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: December 31, 2024

RE: December 2024 Hydrologic Conditions Report

RAINFALL

- Districtwide average rainfall for the month was 1.31", which was 59 percent lower than the 1932-2023 average of 3.20" (Table 1, Figure 1). The 12-month period ending December 31 reflected a Districtwide rainfall deficit of 1.89", which was a large decrease to the 5.08" surplus seen at the end of November. District counties received between 1 and 2" of rainfall on average, with parts of Taylor, Hamilton, and Levy counties receiving more than 2.5" of rainfall (Figure 2).

- Overall, a 12-month rainfall deficit was present for each basin, with most transitioning from a surplus to a deficit at the end of December (Figure 3). Areas of 12-month surpluses greater than 10" were represented in each basin except the Aucilla and Santa Fe, while deficits greater than 10" were observed in parts of the Waccasassa, Santa Fe, and Suwannee basins. Each of the river basins showed overall 3-month rainfall deficits, with both the Aucilla and Waccasassa basins transitioning from a surplus to a deficit by the end of December (Figure 4). Over the past 3 months, the Aucilla Basin showed portions with neutral conditions (1" of deficit to 1" of surplus), while areas with greater than 5" rainfall deficits were concentrated mainly in the Santa Fe, Suwannee, and Coastal basins.

SURFACE WATER

- **Rivers:** Each of the river gages in Figure 5 finished the month in the normal (25^{th} – 75^{th} percentile) flow range. Gages on the Withlacoochee, Aucilla, and Suwannee rivers trended in the above normal (75^{th} – 90^{th} percentile) flow range in early December due to some locally heavy rainfall during November. Other monitored river gages in South Georgia and North Florida also finished the month in the normal flow range, with both gages on the St. Mary's River (North Prong and Macclenny) in the below normal (10^{th} – 25^{th} percentile) flow percentile at the end of December (Figure 6).

- **Lakes**: Water levels decreased at each of the monitored lakes in the District this month (Figure 7). The median decrease in stage across all measured lakes was about 0.2', with 8 of the monitored lakes ending the month of December below their respective long-term average. Alligator Lake represented the largest water level decline among lakes this month with a stage decrease of 1.7'**.**

- **Springs**: Flow measurements were made at 12 springs in December by the U.S. Geological Survey (USGS), District staff, and contractors. Blue Hole Spring saw mainly below normal (10^{th} – 25^{th} percentile) flows during the past month (Figure 8). The Wacissa River, on the other hand, recorded flows in either the normal or above normal (75^{th} – 100^{th} percentile) ranges throughout the month (Figure 9).

GROUNDWATER

Upper Floridan Aquifer (UFA) levels across the District reflected normal (25th – 75th percentile), high (75th – 90th percentile), and extremely high (>90th percentile) levels this month (Figure 10). Overall, groundwater levels decreased by a median of 0.6' since the end of November and ended December with a Districtwide average around the 62nd percentile.

Each of the index wells remained higher than its respective historical monthly average level at the end of the month (Figure 11). Long-term District UFA well levels ended the December in the normal, high, or very high categories (Figure 12a). Monitored 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

La Niña conditions are currently present and are expected to remain through February-April 2025 (59% chance), with a 60% chance of a transition back to ENSO-neutral during March to May 2025.

The NOAA three-month seasonal outlook suggests above normal temperatures along with below normal precipitation throughout the District from January to March 2025.

The U.S. Drought Monitor report released on Thursday, January 9th, shows Moderate Drought (D1) conditions for most of the District. Parts of Jefferson, Madison, Taylor, and Hamilton counties have been designated as Abnormally Dry (D0).

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 3, 2024, to March 9, 2025) 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.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, Brandi Sistrunk, and Mitch Valerio
- 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	December 2024	December Average*	Month % of Normal	Total Last 12 Months	Annual % of Normal*
Alachua	1.43	2.78	52%	46.94	89%
Baker	1.02	2.94	35%	47.99	91%
Bradford	1.35	2.79	48%	48.55	94%
Columbia	1.11	3.01	37%	49.69	94%
Dixie	1.26	3.04	41%	55.95	96%
Gilchrist	1.12	2.95	38%	49.28	90%
Hamilton	1.27	3.24	39%	54.28	105%
Jefferson	1.35	3.74	36%	52.25	93%
Lafayette	1.37	3.15	44%	52.88	96%
Levy	1.62	2.85	57%	54.23	96%
Madison	1.20	3.57	34%	55.46	104%
Suwannee	1.37	3.13	44%	56.26	106%
Taylor	1.41	3.27	43%	52.19	92%
Union	1.06	2.90	37%	47.18	89%

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

December 2024 District Average	1.31
December Long-Term Average (1932-2023)	3.20
Historical 12-month Average (1932-2023)	54.71
Past 12-Month Total	52.82
12-Month Rainfall **Surplus**/Deficit	**-1.89**

