



Hydrologic Conditions Report

September 2024

| | |
|-------------------------|----|
| Rainfall..... | 2 |
| Climate Outlook | 7 |
| Drought Conditions..... | 7 |
| Surface Water..... | 8 |
| Spring Flows | 13 |
| Aquifer Levels | 16 |

Summary

September 2024 was characterized by much above normal precipitation in the eastern portion of the District and slightly above normal temperatures (averaging around 78.8 degrees Fahrenheit). In the eastern portion of the District, these conditions contributed to generally normal or above normal aquifer levels and normal or above normal streamflow. In the western portion of the District, near normal precipitation contributed to generally below normal aquifer levels and normal or below normal streamflow. Spring flow was near normal across most of the Panhandle. Increased precipitation through September 2024 resulted in a removal of severe drought conditions, but abnormally dry conditions remain in the western portion of the District.



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Rainfall

The District in September 2024 recorded an average of 12.21 inches of rain across the Panhandle. This was 6.50 inches (72.5%) above the District normal rainfall amount for the month of September, 5.71 inches. Normal rainfall is defined as average monthly rainfall for the 1991 to 2020 reference period. Though the average observed rainfall across the District was classified as much above normal, precipitation amounts varied spatially. The highest rainfall amounts of around 31.50 inches occurred in southwestern Franklin County while the lowest rainfall amounts of around 2.25 inches occurred in northwestern Escambia County ([Table 1](#); [Figures 1 through 7](#)).

The most significant rain event occurred between September 26 and 27, 2024, when Hurricane Helene, a Category 4 hurricane, pushed into the Big Bend area. Rain amounts from Hurricane Helene varied from around 15.50 inches in portions of Franklin, Liberty, and Gulf Counties to less than 0.50 inches in portions of Escambia, Santa Rosa, and Okaloosa Counties.

September 2024 was also a record-breaking month for rainfall at Marianna Municipal Airport in Jackson County due in part to Hurricane Helene. Marianna Municipal Airport received 19.55 inches during the month of September 2024, breaking the previous September record of 14.91 inches of rain by 4.64 inches. Of the 19.55-inch total received by Marianna Municipal Airport, 9.37 inches was a result of Hurricane Helene.

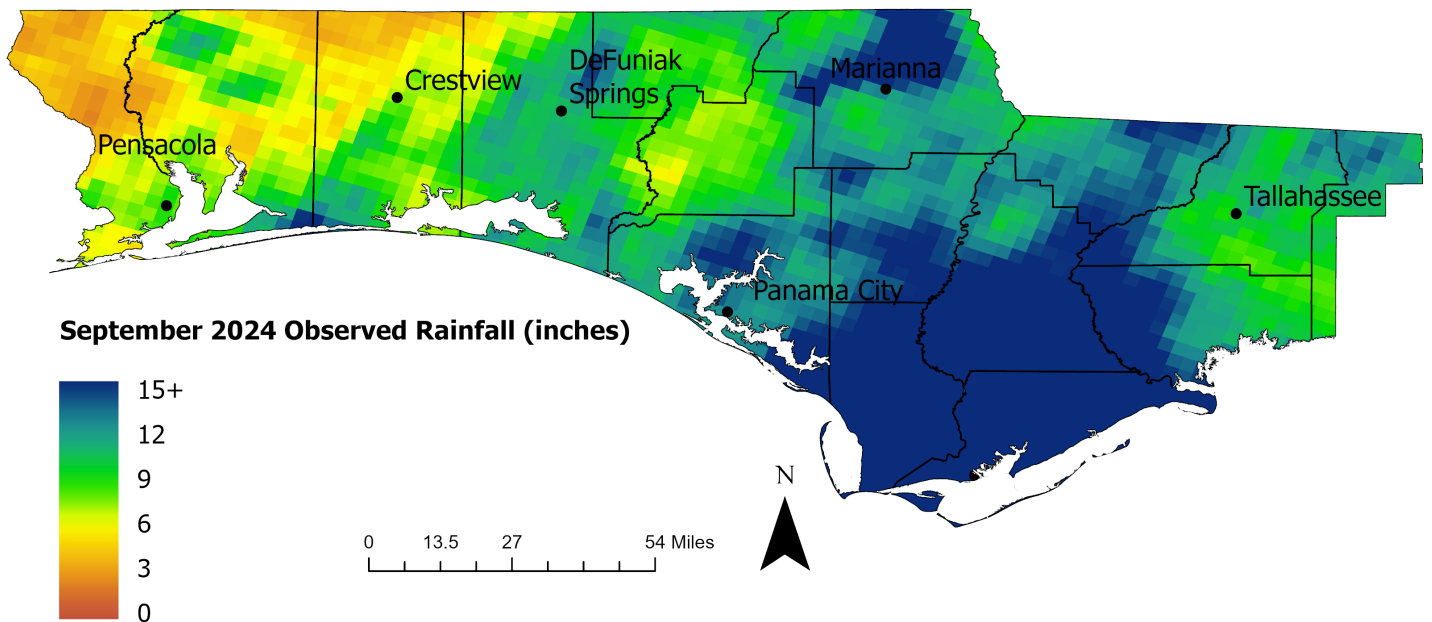


Table 1: September 2024 rainfall compared to 30-year normal monthly rainfall for Tallahassee, Marianna, Niceville, and Pensacola

| Station | September Normal Rainfall (1991 to 2020) | September 2024 Observed Rainfall | Percent Difference |
|------------------------------|--|----------------------------------|--------------------|
| Tallahassee Regional Airport | 4.91 | 11.21 | 78.2% |
| Marianna Regional Airport | 4.06 | 19.55 | 131.2% |
| Niceville, FL | 6.97 | 3.51 | -66.0% |
| Pensacola Regional Airport | 6.61 | 8.69 | 27.2% |

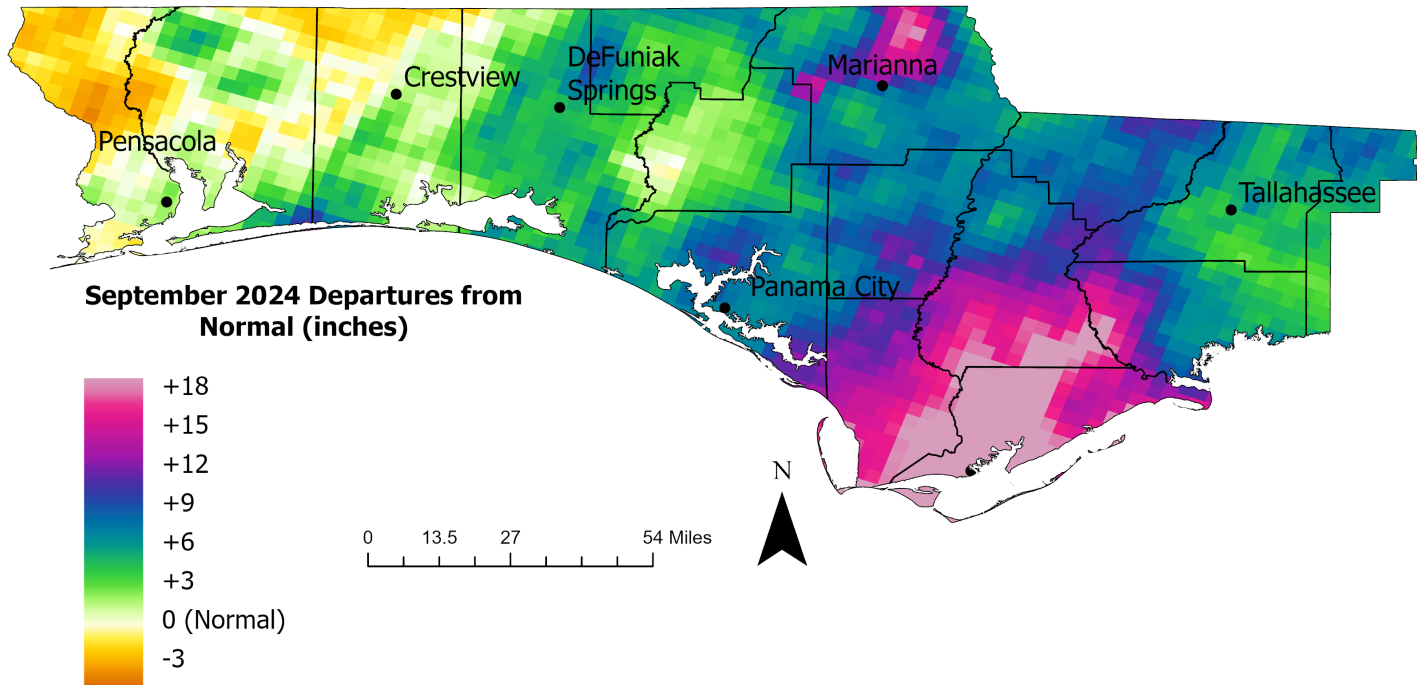
Source: <https://www.weather.gov/wrh/Climate?wfo=tae>
<https://www.weather.gov/wrh/Climate?wfo=mob>

