Drought Indicators Report

Georgia Environmental Protection Division

February 2025

Background

Pursuant to the Rules for Drought Management, <u>Section 391-3-3-.04 Drought</u> <u>Indicators and Triggers</u>, the Director of EPD monitors climatic indicators and water supply conditions to assess drought occurrence and severity, and its impact upon the ability of public water systems to provide adequate supplies of water. These indicators and conditions January include, but not be limited, to the following:

- U.S. Drought Monitor;
- Precipitation;
- Streamflow;
- Groundwater;
- Reservoir levels;
- Short term climate predictions;
- Soil moisture; and
- Water supply conditions.

Background

- The Rules require EPD to report on current climatic indicators at least semi-annually or monthly when any part of the state has experienced at least two consecutive months of severe drought.
- This reports compare current conditions to historical levels (and/or reservoir rule curves) for each of the following indicators:
 - Precipitation during the prior 3, 6, and 12 months;
 - Streamflow at the select United States Geological Survey gages;
 - Groundwater levels at select United States Geological Survey monitoring wells; and
 - Reservoir levels at Allatoona Lake, Lake Hartwell, Clarks Hill Lake, and Lake Lanier.
- The following sections of this presentation provide the data and information sources analyzed by EPD in developing this drought indicators report for conditions as of February 10, 2025.

Drought Indicator Analysis Summary (slide 1 of 2)

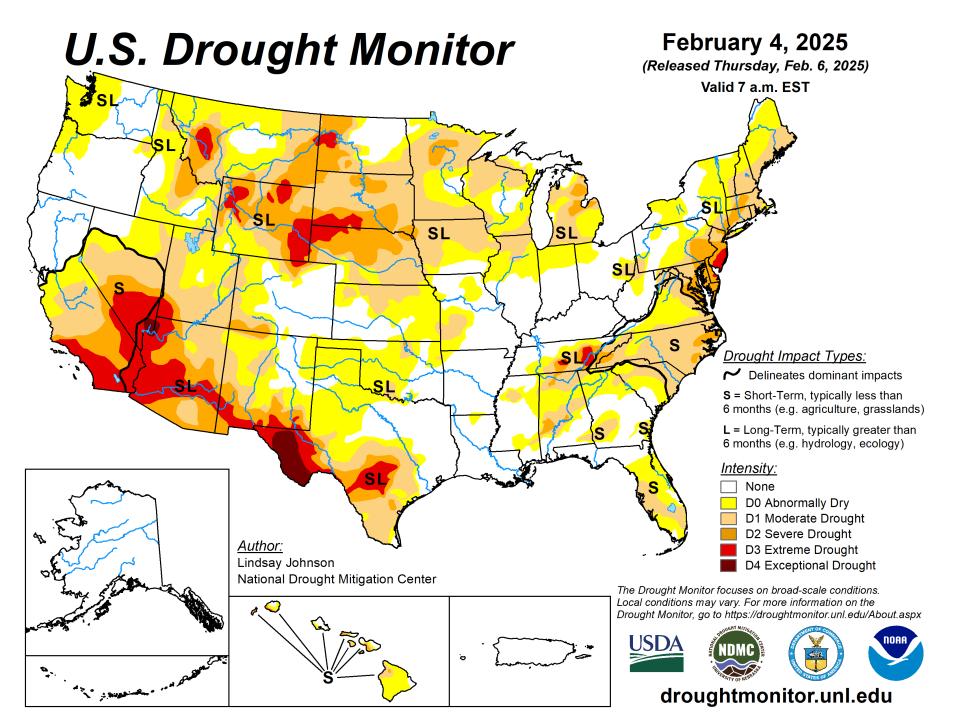
- U.S. Drought Monitor Abnormally Dry (D0, the least intense level) exists in areas above the Fall Line, southwest GA and coastal GA. Moderate drought (D1) exists in multiple counties in north GA, southwest GA and southeast GA. Severe drought exists in some area of three counties (Dade, Walker and Catoosa).
- Precipitation Three-month precipitation is below normal in most area except Lower Savannah Basin. Six-month precipitation is below normal in northern bordering counties, Tallapoosa, and Upper Chattahoochee and Upper Savannah Basins. Twelve-month precipitation is below normal in some areas above Fall Line.
- Soil Moisture Soil moisture conditions are below normal in Southeast part of Georgia.

Drought Indicator Analysis Summary (slide 2 of 2)

- Streamflow Stream flows at five selected USGS gages (5 out of 34) are near or above normal. Half of selected gages are between the lowest 20th percentile and median. Nine gages are between the lowest 20th and 10th percentiles. Three gages (in Tennessee, Oconee and Savannah Basins) are between the lowest 10th and 5th percentiles.
- Groundwater Level Groundwater levels are above or near normal in five selected wells (5 out of 17). Nine well levels are between the lowest 20th percentile and median. One well level is between the lowest 20th and 10th percentiles (Valley and Ridge Aquifer in Tennessee Basin). Another well level is below 5th percentile (Crystalline Rocks Aquifer in Chattahoochee Basin). One well data is missing.
- Reservoir Levels At the end of January, Carters, Lanier, Hartwell and Thurmond are in zone 1. Other Federal Reservoirs' levels are above or near their respective top of conservation (normal) pools. ACF composite storage is in zone 1.
- Short-term Climate Prediction National Climatic Prediction Center projects above normal temperature statewide and below normal precipitation in most areas in February-April 2025. U.S. Drought Outlook predicts drought persist in Flint Basin and drought development likely in South GA in February- April 2025.
- Water Supplies No issues with water availability to water supply providers were reported.