Figure 1: Comparison of District-wide Monthly Rainfall

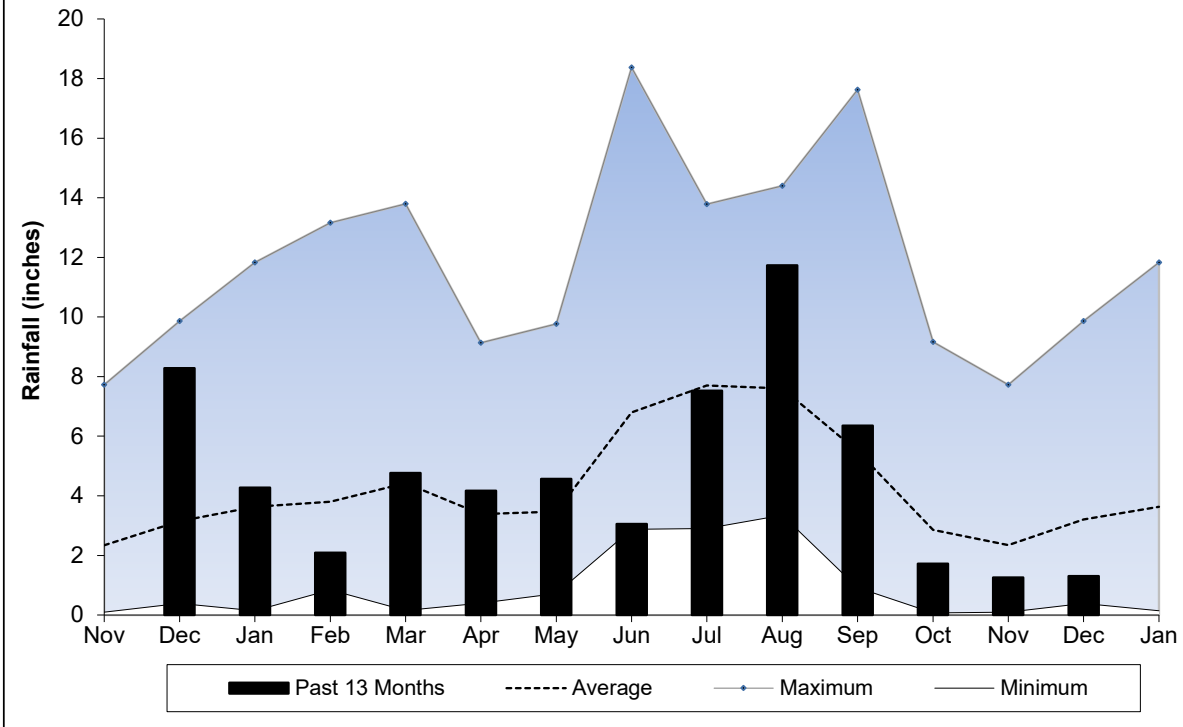


Figure 2: December 2024 SRWMD Gage-adjusted Radar Rainfall

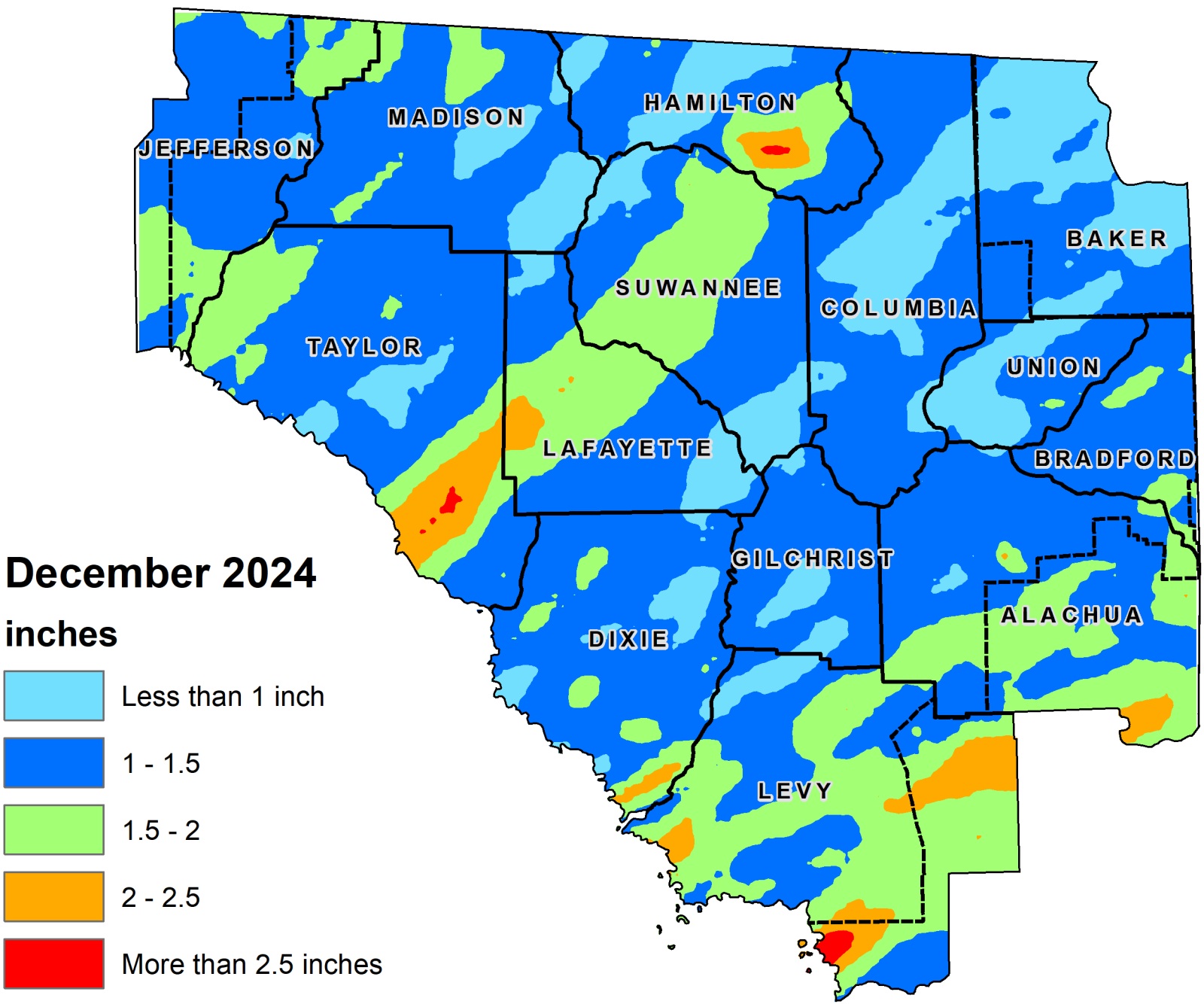
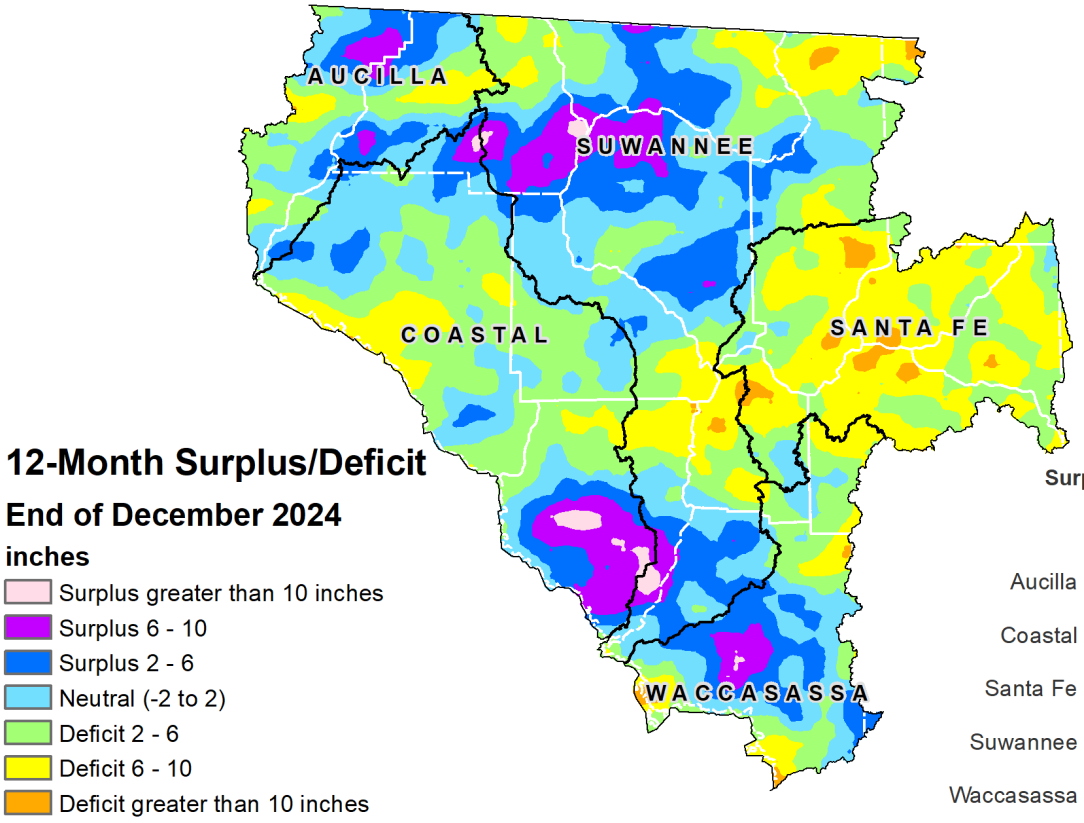


Figure 3: 12 - Month Rainfall Surplus/Deficit by River Basin through December 31, 2024



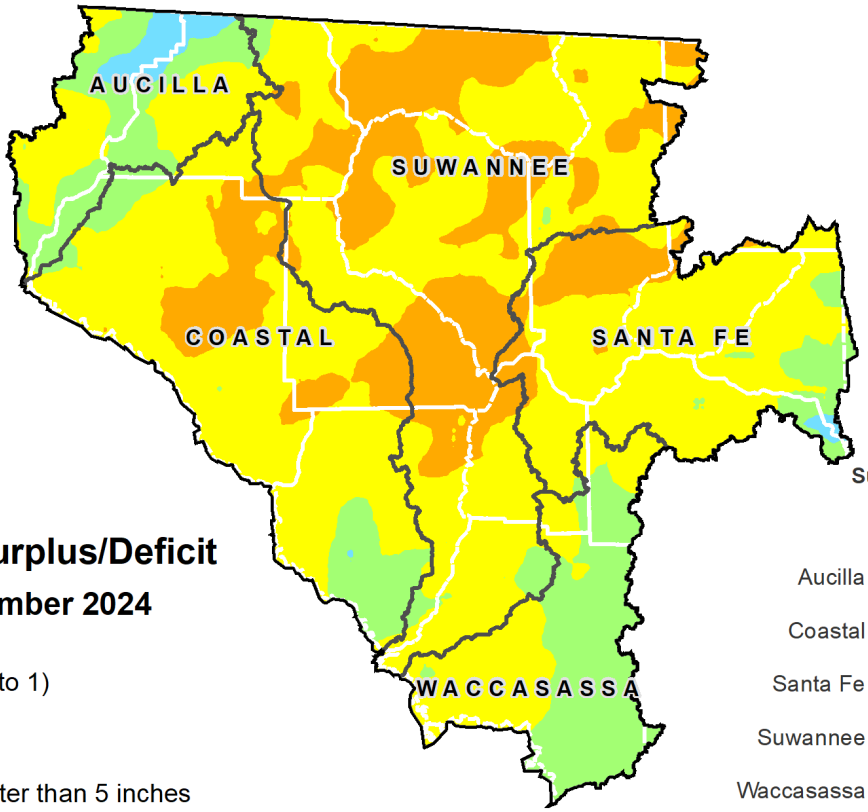
12-Month Surplus/Deficit
End of December 2024
inches

- Surplus greater than 10 inches
- Surplus 6 - 10
- Surplus 2 - 6
- Neutral (-2 to 2)
- Deficit 2 - 6
- Deficit 6 - 10
- Deficit greater than 10 inches

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

	Dec 2024	Nov 2024
Aucilla	**- 0.6**	+ 8.9
Coastal	**- 1.0**	+ 6.5
Santa Fe	**- 6.6**	- 0.6
Suwannee	**- 0.6**	+ 6.3
Waccasassa	**- 0.5**	+ 4.5

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



3-Month Surplus/Deficit
End of December 2024
inches

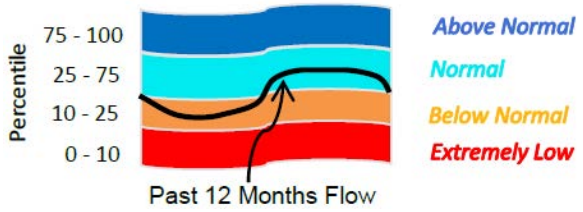
- Neutral (-1 to 1)
- Deficit 1 - 3
- Deficit 3 - 5
- Deficit greater than 5 inches

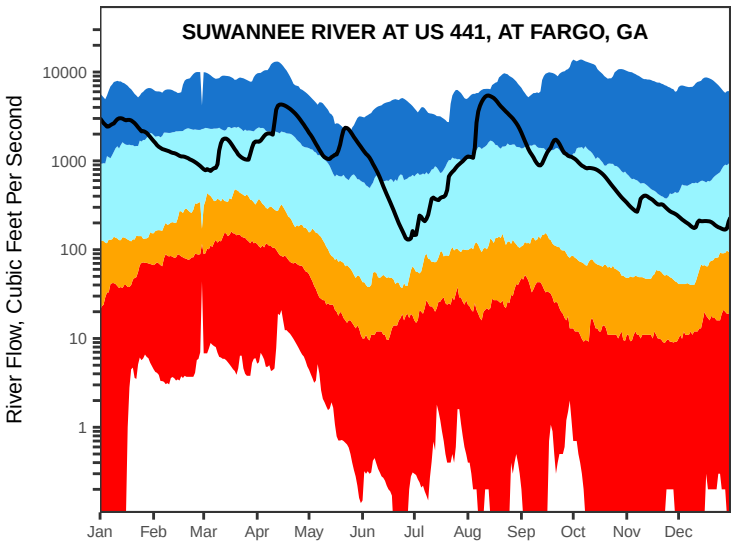
3-Month Surplus (+) or Deficit (-) By Basin

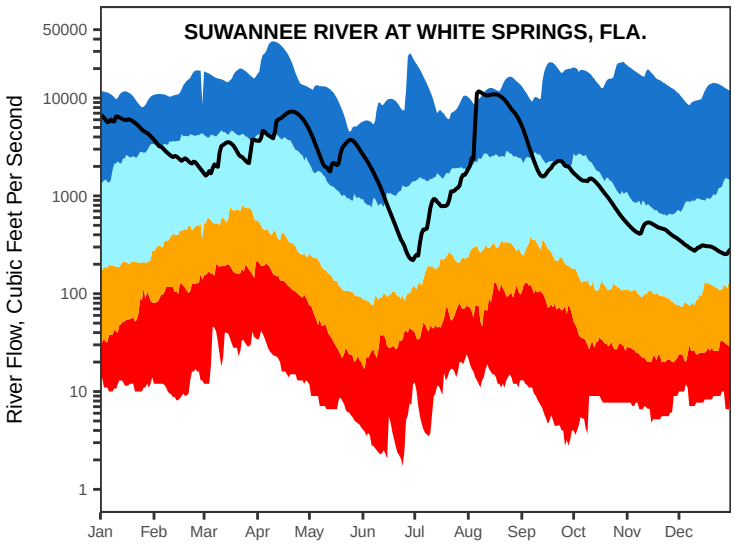
	Dec 2024	Nov 2024
Aucilla	- 2.6	+ 0.9
Coastal	- 4.1	- 0.2
Santa Fe	- 4.1	- 3.2
Suwannee	- 4.7	- 2.5
Waccasassa	- 2.9	+ 1.9