Figure 1: District-wide September 2024 observed rainfall



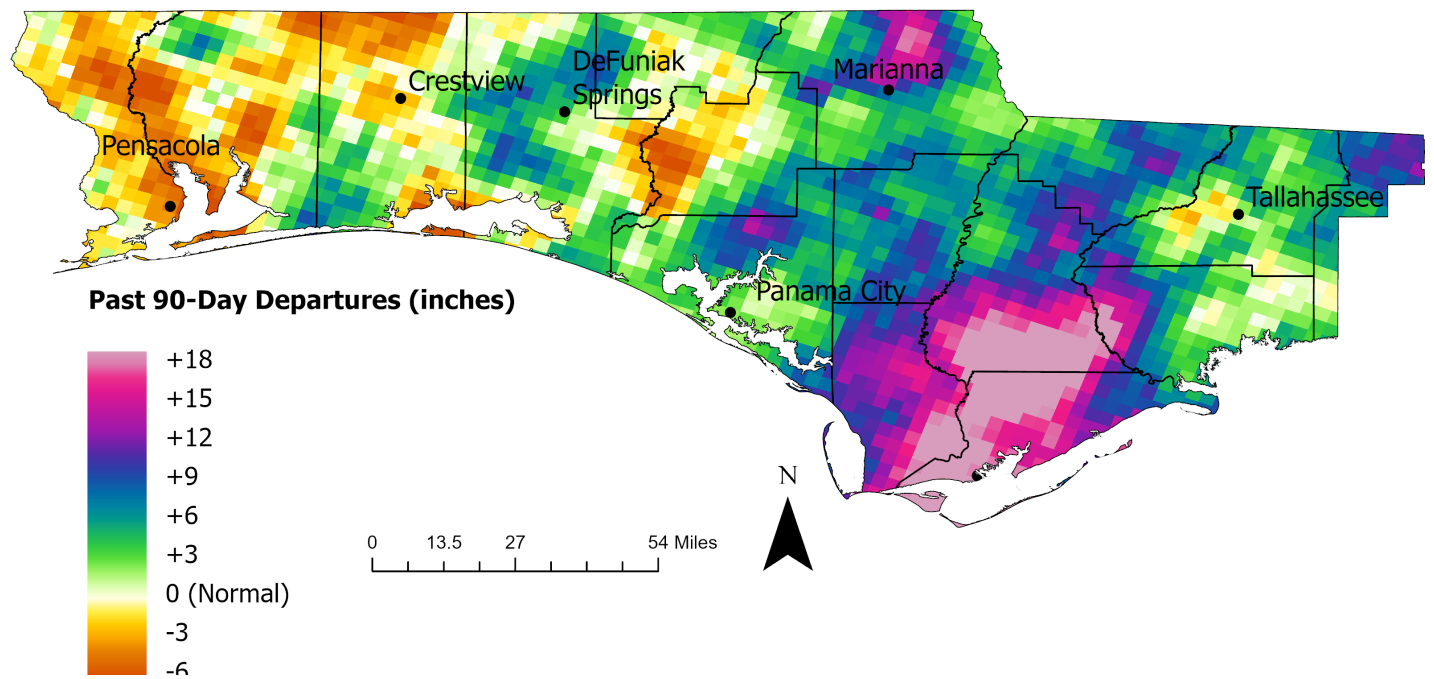
Source: <https://water.weather.gov/precip/download.php>

Figure 2: District-wide September 2024 precipitation departure from normal



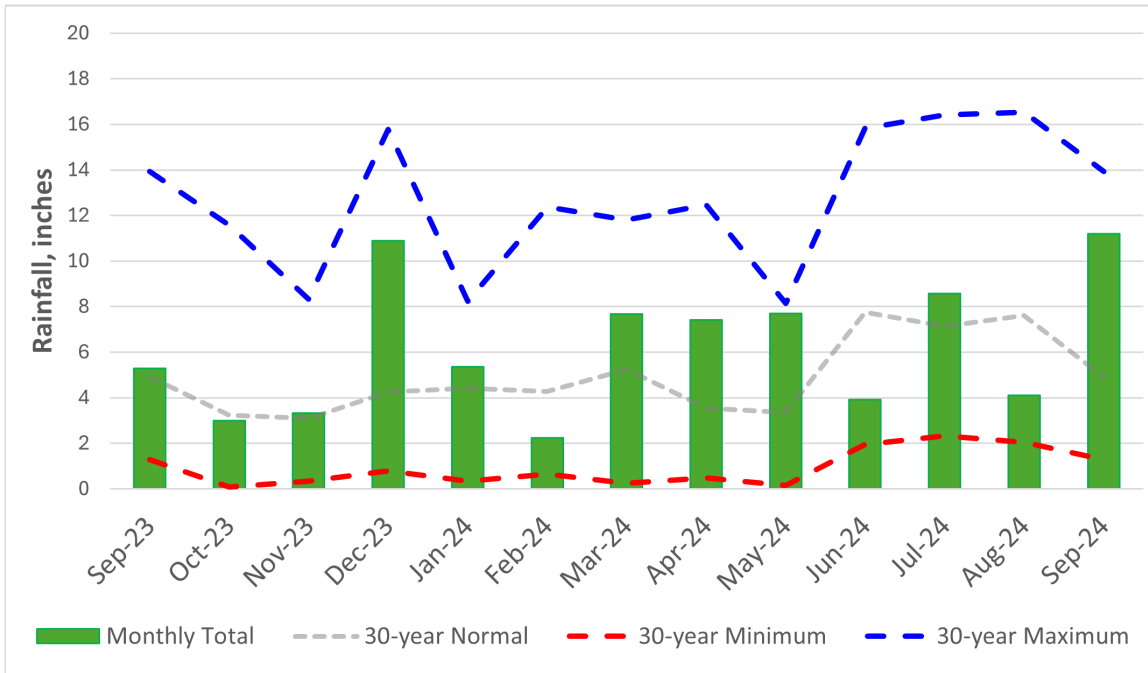
Source: <https://water.weather.gov/precip/download.php>

Figure 3: District-wide precipitation departure from normal precipitation for the previous 90 days



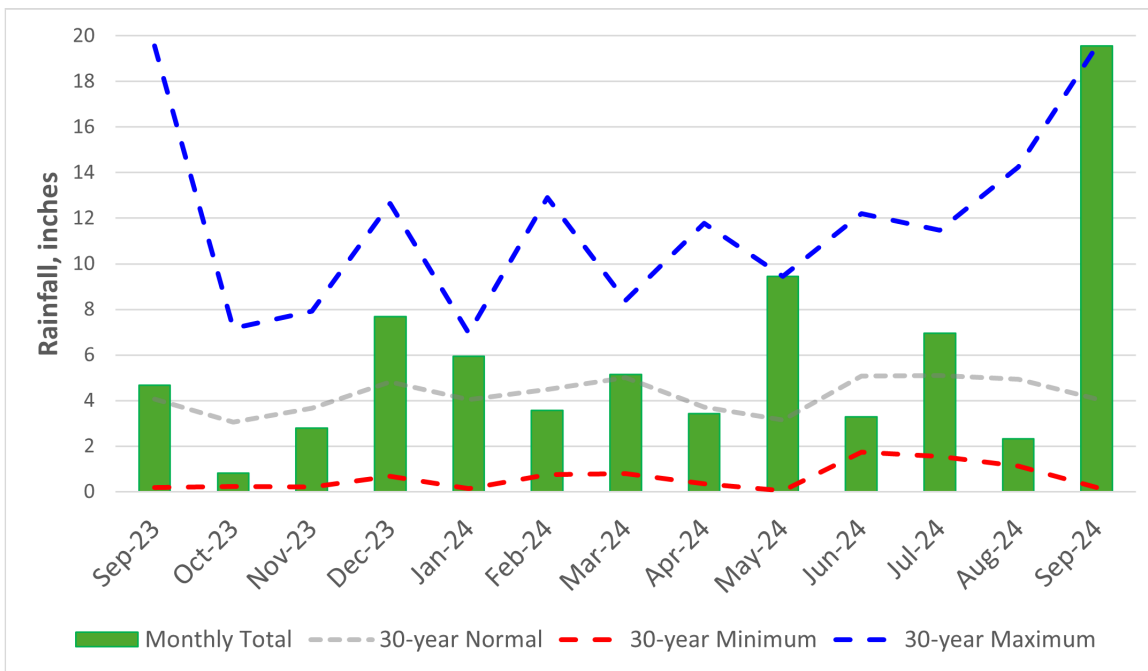
Source: <https://water.weather.gov/precip/download.php>

Figure 4: Observed rainfall at Tallahassee Regional Airport for September 2023 to September 2024 compared to the 30-year normal, minimum, and maximum precipitation for each month



Source: <https://www.weather.gov/wrh/Climate?wfo=tae>

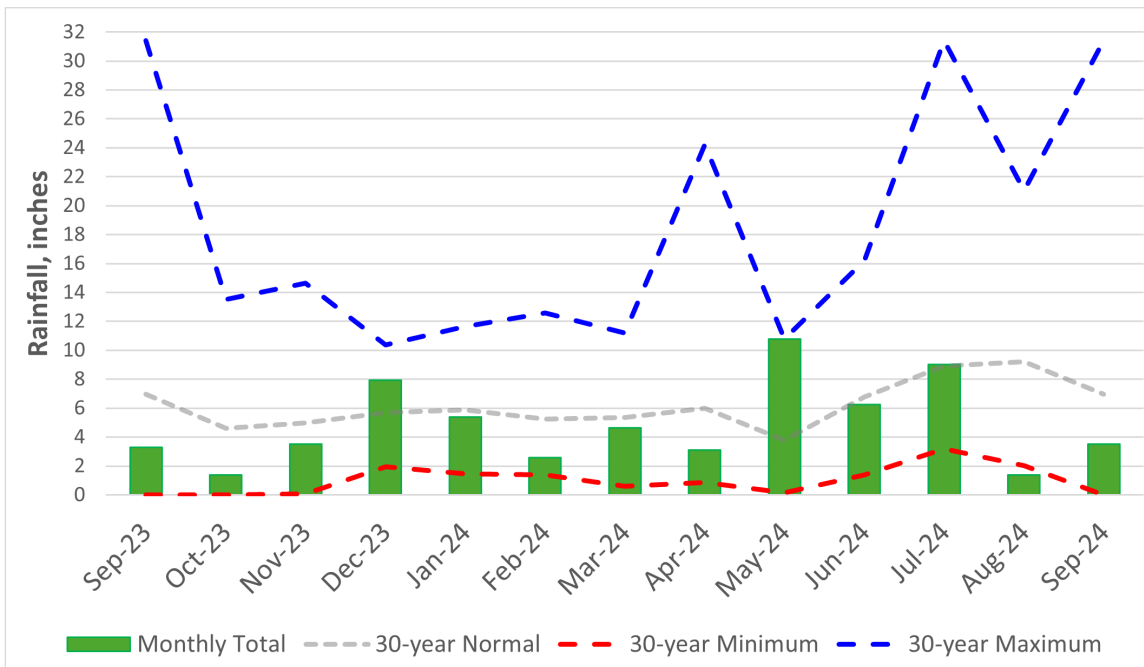
Figure 5: Observed rainfall at Marianna Regional Airport for September 2023 to September 2024 compared to the 30-year normal, minimum, and maximum precipitation for each month