US Drought Monitor

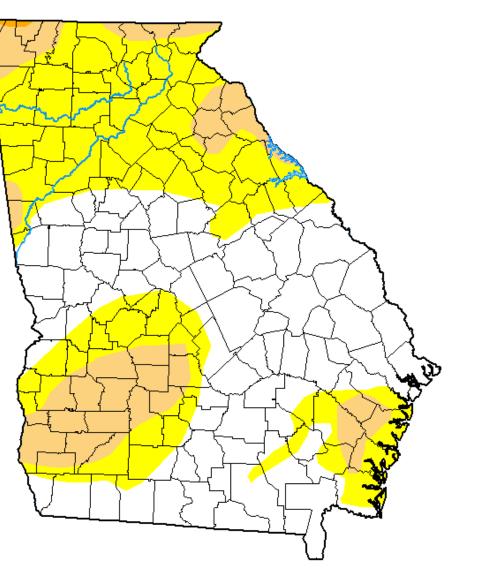
Data Source: http://droughtmonitor.unl.edu/



U.S. Drought Monitor Georgia

February 4, 2025 (Released Thursday, Feb. 6, 2025) Valid 7 a.m. EST

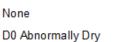
Drought Conditions (Percent Area)



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	48.28	51.72	14.93	0. 11	0.00	0.00
Last Week 01-28-2025	65.40	34.60	<mark>9.3</mark> 3	0.00	0.00	0.00
3 Month s Ago 11-05-2024	5.04	94.96	5.08	0.00	0.00	0.00
Start of Calendar Year 01-07-2025	56.32	43.68	11.40	0.00	0.00	0.00
Start of Water Year 10-01-2024	98.35	1.65	0.00	0.00	0.00	0.00
One Year Ago 02-06-2024	92.19	7.81	1.31	0.00	0.00	0.00

Intensity:

None





D1 Moderate Drought

D3 Extreme Drought

D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

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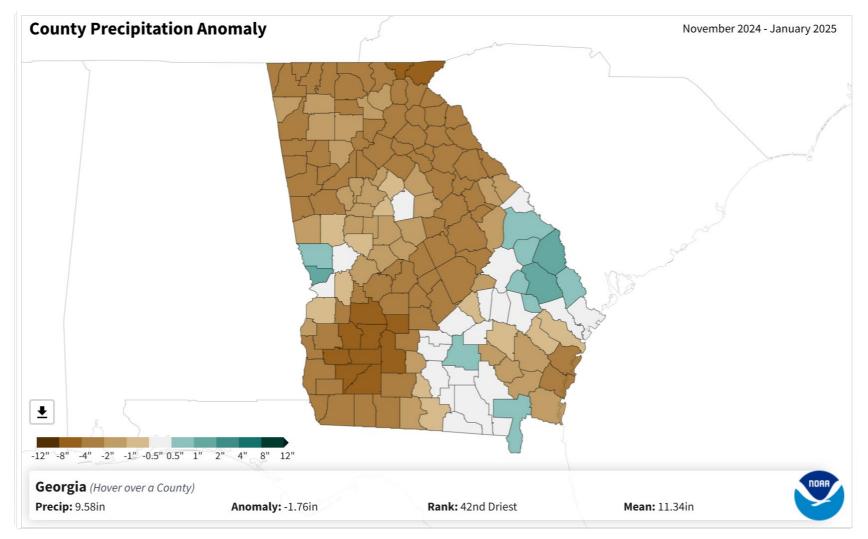


droughtmonitor.unl.edu

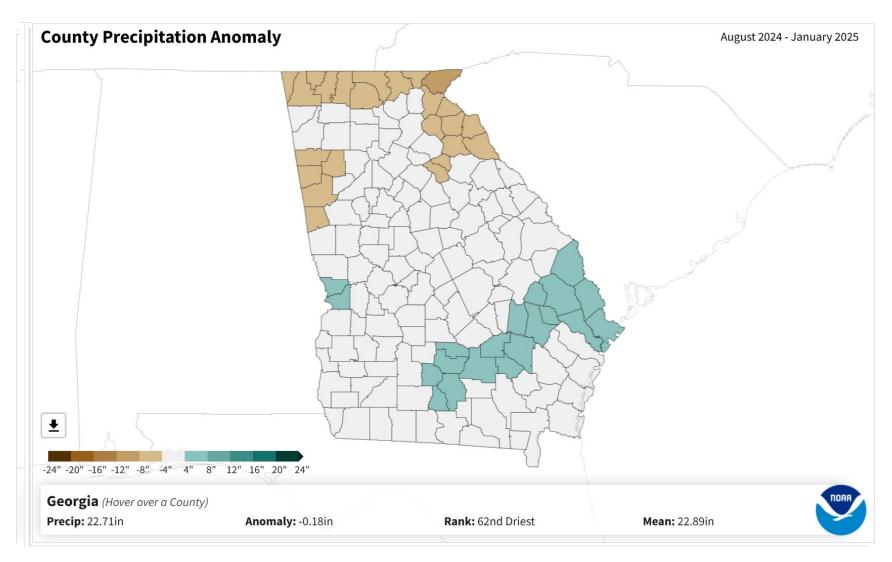
3, 6, and 12 Month Precipitation Anomaly