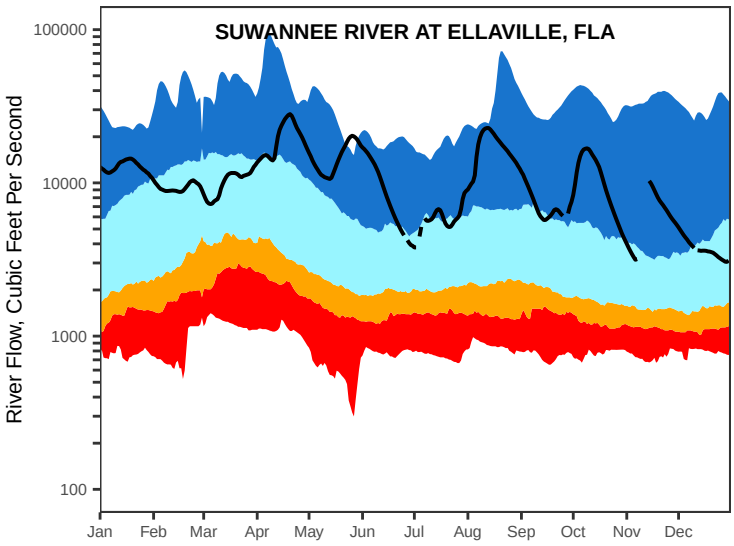
Figure 5: Daily River Flow Statistics

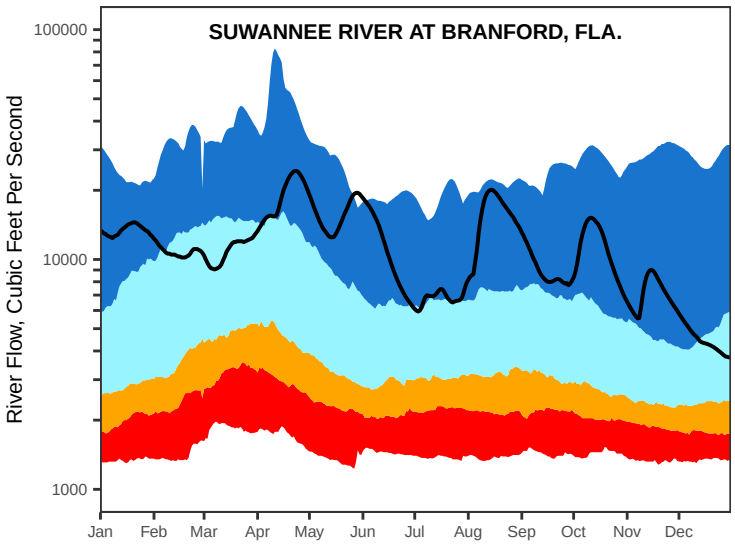
January 1, 2024 through December 31, 2024

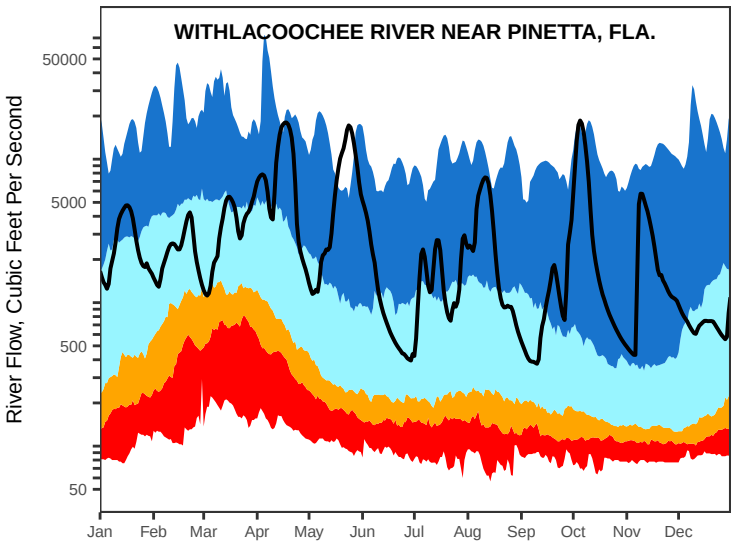












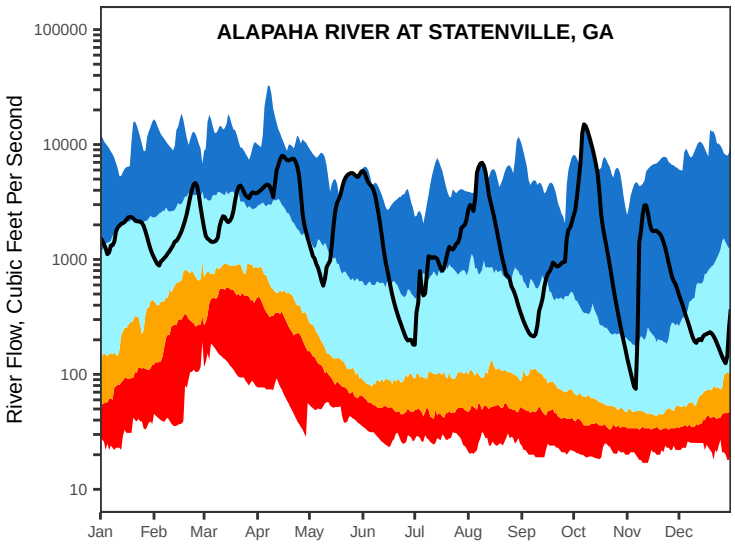
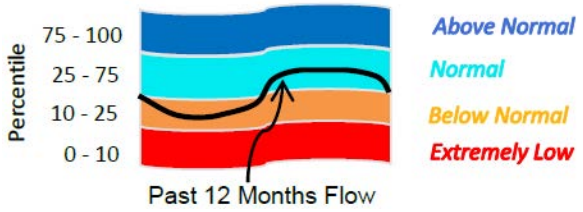
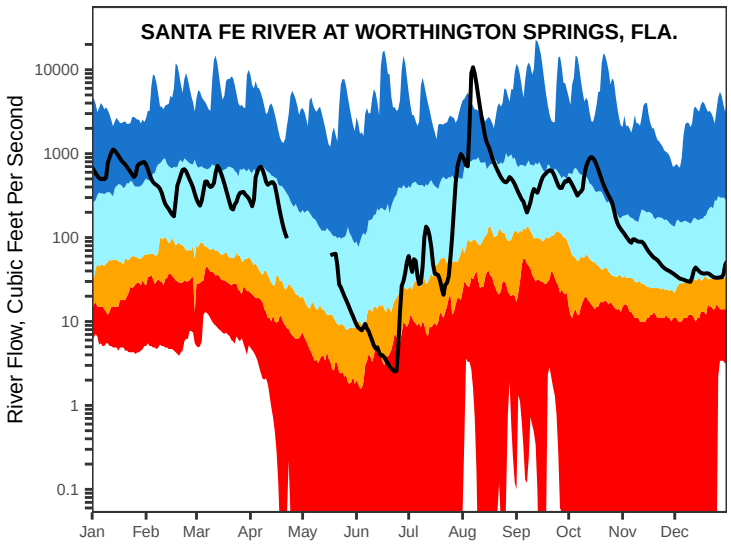
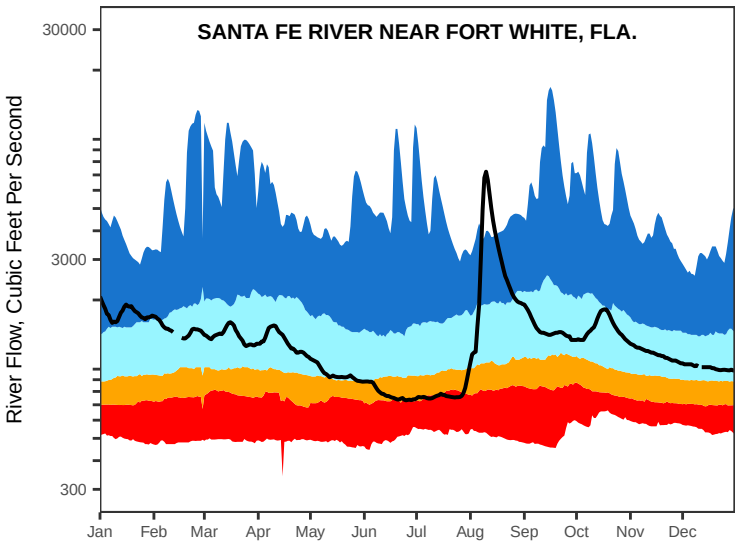


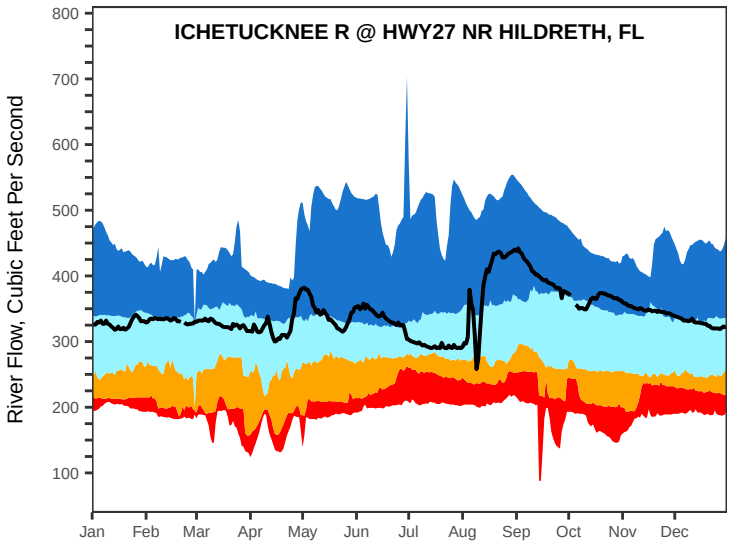
Figure 5, cont.: Daily River Flow Statistics