Source: <https://www.weather.gov/wrh/Climate?wfo=tae>

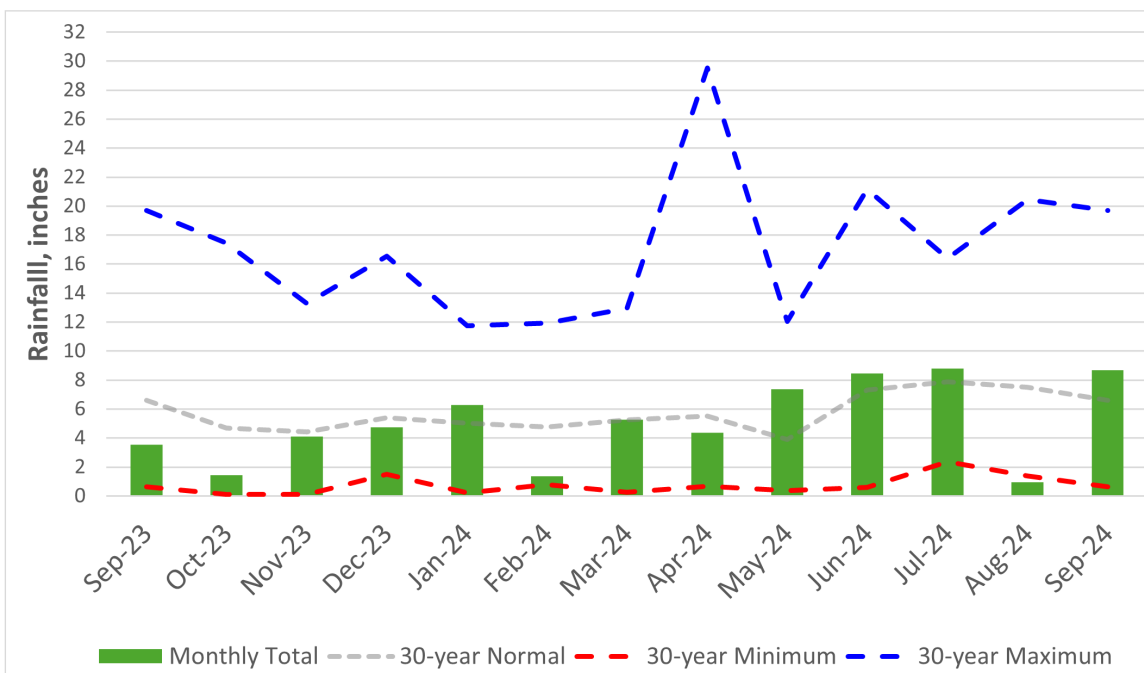


Figure 6: Observed rainfall in Niceville for September 2023 to September 2024 compared to the 30-year normal, minimum, and maximum precipitation for each month



Source: <https://www.weather.gov/wrh/Climate?wfo=mob>

Figure 7: Observed rainfall at Pensacola Regional Airport for September 2023 to September 2024 compared to the 30-year normal, minimum, and maximum precipitation for each month



Source: <https://www.weather.gov/wrh/Climate?wfo=mob>



Climate Outlook

According to NOAA’s climate prediction center, the forecast issued October 1, 2024, for October 2024 shows equal chances for above or below normal temperatures and a slight probability of above normal rainfall amounts across the District.

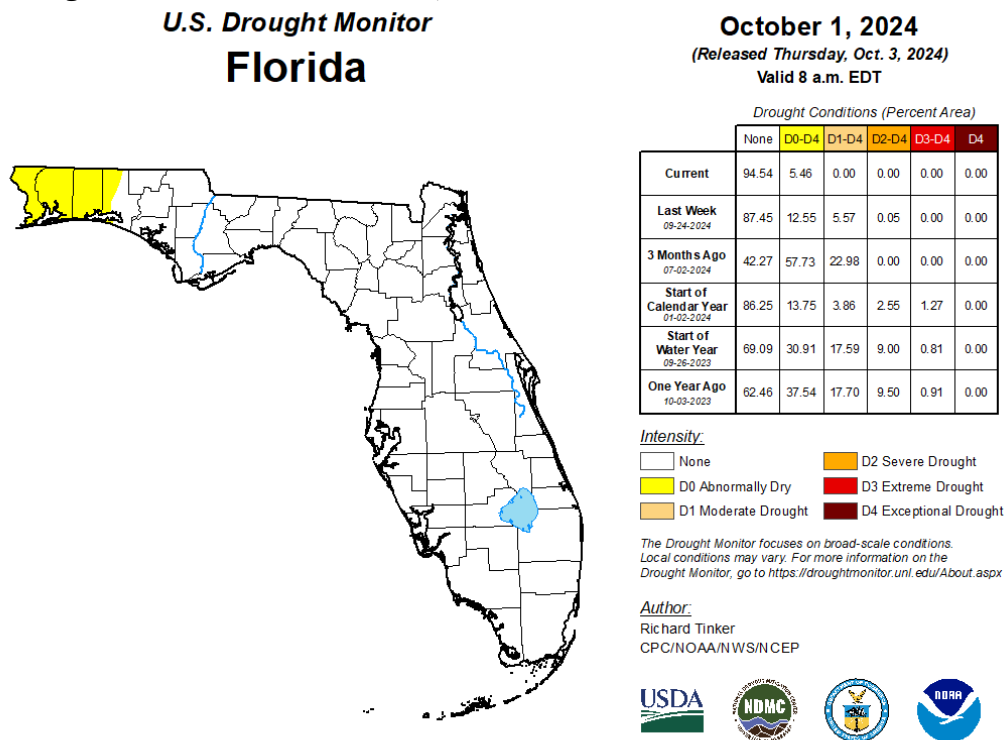
As of September 30, 2024, ENSO-neutral conditions are present and a La Niña Watch has been advised. La Niña conditions are favored to develop during September through November (71% chance) and are forecast to persist into the upcoming winter season. A La Niña pattern during hurricane season creates ideal conditions for the development of tropical cyclones in the Atlantic basin. In the winter, La Niña is associated with warmer and drier conditions than usual for the southern United States.

Source: <https://www.climate.gov/news-features/understanding-climate/us-climate-outlook-october-2024>
https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

Drought Conditions

The U.S. Drought Monitor report released October 1, 2024, showed the western portion of the District under Abnormally Dry conditions (Figure 8), an improvement from the severe drought conditions present at the end of August. Drought conditions to the east have been completely alleviated, likely due to the tremendous precipitation amounts received during Hurricane Helene in late September (Figure 1). According to the U.S. Monthly Drought Outlook valid for October 2024, drought conditions are expected to improve by the conclusion of the month.

Figure 8. Florida Drought Conditions on October 1, 2024



droughtmonitor.unl.edu

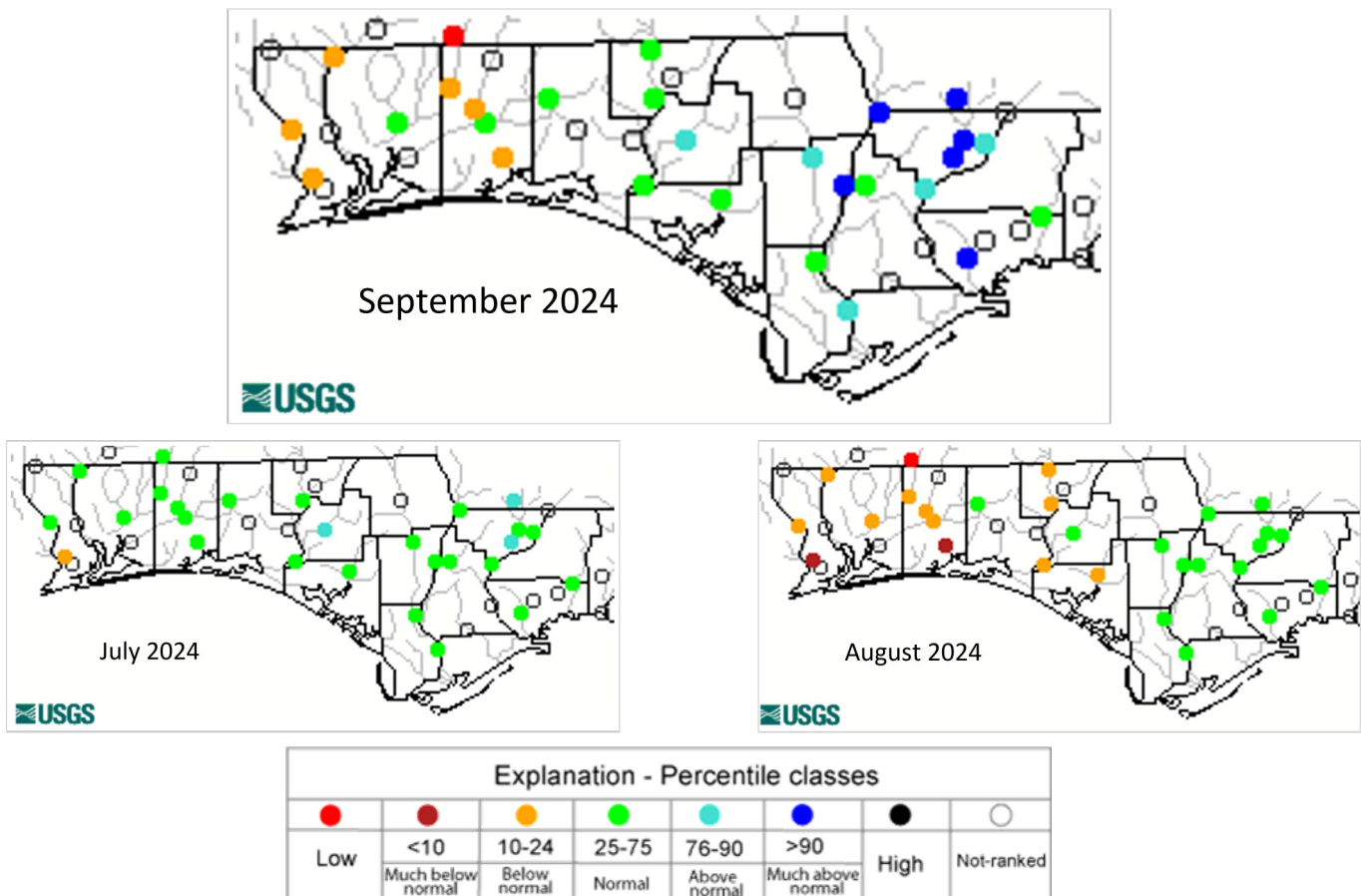
Source: <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?FL>