Data Source: https://www.ncdc.noaa.gov/cag/county/mapping/

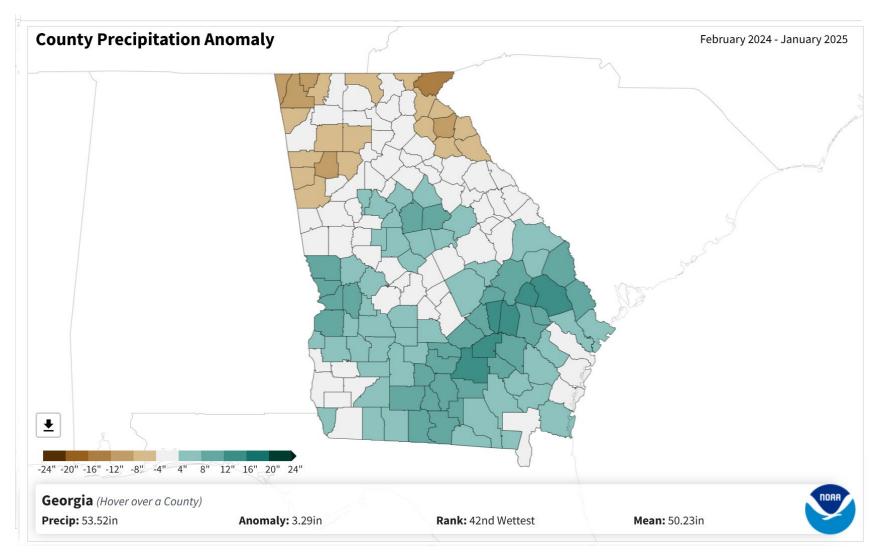
3 Month Precipitation Anomaly



6 Month Precipitation Anomaly

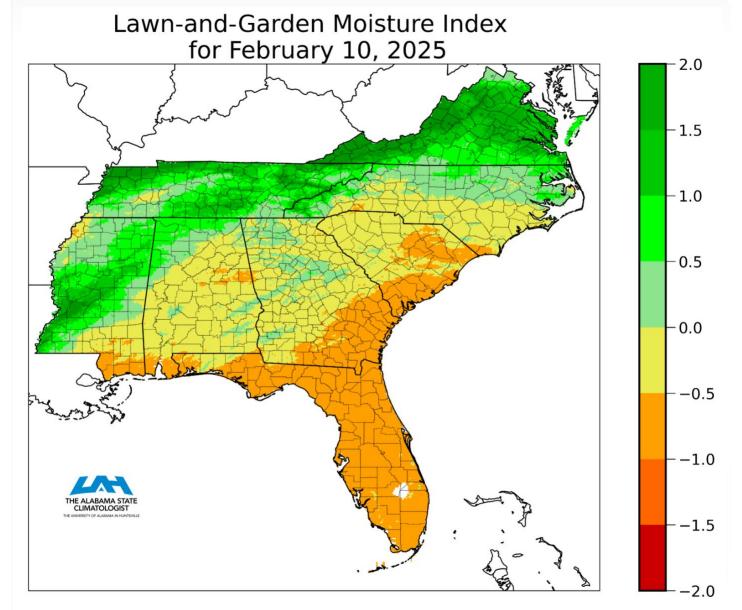


12 Month Precipitation Anomaly



Soil Moisture Conditions

Data Source: http://www.hydro.ucla.edu/SurfaceWaterGroup/forecast/moni tor/curr/conus.mexico/east.vic.sm_qnt.gif



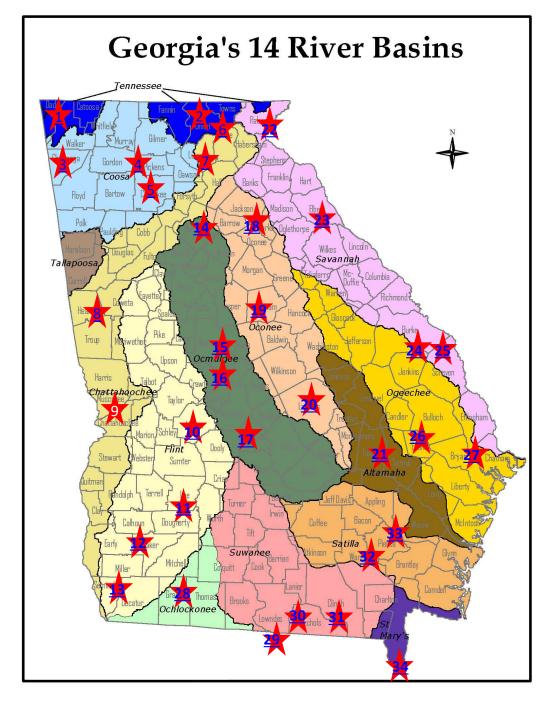
Current (Daily updated) percentiles for soil moisture (SWE) with respect to the climatological period (1916-2004).