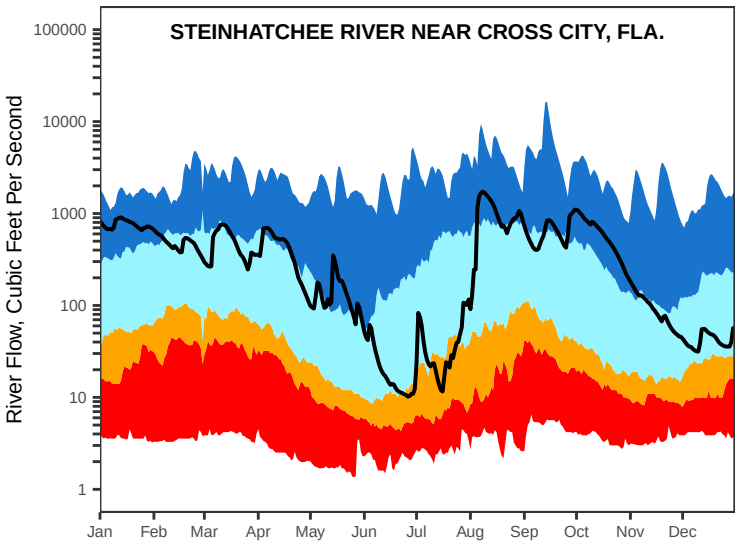
January 1, 2024 through December 31, 2024

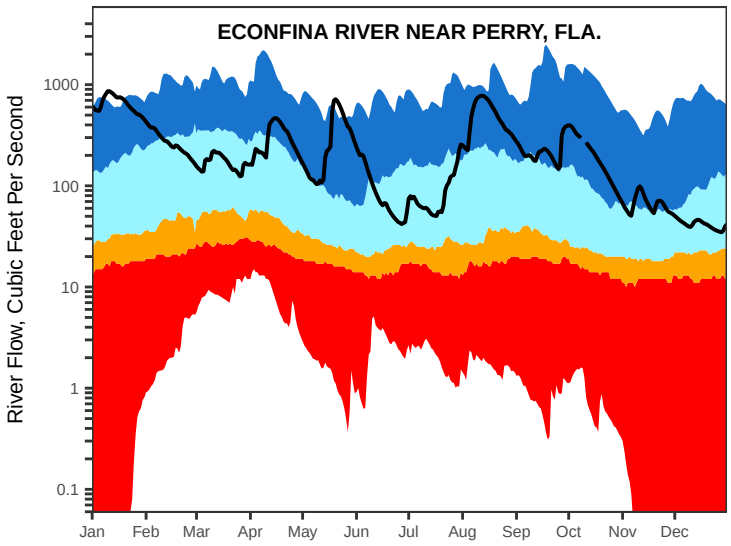












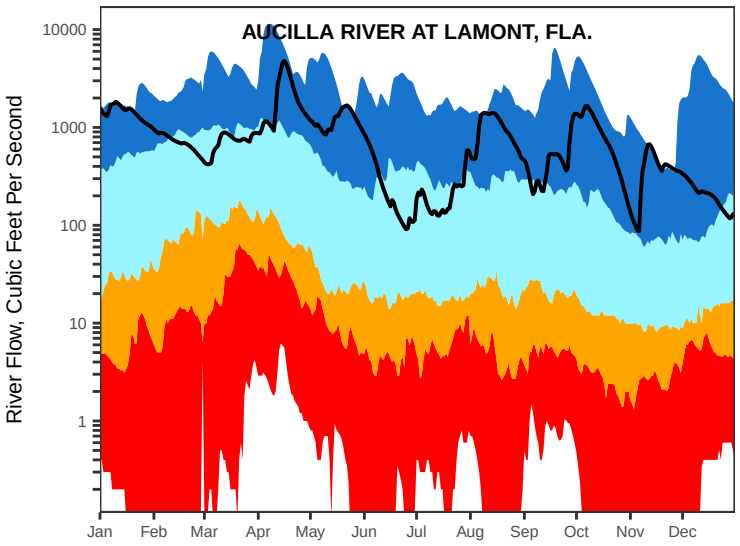
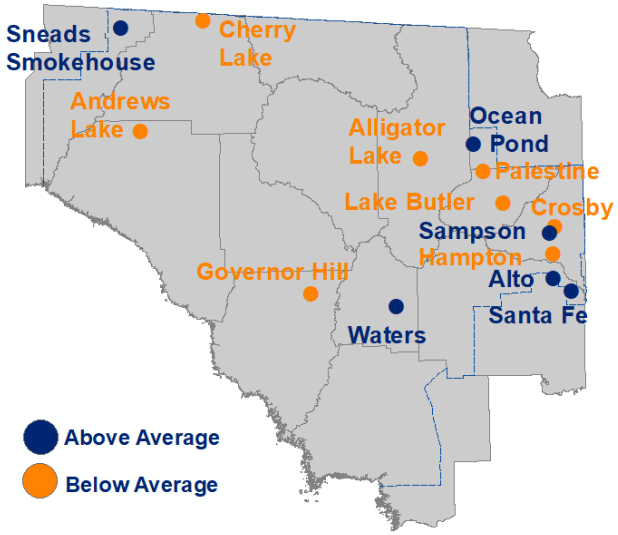



Figure 6:
Streamflow Conditions
December 2024
The Cody Scarp (or Escarpment) is an area of relatively steep topographical change that runs across north Florida. The geology above the Scarp consists of sandy soils over thick layers of mostly impermeable sediments such as clay. Streams are well-developed 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.
Alapaha
Alapaha/
Alapaha
Little
Little River
Withla-
coochee
Ochlocknee/
Thomasville
Withla-
coochee
Upper
Suwannee
Withlacoochee/
Quitman
Alapaha/
Statenville
Fargo
Withlacoochee/
Pinetta
North Prong
St. Marys
St.Mark's
Aucilla
Alapaha/
Jennings
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.
Dec 1
Dec 31
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: December 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.

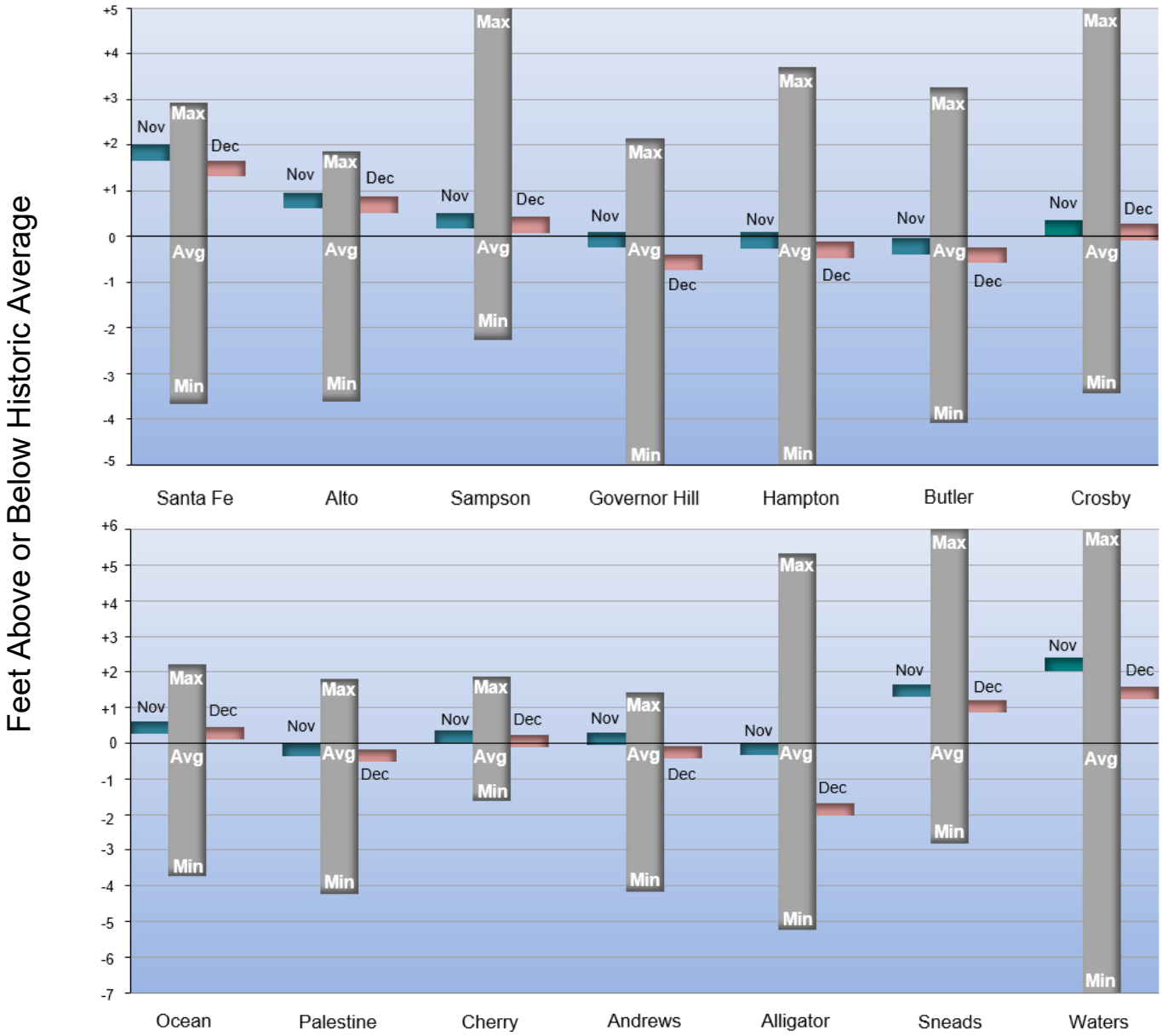


Figure 8: Flow Over the Past 12 Months, Blue Hole Spring (cubic feet per second)