Surface Water

Streamflows. Decreased Increased rainfall amounts throughout September 2024 across much of the District (Figures 1 & 2) contributed generally to an increase in streamflow percentiles compared to August 2024 (Figures 9 – 15). Stations located in areas under abnormally dry conditions (Figure 8) including stations in Escambia, Santa Rosa, and Okaloosa Counties generally continued to have flow percentiles classified as below normal, though there was some improvement at some stations compared to August 2024. Stations near the Gulf Coast that were previously classified as much below normal increased to below normal and stations in central Santa Rosa and Okaloosa Counties increased into normal ranges during September 2024. Stations towards the eastern portion of the District also saw an increase in flow from the previous month. Generally, stations previously classified as below normal or normal in the eastern portion of the District recorded increased flow over the month of September 2024 to be classified as normal, above normal, or much above normal. Stations in this region that were affected by the heavy rains resulting from Hurricane Helene recorded a large spike in streamflow during and immediately after the event including the St. Marks River near Newport (Figure 10), the Ochlockonee River near Havana (Figure 11), and the Apalachicola River near Blountstown (Figure 12).

Figure 9: Northwest Florida July 2024 to September 2024 monthly streamflow percentiles



Source: <http://waterwatch.usgs.gov/index.php>



Figure 10: Daily streamflows and percentile ranges for USGS station 02326900 St. Marks River Near Newport, Florida

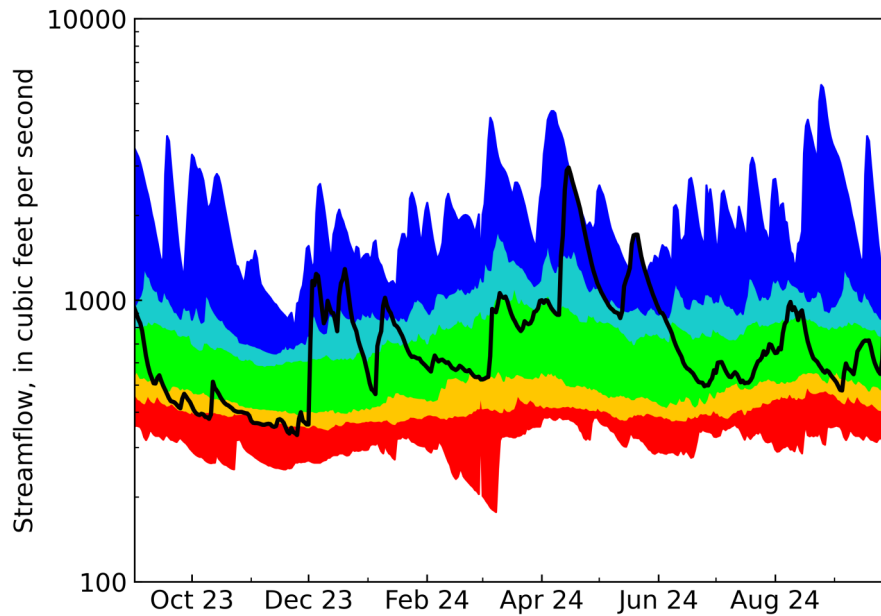
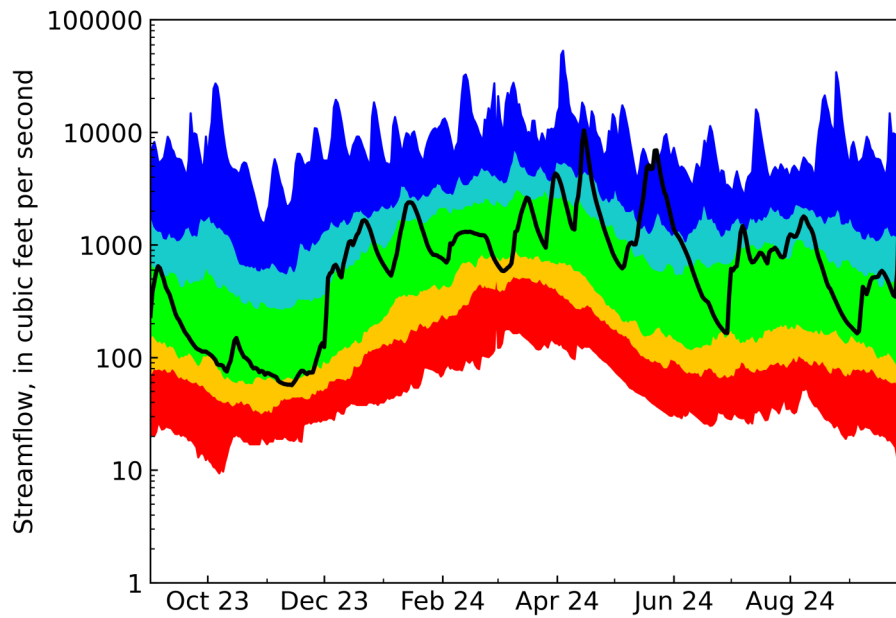


Figure 11: Daily streamflows and percentile ranges for USGS Station 02329000 Ochlockonee River Near Havana, Florida



| Explanation - Percentile classes | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|
| < 10 | 10-24 | 25-75 | 76-90 | > 90 |
| Much below normal | Below normal | Normal | Above normal | Much above normal |



Figure 12: Daily streamflows and percentile ranges for USGS Station 02358700 Apalachicola River Near Blountstown, Florida

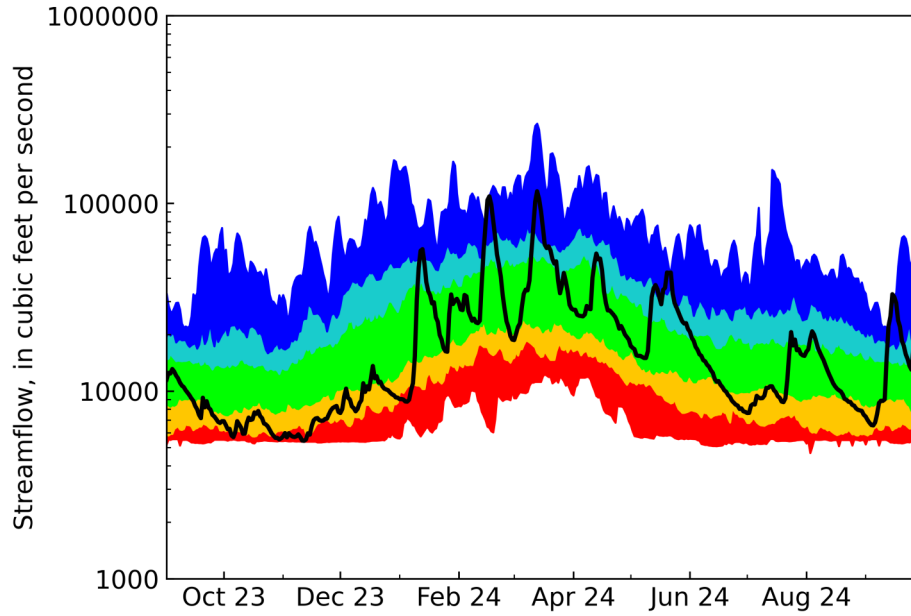
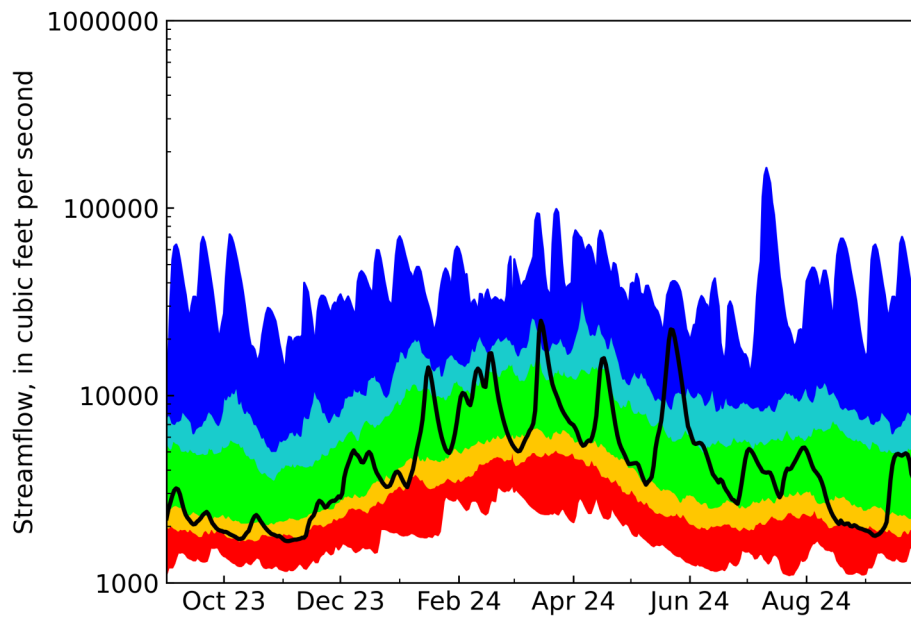