Streamflow Conditions

Data Source: USGS

Streamflow Monitoring

- As shown on the following slide, EPD Monitors 34 USGS stream gages in 13 of the State's major river basins to assess drought conditions.
- These gages were selected because each has:
 - Long-term and relatively complete records for recent decades; and
 - Relatively low consumptive water use implications and streamflows are not heavily influenced by dams.
- Note: Hydrologic conditions of major rivers with streamflows that are heavily influenced by dams can be assessed by reviewing status of major storage reservoirs



USGS Stream Gages Monitored by EPD to Assess Drought Conditions

GAGE#	BASIN	GAGE NAME
1	TENNESSEE	LOOKOUT CREEK NEAR NEW ENGLAND
2	TENNESSEE	NOTTELY RIVER NEAR BLAIRSVILLE
3	COOSA	CHATTOOGA RIVER AT SUMMERVILLE
4	COOSA	TALKING ROCK CREEK NEAR HINTON
5	COOSA	ETOWAH RIVER AT CANTON
6	CHATTAHOOCHEE	CHATTAHOOCHEE RIVER AT CORNELIA
7	CHATTAHOOCHEE	CHESTATEE RIVER NEAR DAHLONEGA
8	CHATTAHOOCHEE	NEW RIVER AT GA 100 NEAR CORINTH
9	CHATTAHOOCHEE	UPATOI CREEK AT COLUMBUS
10	FLINT	FLINT RIVER AT GA26 NEAR MONTEZUMA
11	FLINT	FLINT RIVER AT ALBANY
12	FLINT	ICHAWAYNOCHAWAY CREEK AT MILFORD
13	FLINT	SPRING CREEK NEAR IRON CITY
14	OCMULGEE	ALCOVY RIVER ABOVE COVINGTON
15	OCMULGEE	OCMULGEE RIVER AT MACON
16	OCMULGEE	TOBESOFKEE CREEK NEAR MACON
17	OCMULGEE	TUCSAWHATCHEE CREEK NEAR
		HAWKINSVILLE
18	OCONEE	MIDDLE OCONEE RIVER NEAR ATHENS
19	OCONEE	LITTLE RIVER NEAR EATONTON
20	OCONEE	OCONEE RIVER AT DUBLIN
21	ALTAMAHA	OHOOPEE RIVER NEAR REIDSVILLE
22	SAVANNAH	CHATTOOGA RIVER NEAR CLAYTON
23	SAVANNAH	BROAD RIVER NEAR BELL
24	SAVANNAH	BEAVERDAM CREEK NEAR SARDIS
25	SAVANNAH	BRIER CREEK AT MILLHAVEN
26	OGEECHEE	CANOOCHEE RIVER NEAR CLAXTON
27	OGEECHEE	OGEECHEE RIVER NEAR EDEN
28	OCHLOCKONEE	OCHLOCKONEE RIVER NEAR THOMASVILLE
29	SUWANEE	WITHLACOOCHEE RIVER NEAR PINETTA FL
30	SUWANEE	ALAPAHA RIVER AT STATENVILLE
31	SUWANEE	SUWANNEE RIVER AT US 441, AT FARGO
32	SATILLA	SATILLA RIVER NEAR WAYCROSS
33	SATILLA	LITTLE SATILLA RIVER NEAR OFFERMAN
34	ST MARY	ST MARYS RIVER NEAR MACCLENNY FL

Streamflow Graphs

- For each of the 34 gages, EPD has prepared a graph that shows monthly average streamflow from January 2025 through January 2025;
- To help put these streamflow conditions into perspective, for comparison purposes, each graph also shows:
 - Monthly average streamflows for the years 2007 and 2011 when streamflows were at or near recorded low levels across much of the state; and
 - A statistical composite of historical conditions showing the "driest" 50, 20, 10, and 5 percent of all recorded monthly average stream flows at the same gage.

How to Read the Streamflow Graphs Example #1: Etowah River at Canton

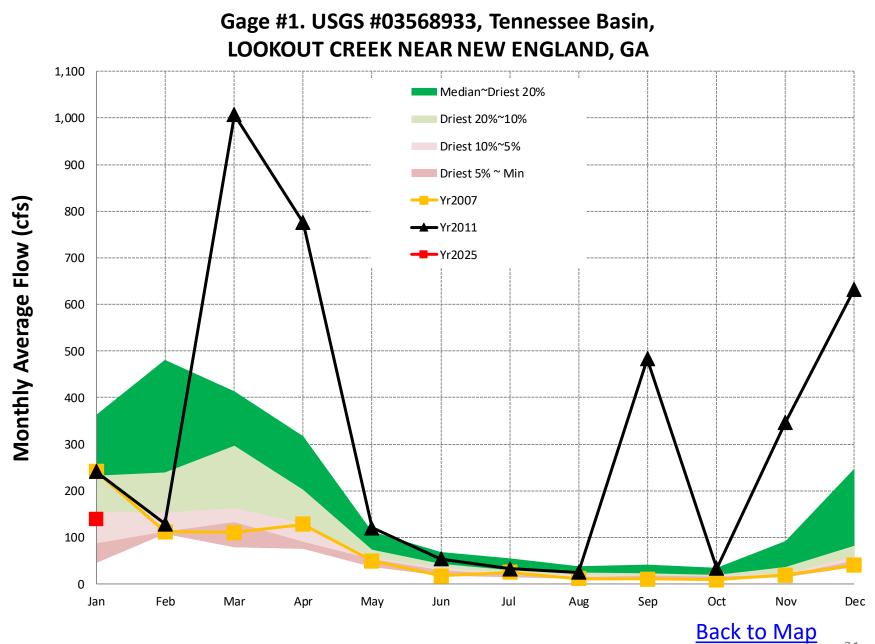
The streamflow graph for Gage #5, <u>USGS Etowah River gage at Canton</u> shows :