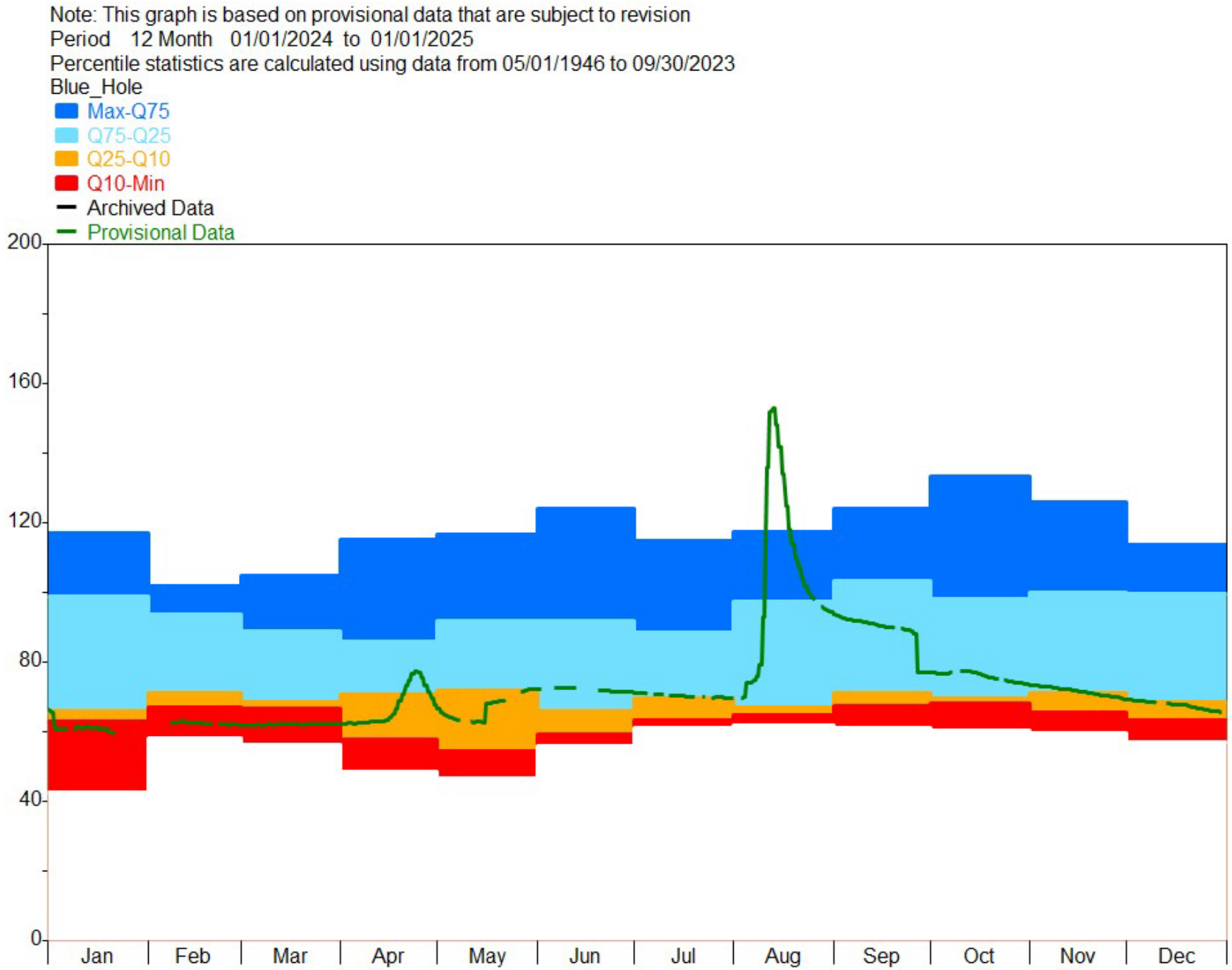
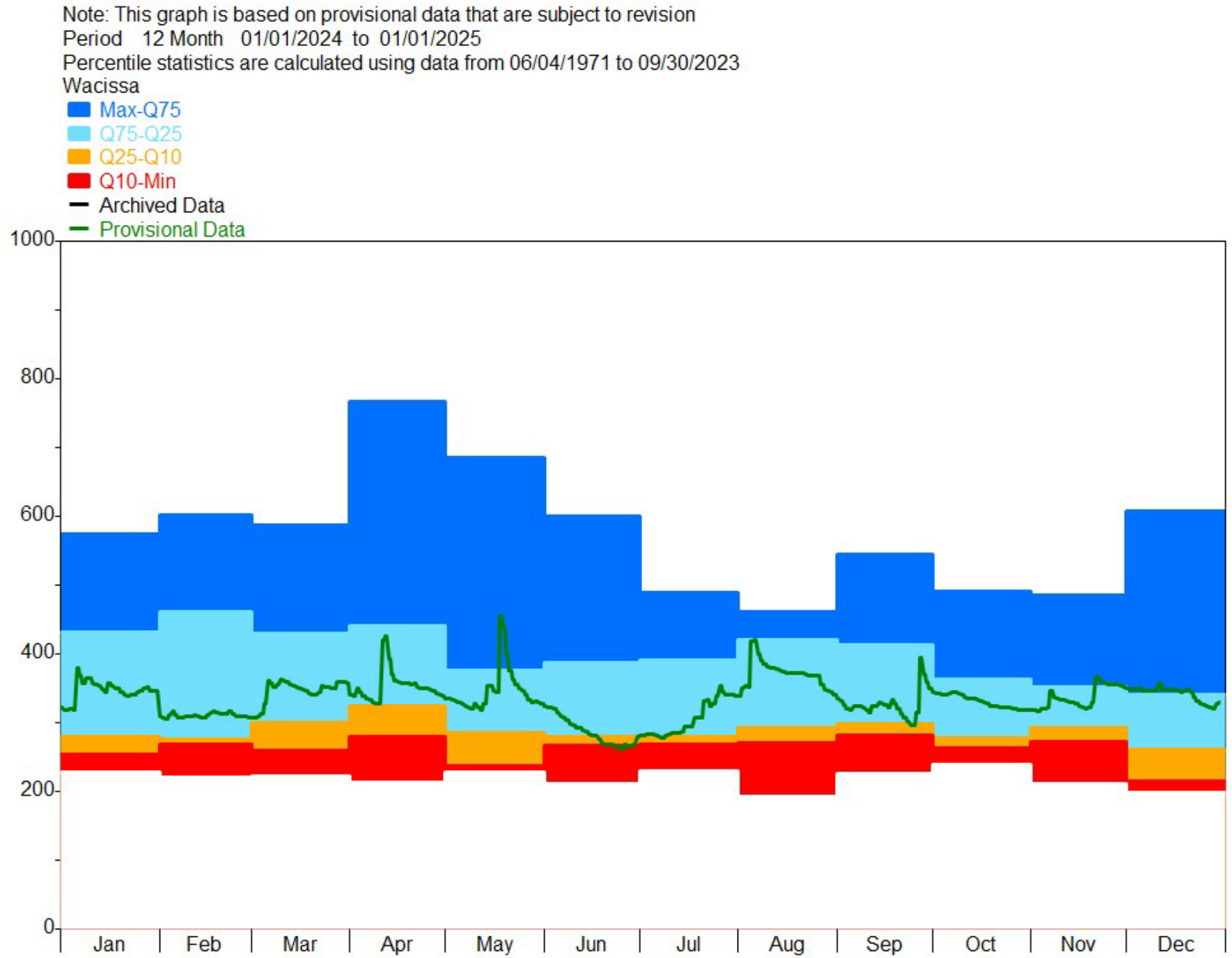


Figure 9: Flow Over the Past 12 Months, Wacissa River (cubic feet per second)