Figure 13: Daily streamflows and percentile ranges for USGS Station 02366500 Choctawhatchee River Near Bruce, Florida



| Explanation - Percentile classes | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|
| < 10 | 10-24 | 25-75 | 76-90 | > 90 |
| Much below normal | Below normal | Normal | Above normal | Much above normal |



Figure 14: Daily streamflows and percentile ranges for USGS Station 02370000 Blackwater River Near Baker, Florida

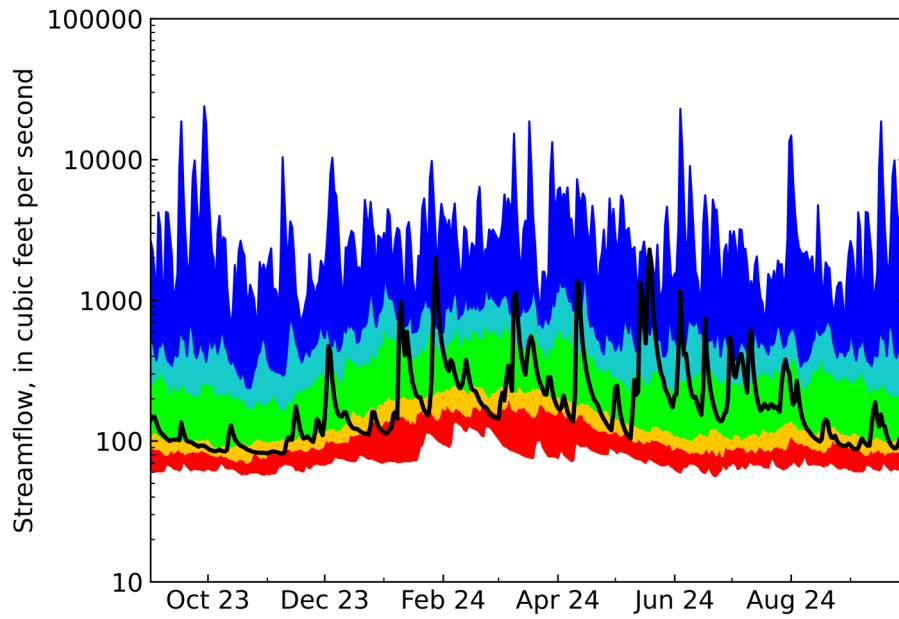
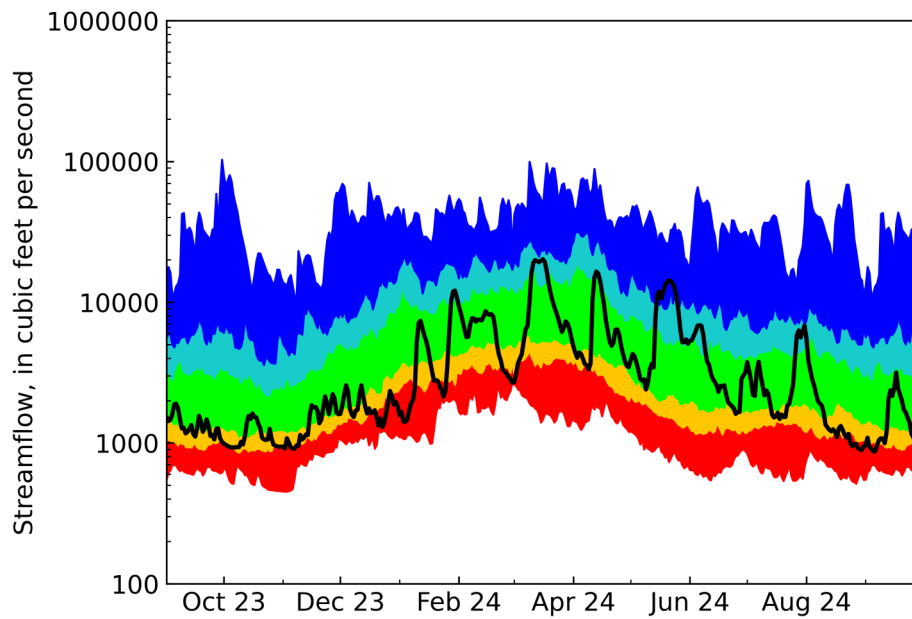


Figure 15: Daily streamflows and percentile ranges for USGS Station 02375500 Escambia River Near Century, Florida



| Explanation - Percentile classes | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|
| < 10 | 10-24 | 25-75 | 76-90 | > 90 |
| Much below normal | Below normal | Normal | Above normal | Much above normal |



Lake Levels. Water levels at Lake Jackson in Leon County generally increased by 0.31 feet until the end of the month when Hurricane Helene pushed into the Big Bend region. The lake jumped up by 0.56 feet as a result of the rain received from Hurricane Helene, ending the month with a stage level of 82.13 feet, NAVD 1988 (**Figure 16**). The long-term (January 29, 2003 to September 30, 2024) average stage level for Lake Jackson is 80.88 feet, NAVD 1988, and the full pool level is 85.74 feet, NAVD 1988.

Water levels at Piney Lake in southern Washington County continued to decrease into the start of September 2024 but two heavy rain events, one in the middle of the month and one resulting from Hurricane Helene, increased the lake level by 0.69 feet in total by the end of the month (**Figure 17**). Piney Lake ended the month with a stage level of 49.57 feet, NAVD 1988.

Figure 16: Daily water levels at Lake Jackson at Miller Landing, Leon County

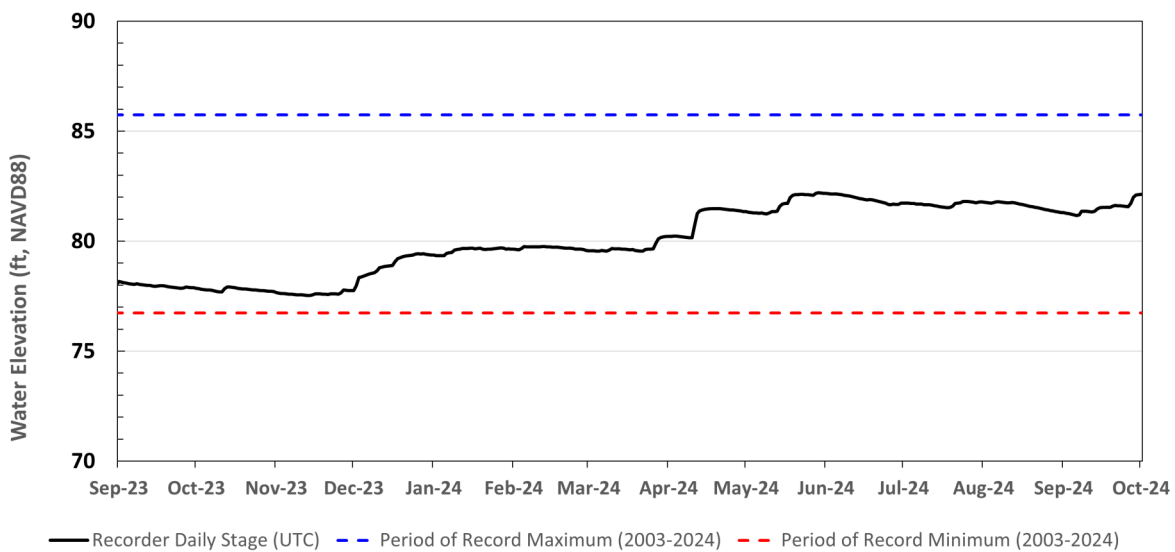
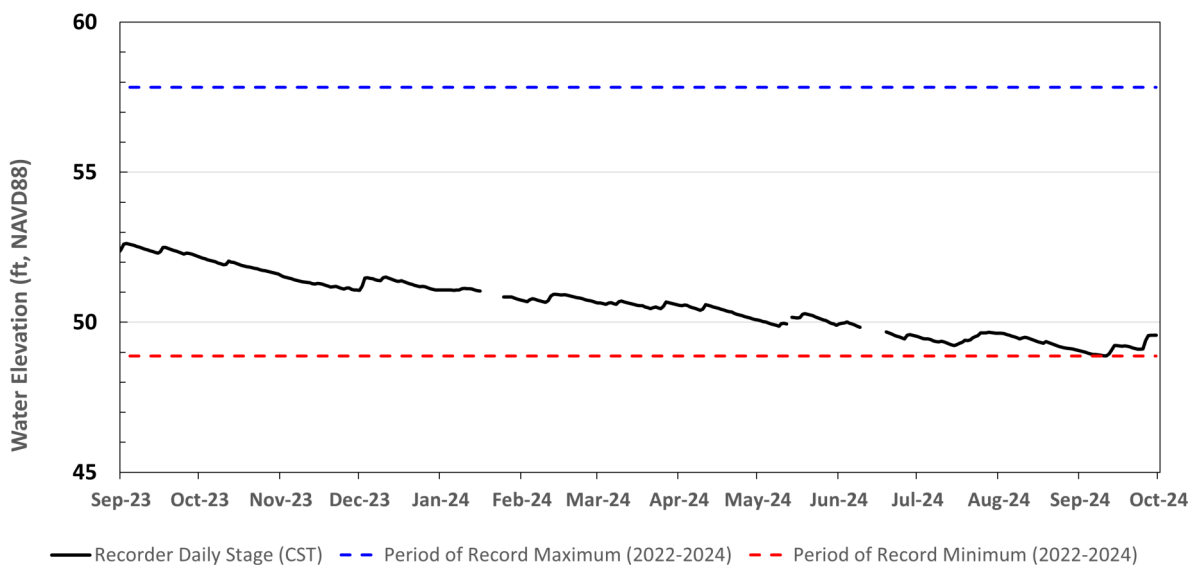


