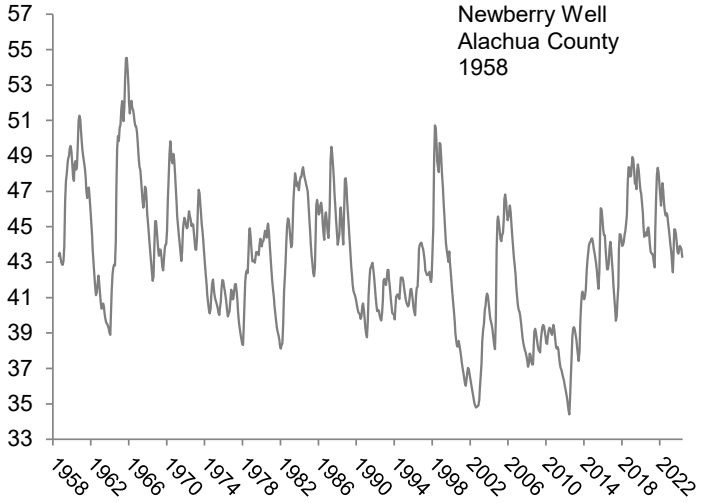
**Percentile of Most Recent Water Level Relative to Entire Record**

- 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 May 2024




Upper Floridan Aquifer Elevation above NGVD 1929, Feet