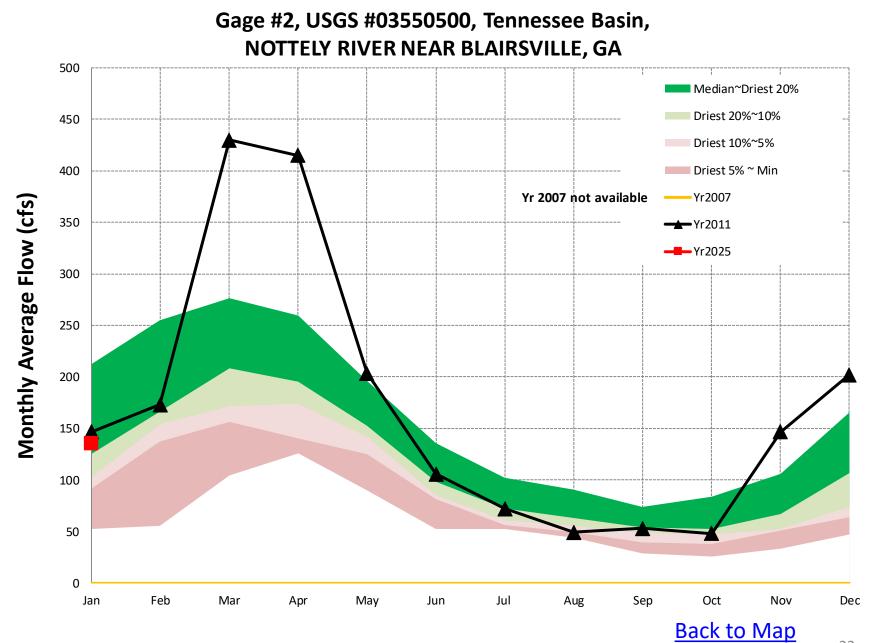
- Average stream flow in January 2025 was 1022 cfs. The statistical composite of all historical data for this gage shows that average streamflow in January has historically been lower than January 2025 about 28% of the time; 72% of the time in January it has been higher.
- Average stream flow in January 2011 was 611 cfs. The statistical composite of all historical data for this gage shows that average streamflow in January has historically been lower than January 2011 about 5% of the time; 95% of the time in January it has been higher.
- Average stream flow in January 2007 was 1596 cfs. The statistical composite of all historical data for this gage shows that average streamflow in January has historically been lower than January 2007 about 60~70 % of the time; 30~40 % of the time in January it has been higher.

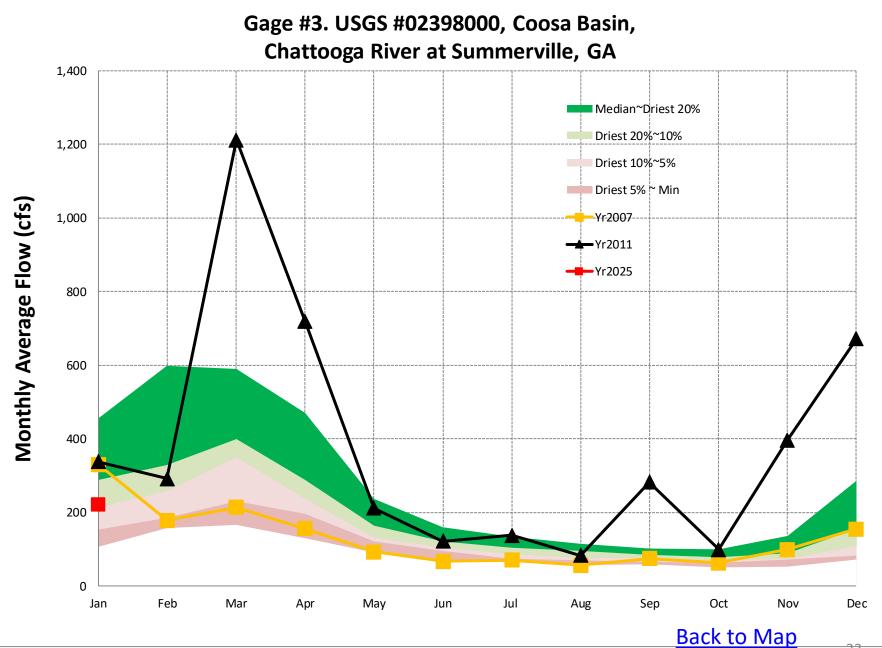
How to Read the Streamflow Graphs <u>Example #2:</u> Flint River at Albany