Figure 17: Daily water levels at Piney Lake, Washington County



Spring Flows

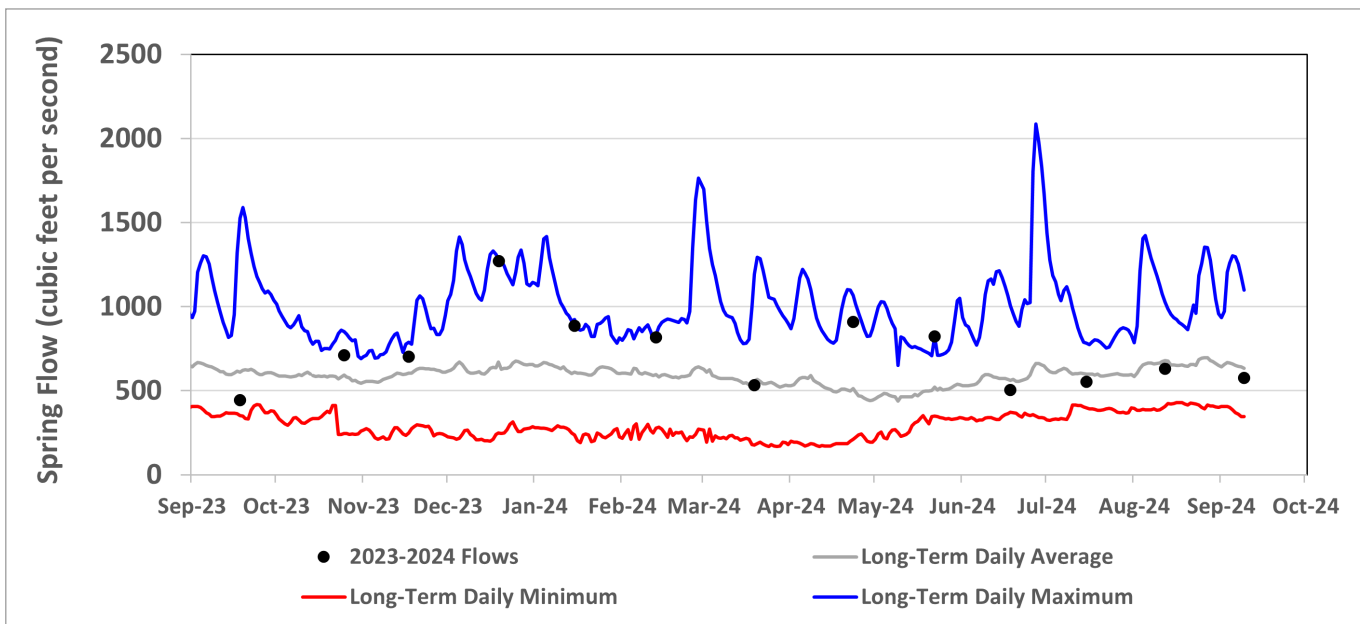
Wakulla and Sally Ward Spring System. Flows at Wakulla Spring decreased slightly, continuing to remain below the long-term average flow during September 2024. The most recent flow measurement for Wakulla Spring was 575 cubic feet per second (cfs), which was conducted on September 9, 2024 (Figure 18). It should be noted that this measurement occurred before Hurricane Helene affected the area in late September, so flows may be higher than reported above towards the end of the month. The long-term (November 2004 to September 2024) average flow for the month of September is 622 cfs.

Flow at Sally Ward Spring decreased by 2.2 cfs between the measurements taken in August and September. The most recent flow measurement for Sally Ward was 22.9 cfs on September 9, 2024. The September average Sally Ward Spring flow, based on the November 1, 2004, to September 9, 2024, period of record, is 24.8 cfs. It should be noted that this measurement occurred before Hurricane Helene affected the area in late September, so flows may be higher than reported above towards the end of the month.

The Minimum Flow established for the combined Wakulla and Sally Ward Spring System under Florida Administrative Code chapter 40A-8.041 continues to be met. The long-term (October 23, 2004, through September 9, 2024) average flows for Wakulla and Sally Ward Springs are 588 cfs and 24.2 cfs, respectively. The combined long-term spring flow for both systems is 612 cfs, which exceeds the established Minimum Flow of 539 cfs by 73 cfs.

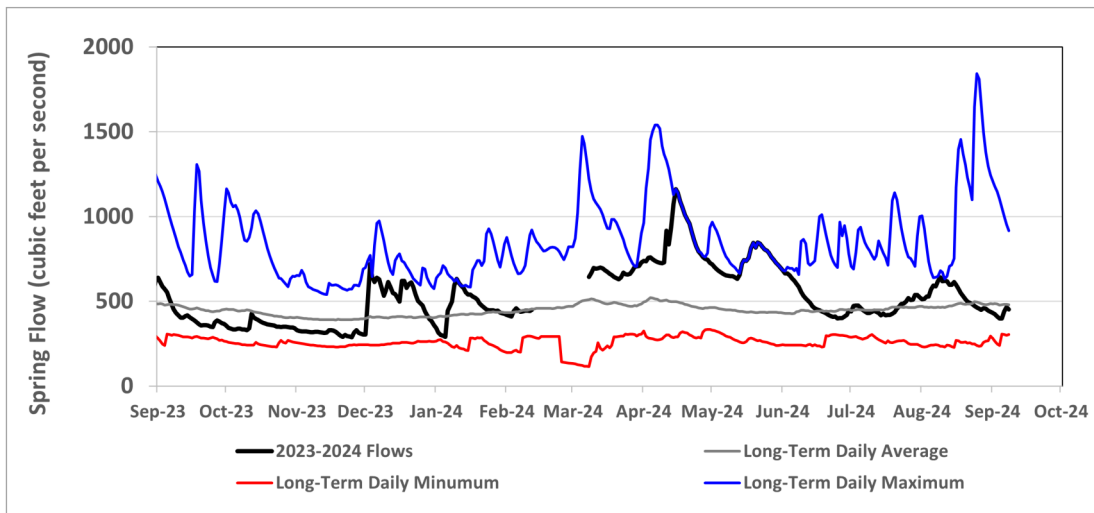
Figure 18: Daily Wakulla Spring flows

Data from September 1, 2023, through September 30, 2024, represent discrete measurements. Daily statistics are based on the October 23, 2004, through September 9, 2024, period of record.



St. Marks River Rise. The mean daily spring flow for September 2024 at the St. Marks River Rise was 649 cfs, based on the available USGS provisional data which extends through September 30, 2024 (Figure 19). The current 30-year moving average spring flow for the St. Marks River Rise based on the most recent approved USGS data (November 15, 1993, through November 14, 2023) is 429 cfs. If the provisional data from November 15, 2023, through September 30, 2024, are included, the 30-year moving average spring flow for the St. Marks River Rise is 427 cfs. The established Minimum Flow for the St. Marks River Rise is 419 cfs. Whether using the approved or provisional data, the 30-year moving average flow exceeded the established Minimum Flow for the St. Marks River Rise by 10 cfs and 8 cfs, respectively.

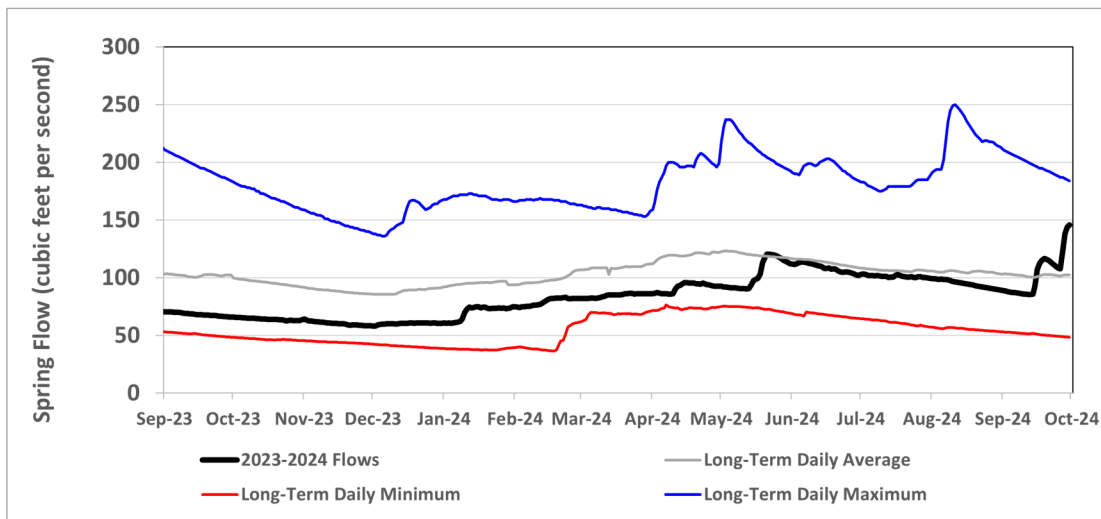
Figure 19: Daily spring flows for the St. Marks River Rise



Jackson Blue Spring. Daily average flows at Jackson Blue Spring for the month of September 2024 averaged 103 cfs, which is slightly above the September monthly average of 102 cfs (Figure 20). The spike in spring flow toward the conclusion of the month was a result of rainfall received from Hurricane Helene.

Figure 20: Daily spring flows for Jackson Blue Spring

Data represents daily averages. Long-term flows represent the daily average between December 21, 2004, and September 30, 2024.