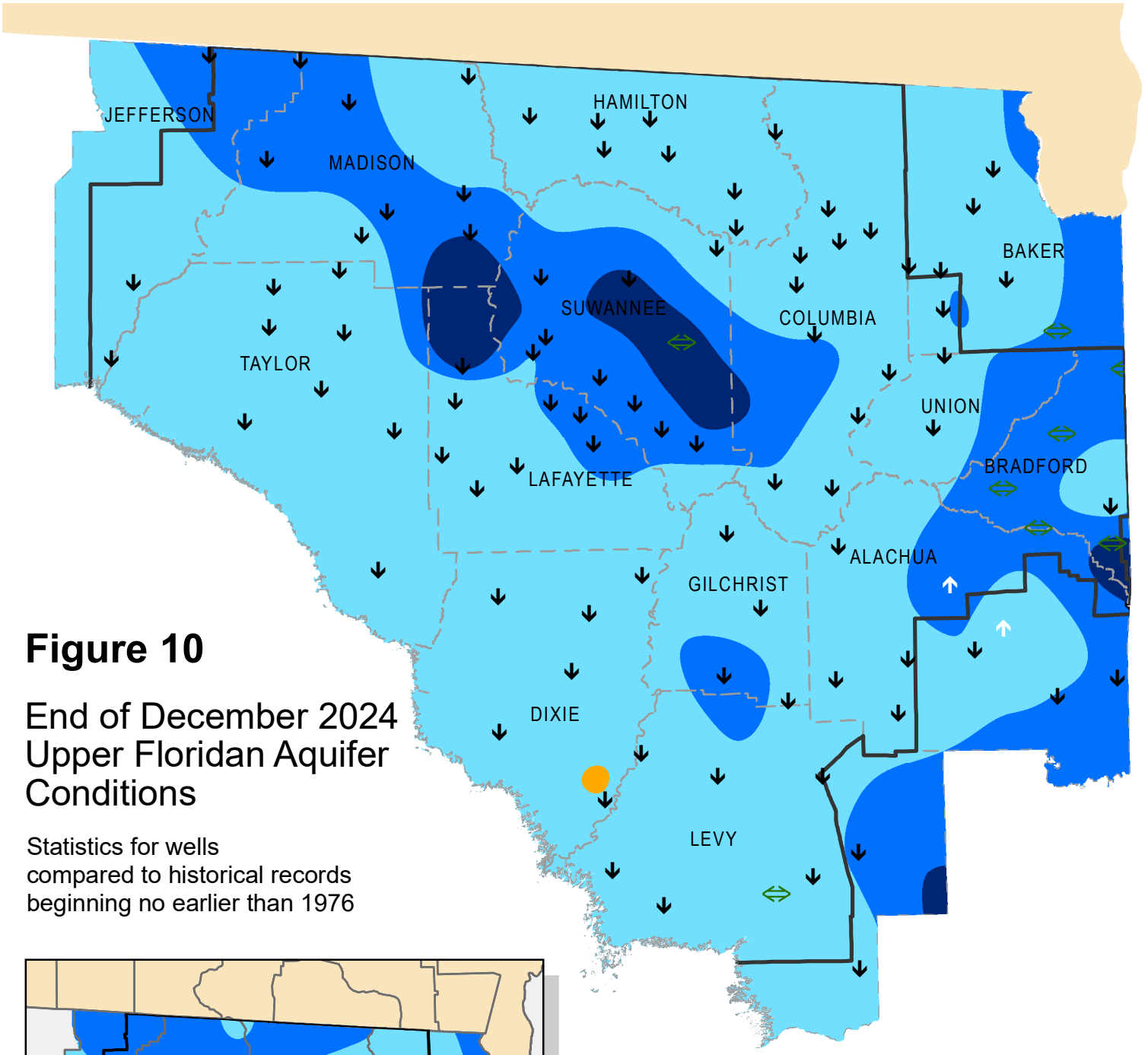
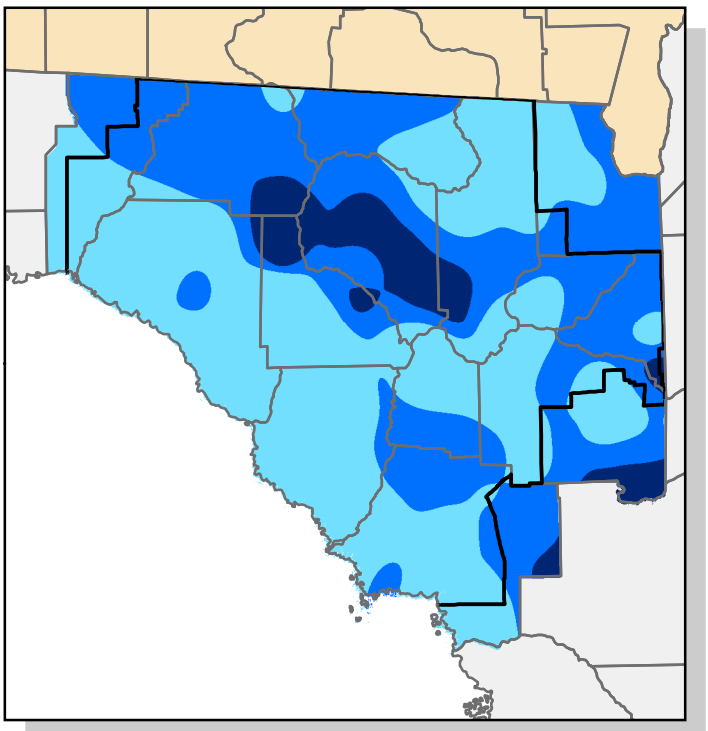


Figure 10

End of December 2024 Upper Floridan Aquifer Conditions

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



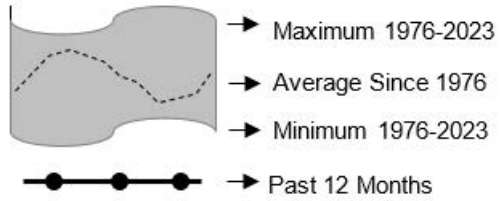
Inset: November Groundwater Percentiles

Additional wells courtesy of SJRWMD, SWFWMD and USGS

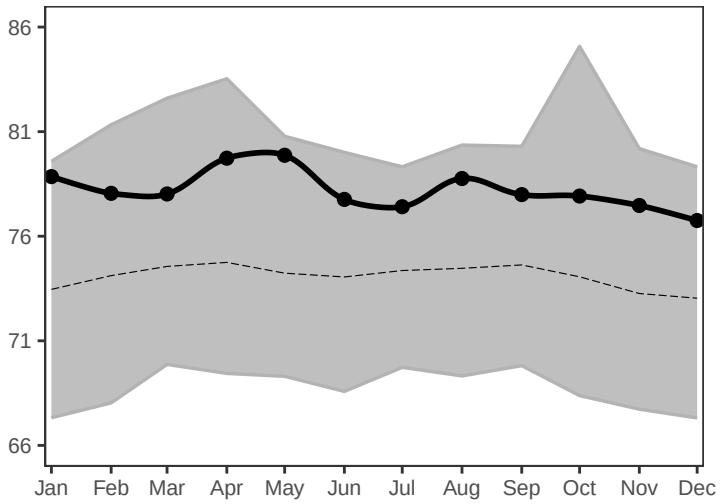
- Extremely High (Greater than 90th Percentile)
- High (75th to 90th Percentile)
- Normal (25th to 75th Percentile)
- Low (10th to 25th Percentile)
- Extremely Low (Less than 10th Percentile)
- Increase/decrease in level since last month
- Increase/decrease since last month less than one percent of historic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

Figure 11: Monthly Groundwater Statistics

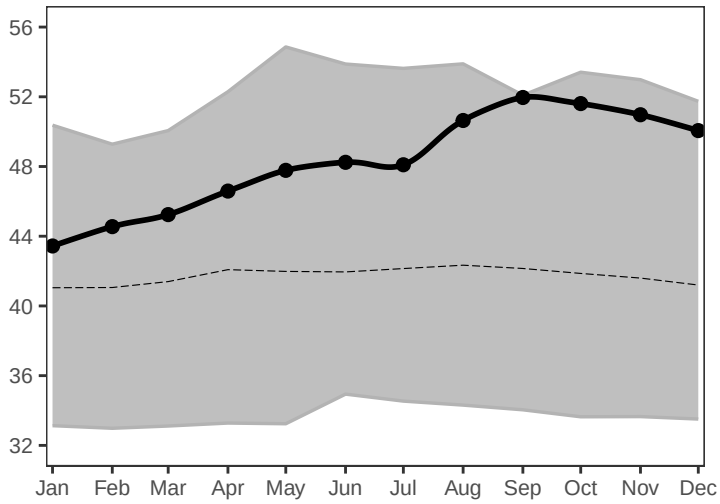
Levels January 2024 through December 2024
Period of Record Beginning 1976