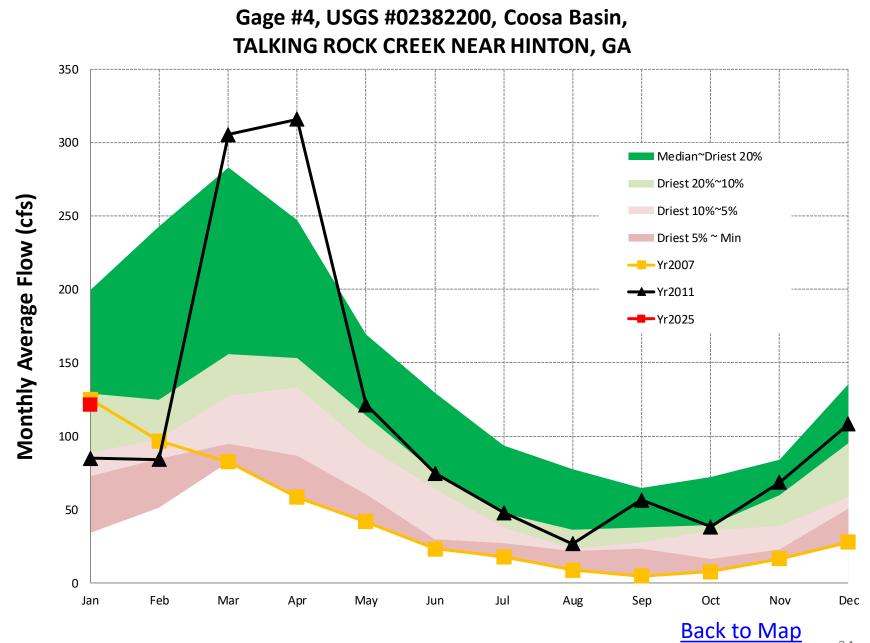
The streamflow graph for Gage #11, <u>USGS Flint River gage at Albany</u> shows:

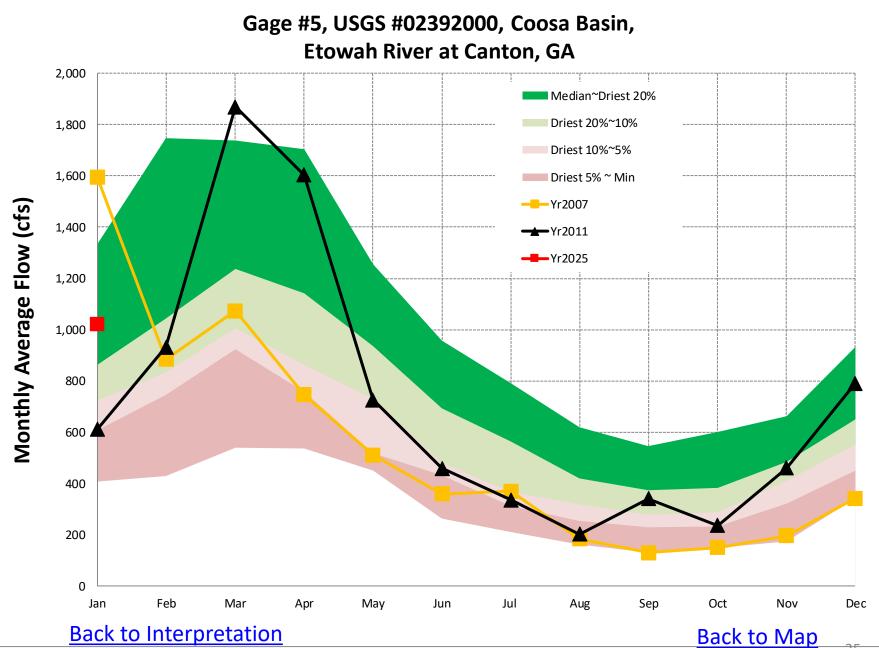
- Average stream flow in January 2025 was 4987 cfs. The statistical composite of all historical data for this gage shows that average streamflow in January has historically been lower than January 2025 about 29% of the time; about 71% of the time in January it has been higher.
- Average stream flow in January 2011 was 3207 cfs. The statistical composite of all historical data for this gage shows that average streamflow in January has historically been lower than January 2011 about 5~10 % of the time; about 90~95% of the time in January it has been higher.
- Average stream flow in January 2007 was 6215 cfs. The statistical composite of all historical data for this gage shows that average streamflow in January has historically been lower than January 2007 about 40~50% of the time; about 50~60% of the time in January it has been higher.