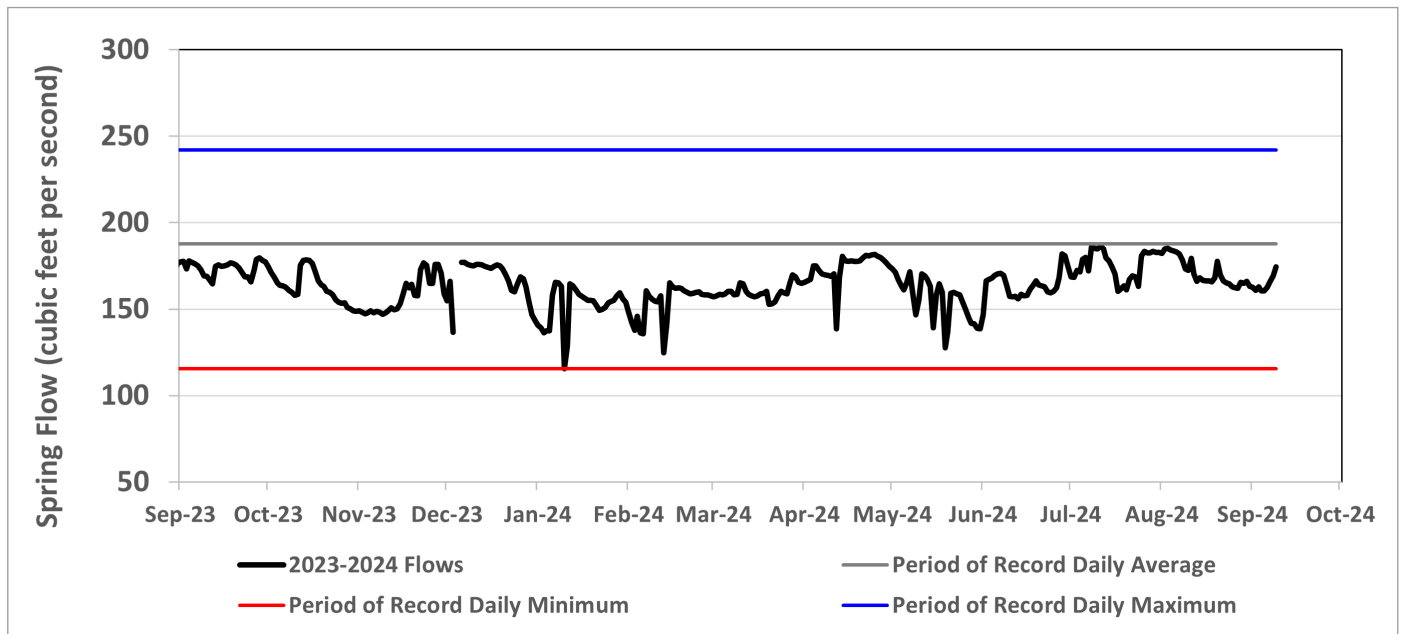


Gainer Spring Group. The average daily flow at the Gainer Spring Group was 164 cfs during September 2024 (September 1 through September 9, 2024) and represents the second lowest recorded monthly average for September for the period of continuous flow data, which extends from October 28, 2019, through September 9, 2024 (**Figure 21**). The long-term average monthly spring flow for September is 182 cfs. It should be noted that there is a relatively brief period of record for this system, and spring flows among the highest and lowest on record are to be expected.

Throughout the timeseries, there are several drops and recoveries in the spring flow. This is caused by Econfina Creek spiking in stage adjacent to the spring group after rain events. The extra pressure exerted on the groundwater by the surface water in the stream slows flow from the spring group. Since Econfina Creek does not tend to stay high for long after the conclusion of a rain event, as the stage level quickly drops, the flow from the spring group recovers since there is less pressure from the stream.

Figure 21: Gainer Spring Group flows

Data represents daily averages. Streamflow statistics are not shown due to the relatively short period of daily data.



Aquifer Levels

Classifications of Floridan aquifer monitor wells were within normal ranges in the eastern portion of the District while Floridan monitor wells to the west recorded generally below normal levels in the middle of September 2024 (Figures 22 - 27). The contrast in Floridan aquifer levels between the western and eastern portion of the District is due to the difference in rain amounts received between the two regions (Figure 1), with the western region also continuing to have drier conditions (Figure 8). In central Bay County, water levels at Fannin Airport monitor well (NWFID 697) increased from much below normal to end the month within normal ranges for the first time since May 2024 (Figure 27). This was due in part to the rain received from Hurricane Helene at the end of September 2024 where a sudden spike in the data can be seen. A similar spike in groundwater level could also be seen at Benchmark monitor well (NWFID 392) in central Wakulla County (Figure 24) and Pittman VISA monitor well (NWFID 5266) in northeastern Jackson County (Figure 26), also as a result of precipitation received from Hurricane Helene.

All sand-and-gravel aquifer wells depicted recorded below normal ranges except for NFWFMD-Weller Ave Deep monitor well (NWFID 1382) in southern Escambia County, which has remained within normal ranges for the majority of 2024 (Figures 22 & 28).

Figure 22: Floridan aquifer monitor wells and aquifer level percentiles for August 2024

Percentile class rankings are based on each well's period of record. All wells have a minimum of 20 years of data.

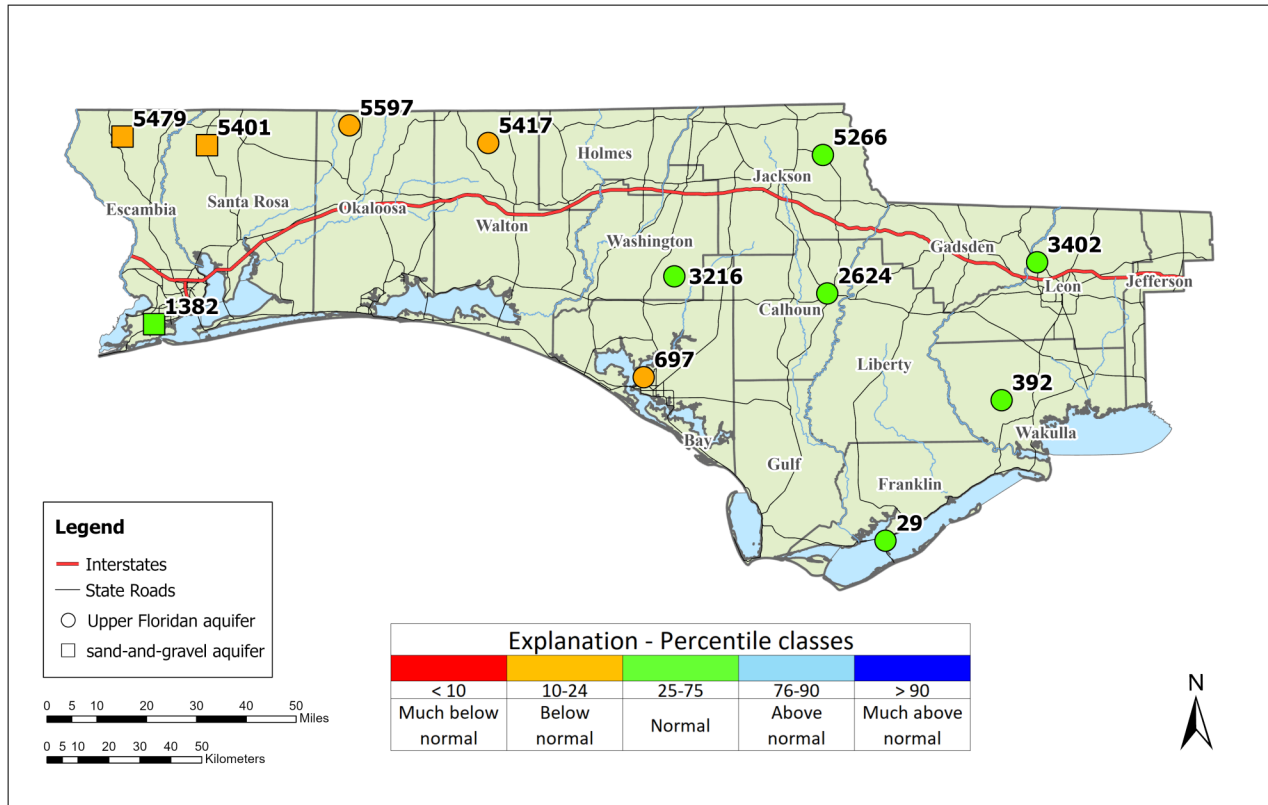


Figure 23: Daily Upper Floridan aquifer levels at USGS-Lake Jackson well (NWFID 3402), Leon County

Land surface elevation is 121.40 ft, NAVD 88

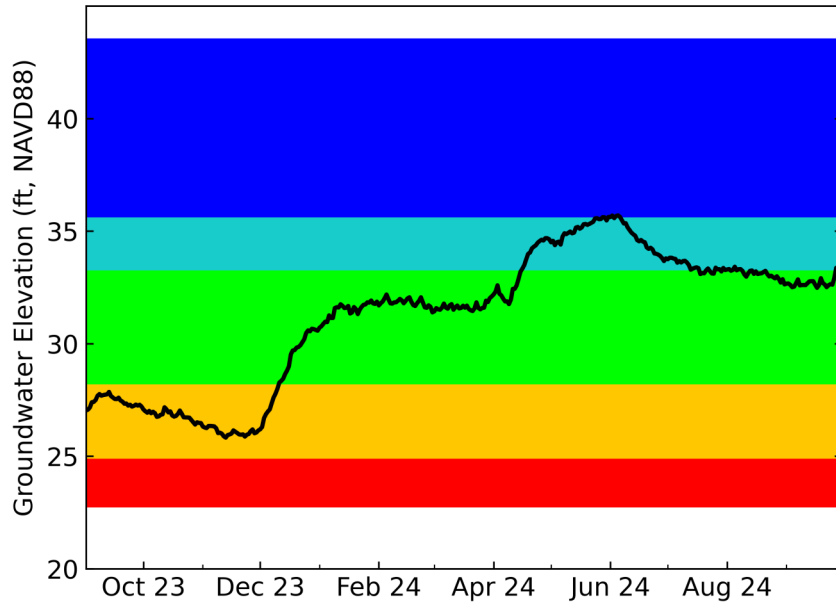
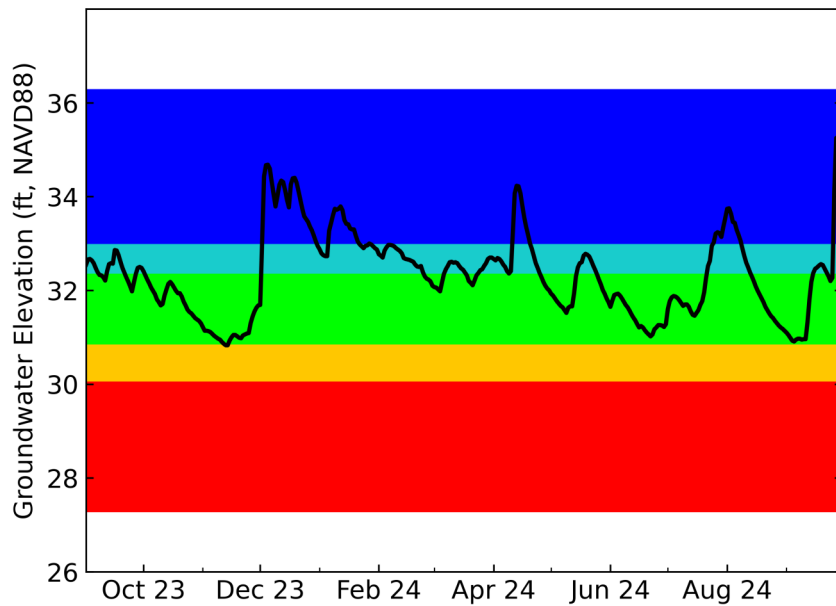