Madison County N010719001
near Greenville

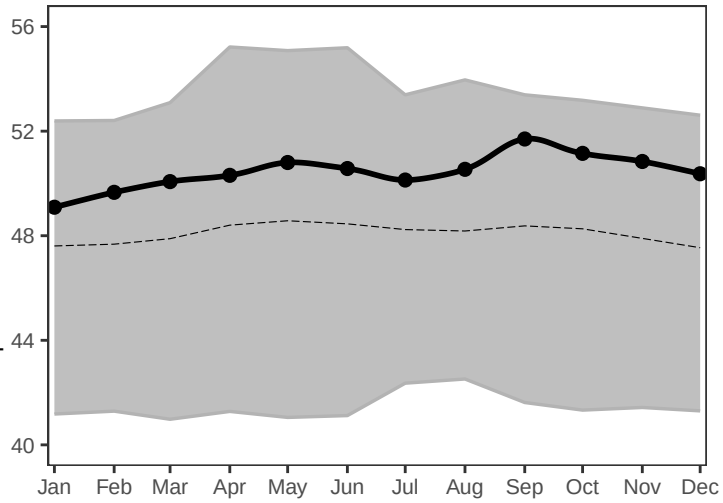


Suwannee County S021335001
near Live Oak

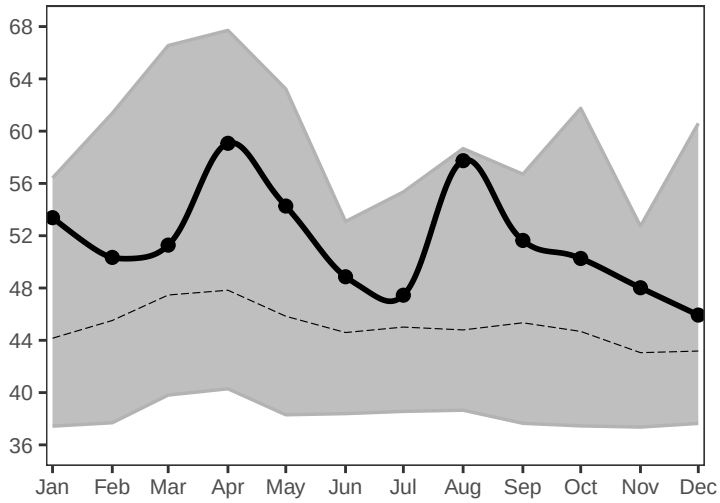


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

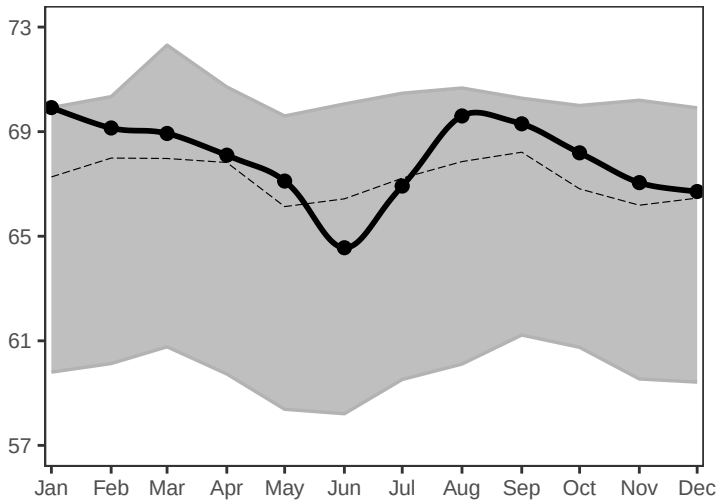
Columbia County S041705001
Lake City



Hamilton County N011422007
near Jasper



Lafayette County S061114001
near Mayo



Taylor County S040736005
Perry

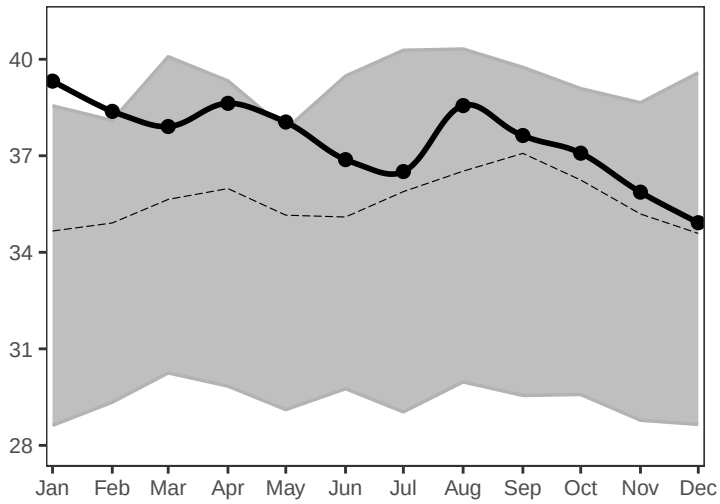
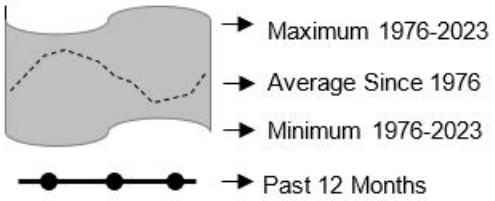
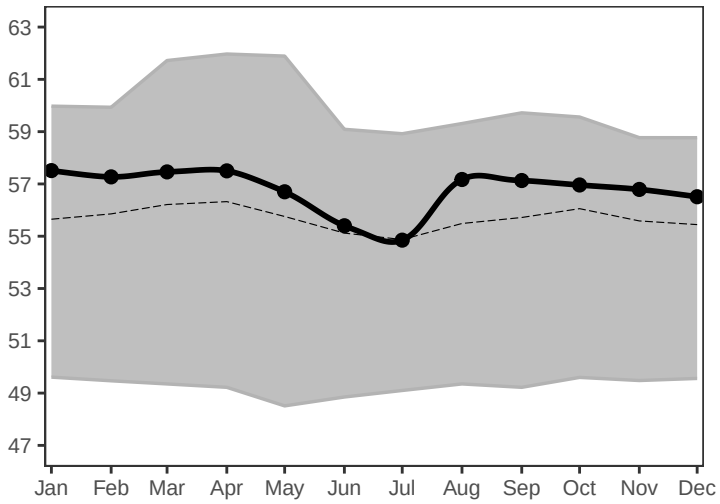


Figure 11, cont.: Monthly Groundwater Statistics

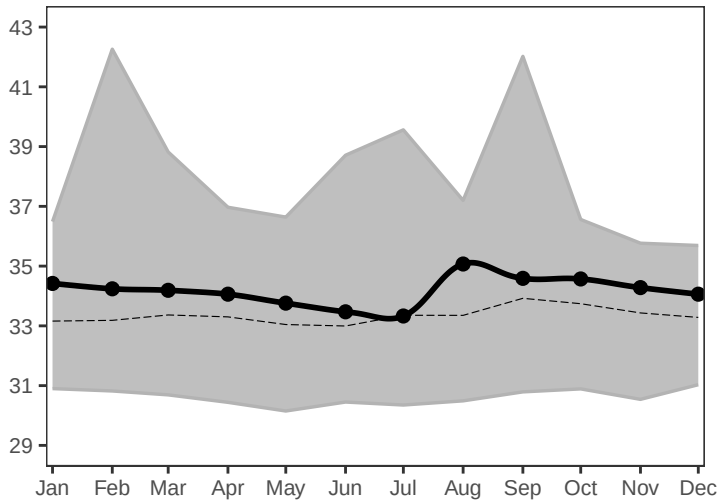
Levels January 2024 through December 2024
Period of Record Beginning 1976



Union County S051933001
near Lake Butler

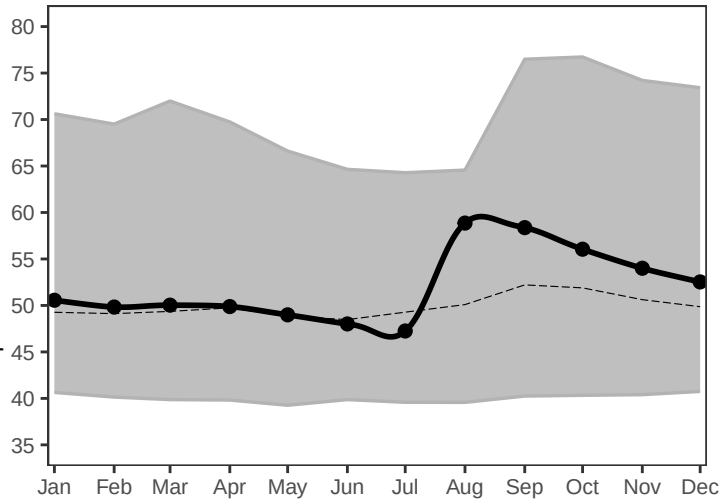


Alachua County S081703001
at High Springs

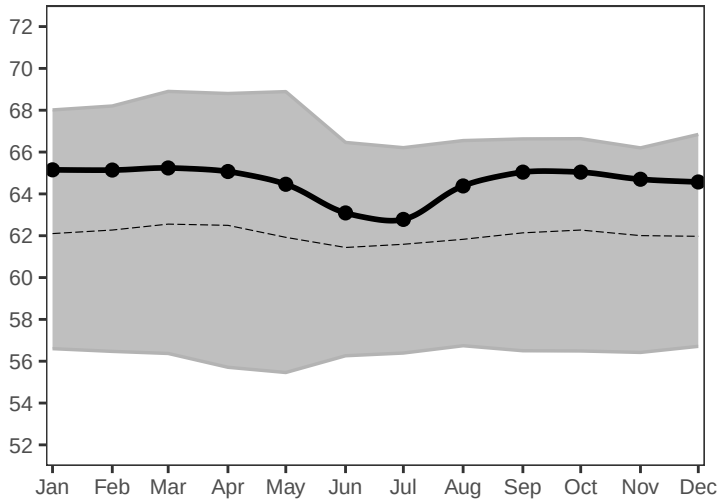


Upper Floridan Aquifer Elevation above NGVD 1929, Feet

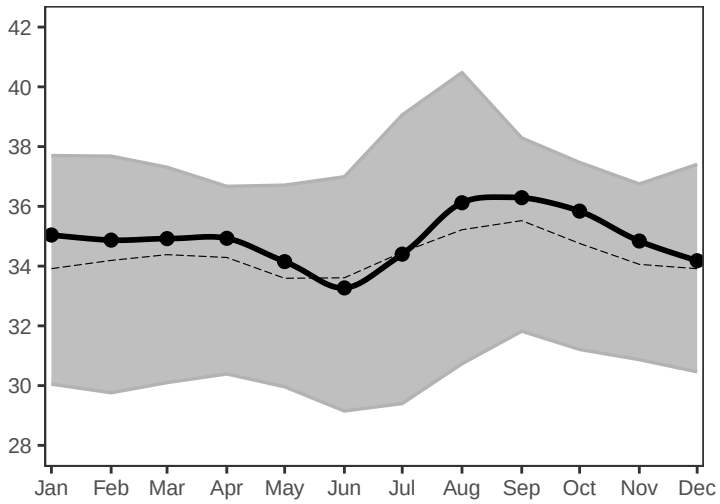
Gilchrist County S091607001
near Trenton