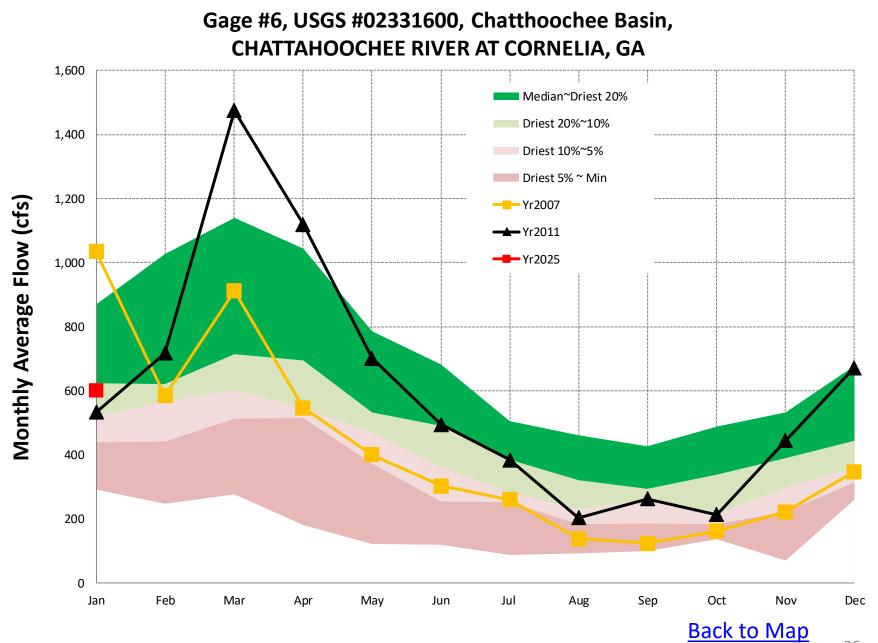


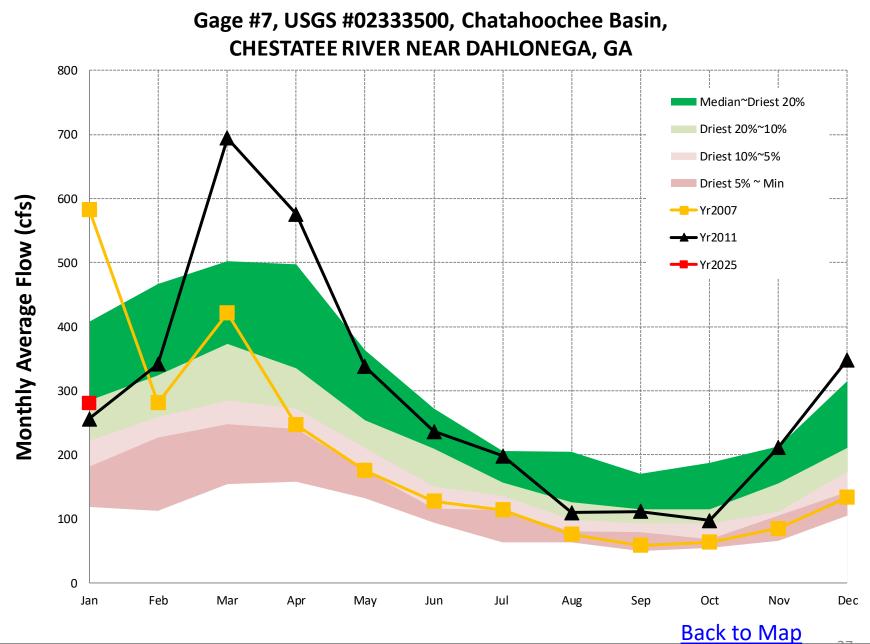


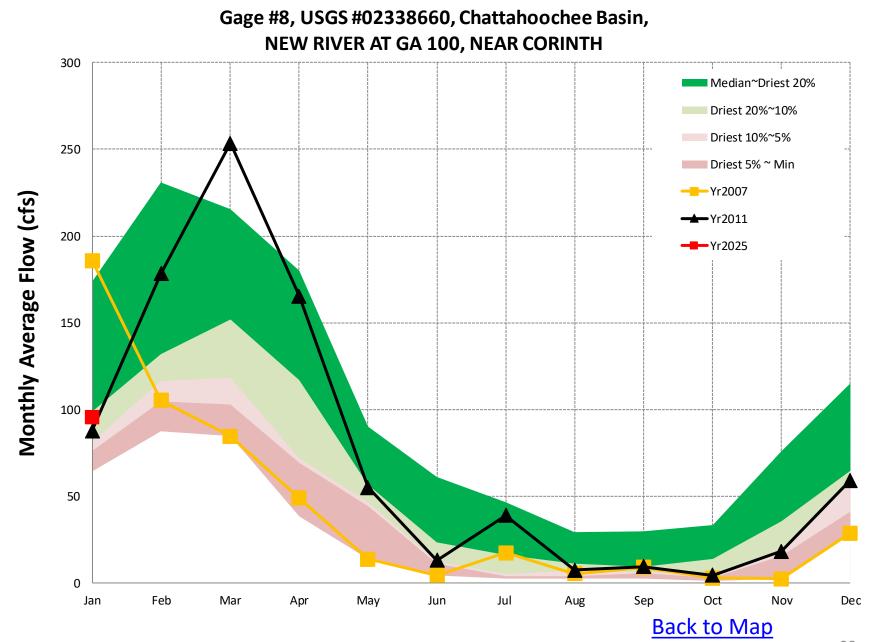