Figure 24: Daily Upper Floridan aquifer levels at USGS Benchmark well (NWFID 392), Wakulla County

Land surface elevation is 46.27 ft, NAVD 88



| Explanation - Percentile classes | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|
| < 10 | 10-24 | 25-75 | 76-90 | > 90 |
| Much below normal | Below normal | Normal | Above normal | Much above normal |



Figure 25: Daily Upper Floridan aquifer levels at NFWMD Pittman Visa well (NWFID 5266), Jackson County

Land surface elevation is 127.31 ft, NAVD 88

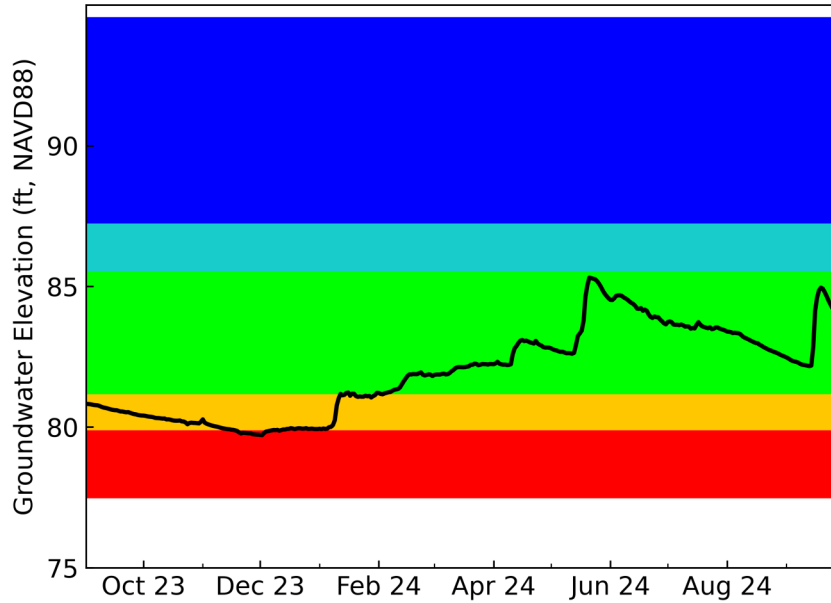


Figure 26: Daily Upper Floridan aquifer levels at USGS-422A Near Greenhead well (NWFID 3216), Washington County

Land surface elevation is 66.75 ft, NAVD 88

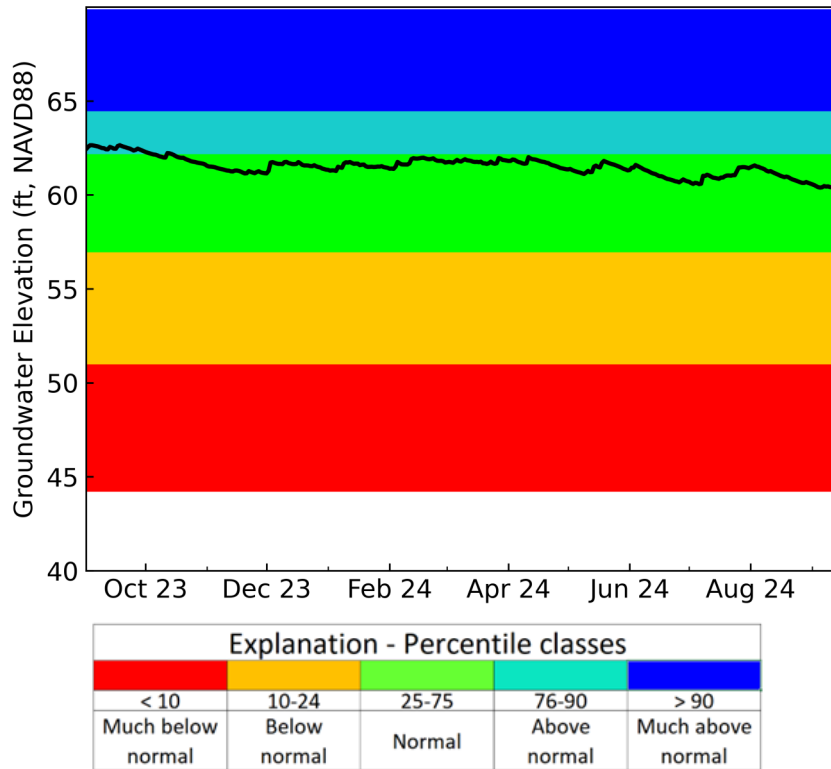


Figure 27: Daily Upper Floridan aquifer levels at Fannin Airport well (NWFID 697), Washington County

Land surface elevation is 4.05 ft, NAVD 88

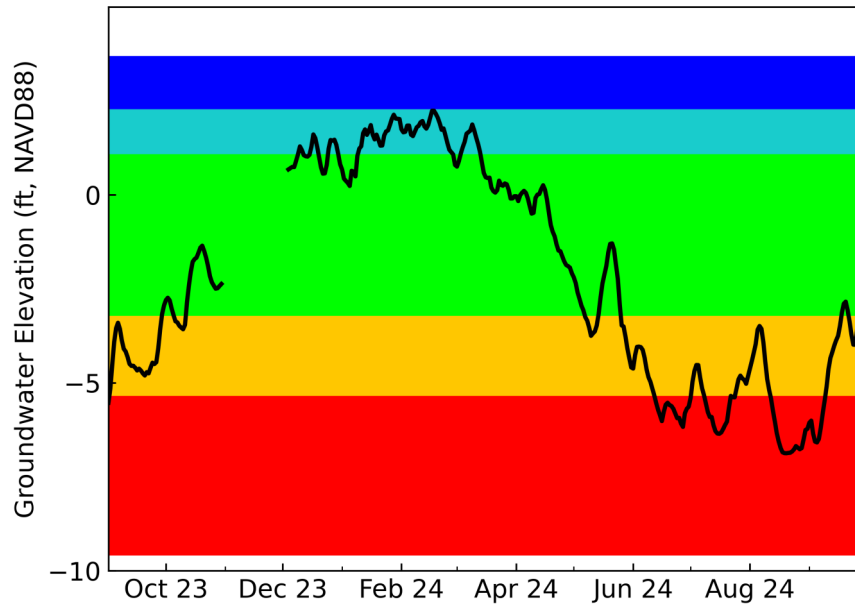
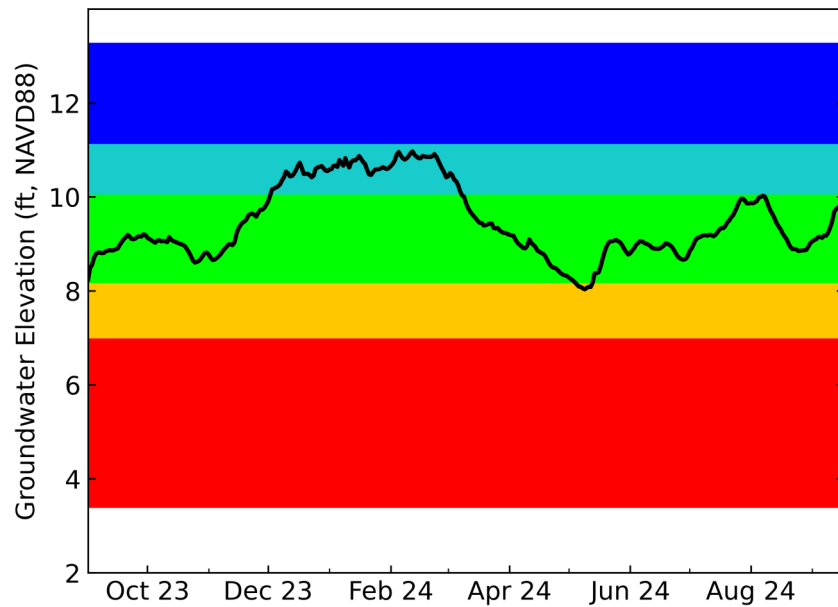


Figure 28: Daily sand-and-gravel aquifer levels at NFWFMD Weller Ave Deep well (NWFID 1382), Escambia County

Land surface elevation is 25.09 ft, NAVD 88



| Explanation - Percentile classes | | | | |
|----------------------------------|--------------|--------|--------------|-------------------|
| < 10 | 10-24 | 25-75 | 76-90 | > 90 |
| Much below normal | Below normal | Normal | Above normal | Much above normal |