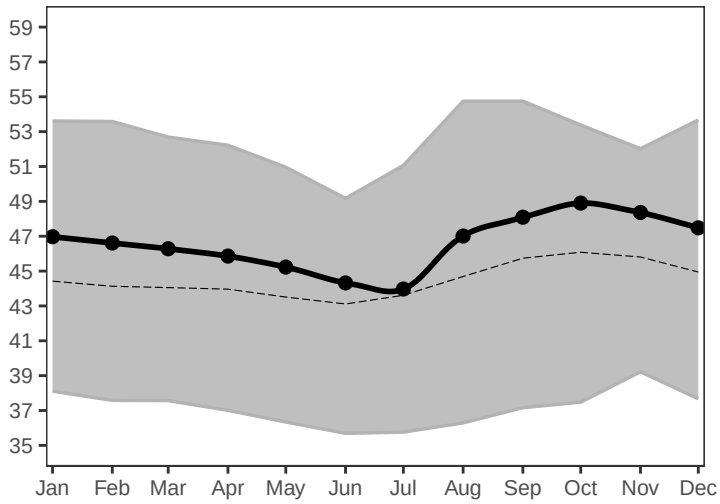
Bradford County S072132001
near Graham



Dixie County S101210001
at Cross City



Levy County S131736001
near Bronson



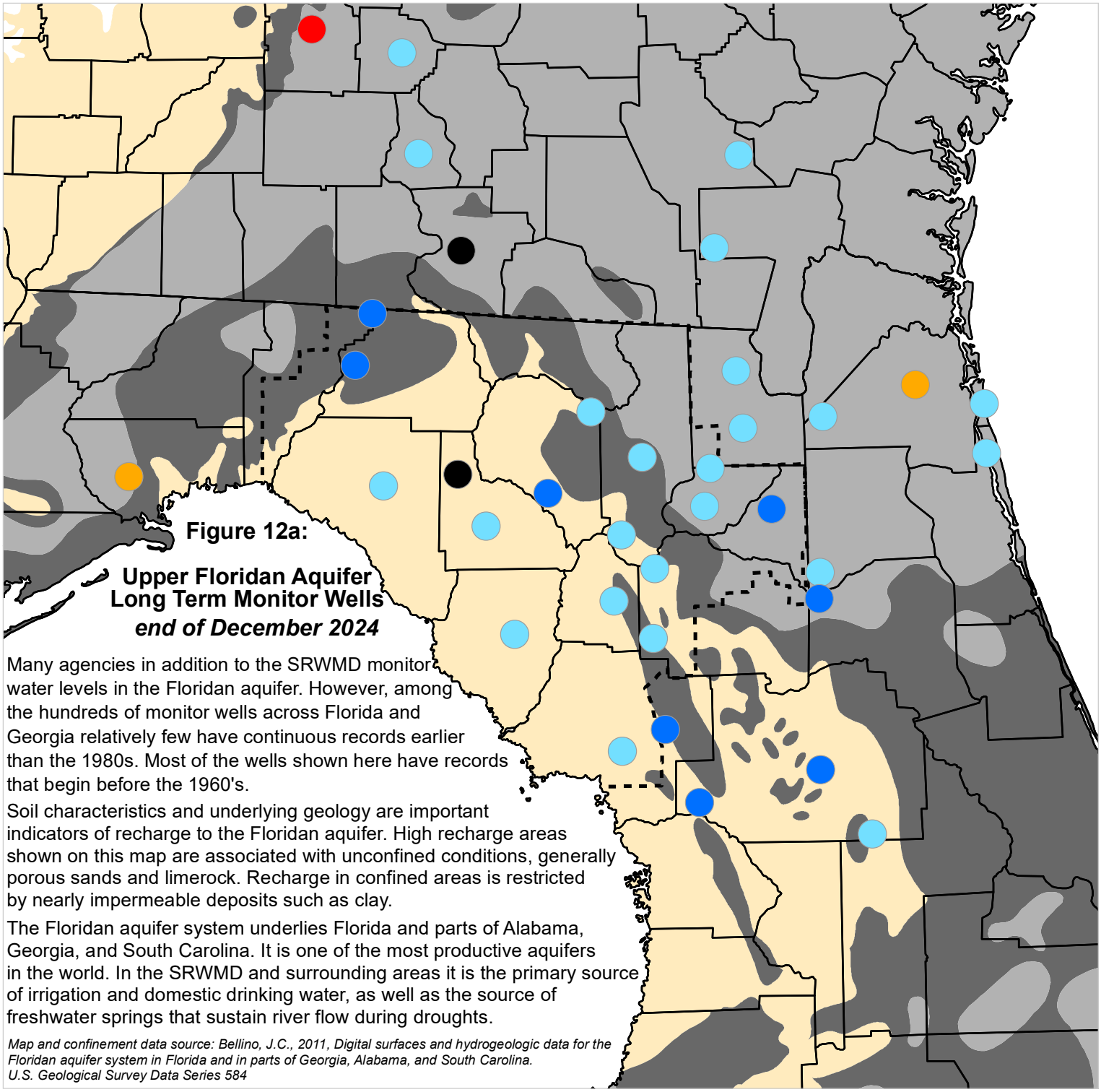


Figure 12a:

Upper Floridan Aquifer
Long Term Monitor Wells
end of December 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

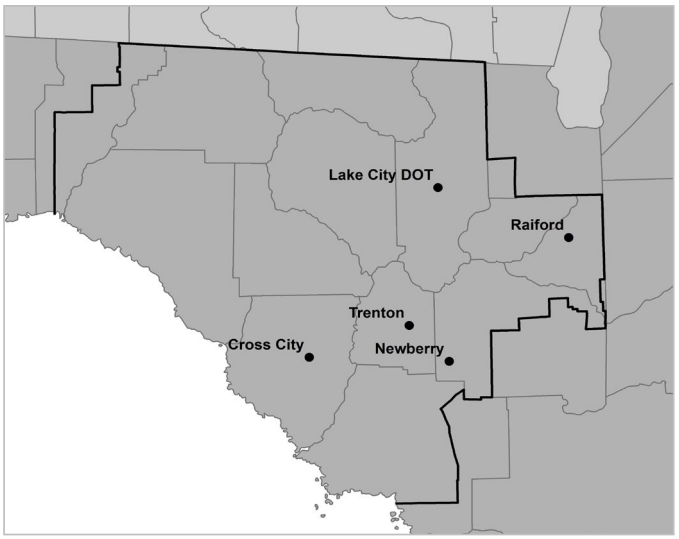
- Confined: Upper confining unit is generally greater than 100 feet thick and unbreached. Recharge is low.
- Semi-confined: Upper confining unit is generally less than 100 feet thick, breached, or both. Recharge is moderate.
- Unconfined: Upper confining unit is absent or very thin. Recharge is high.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

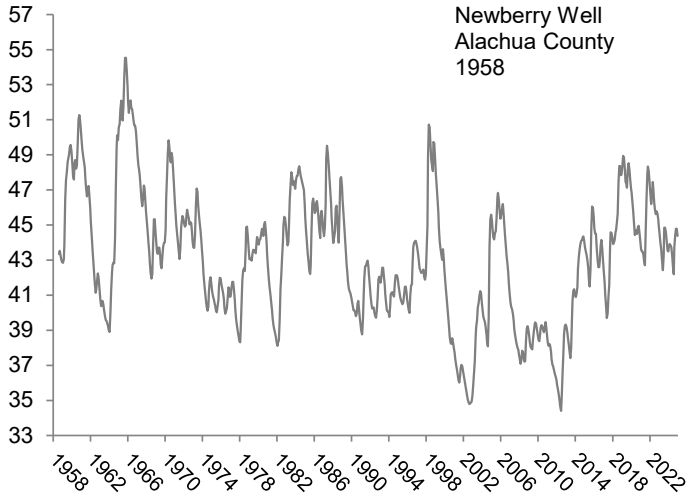
Percentile of Most Recent Water Level Relative to Entire Record

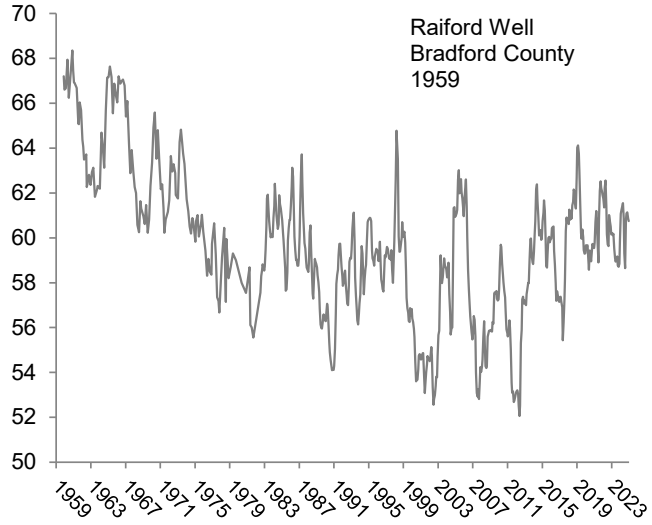
- Very High (Greater than 90th Percentile)
- High (75th to 90th Percentile)
- Normal (25th to 75th Percentile)
- Low (10th to 25th Percentile)
- Very Low (Less than 10th Percentile)
- Data Not Available

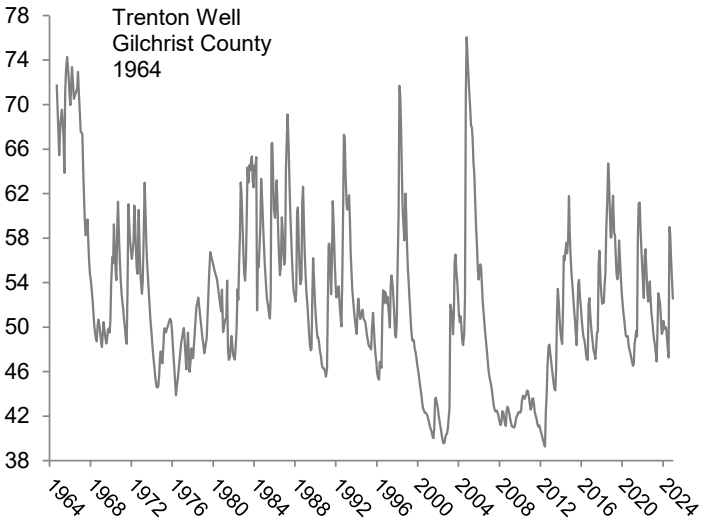
Figure 12b: Regional Long Term Upper Floridan Aquifer Levels

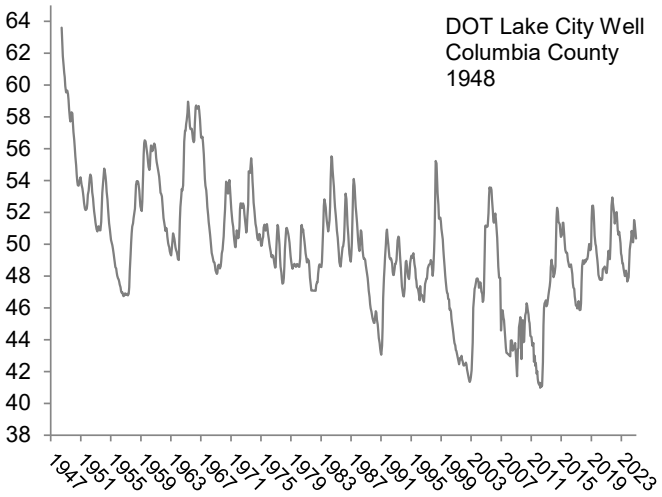
Data through December 2024

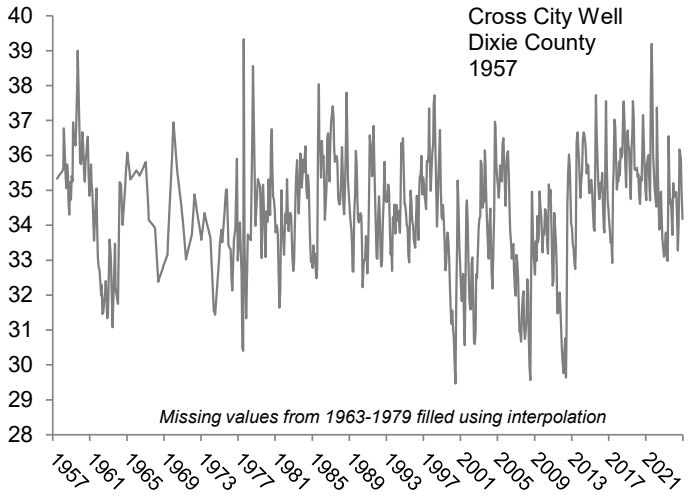












Upper Floridan Aquifer Elevation above NGVD 1929, Feet