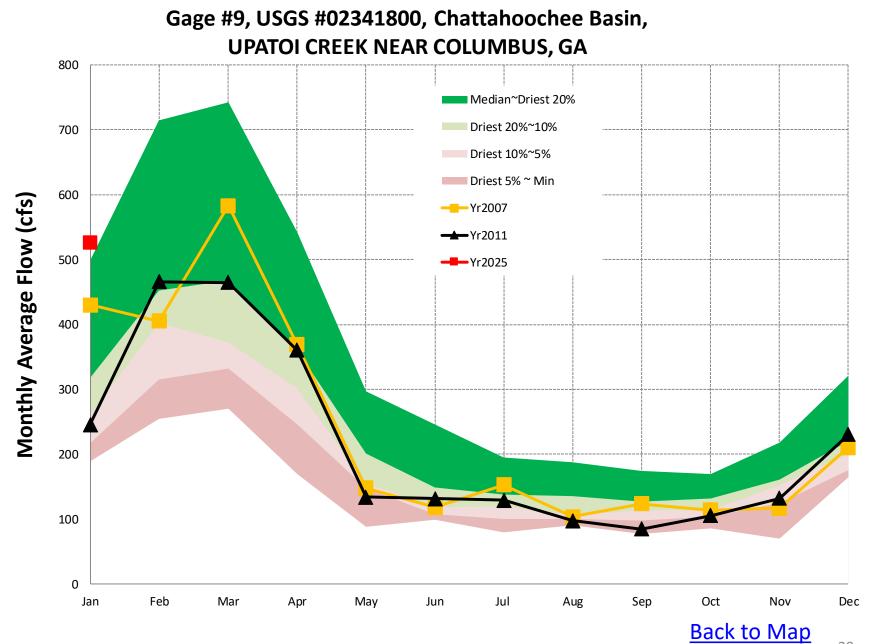


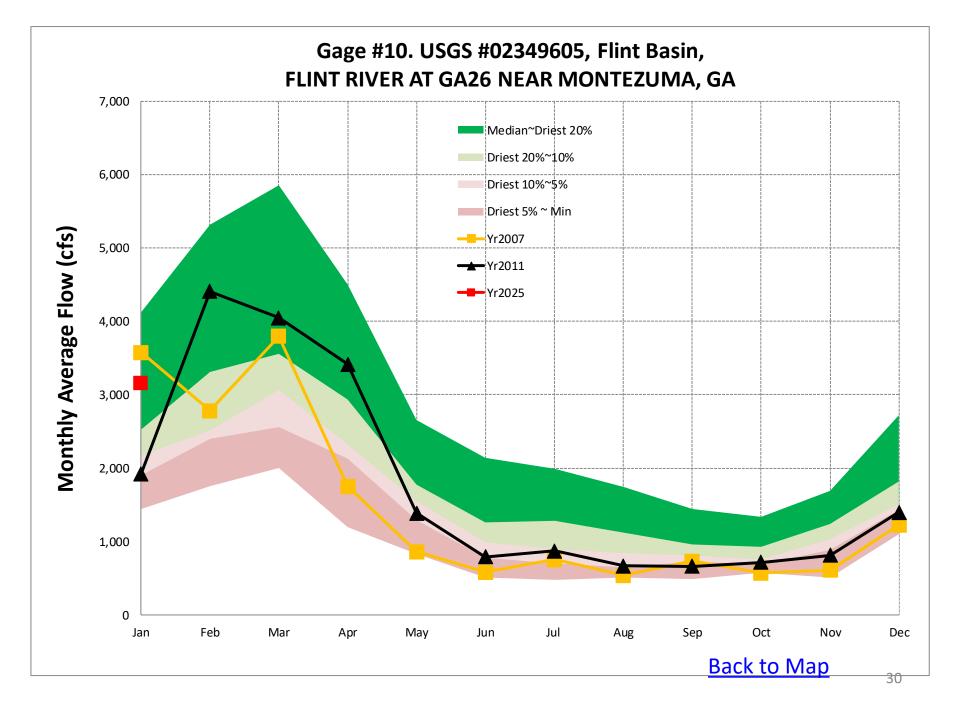


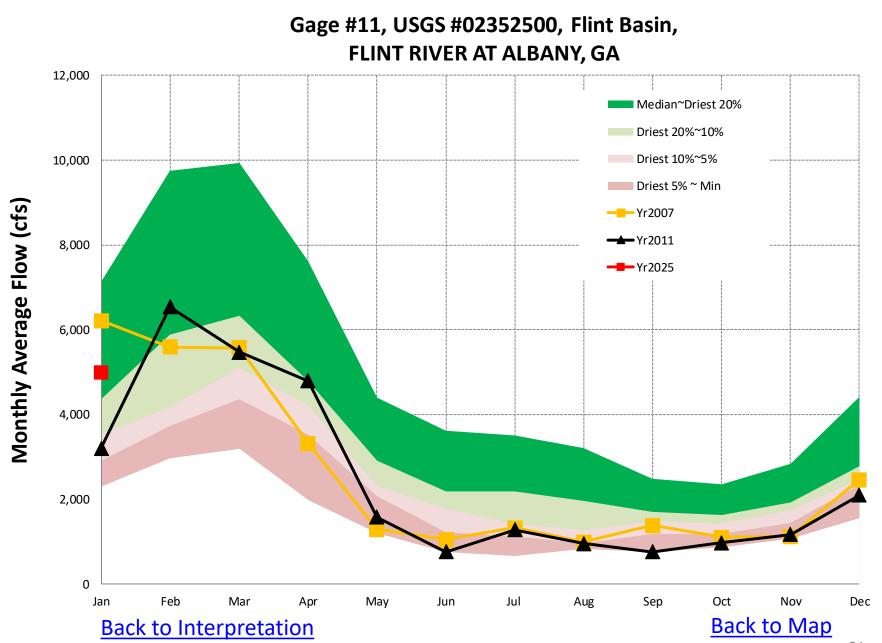


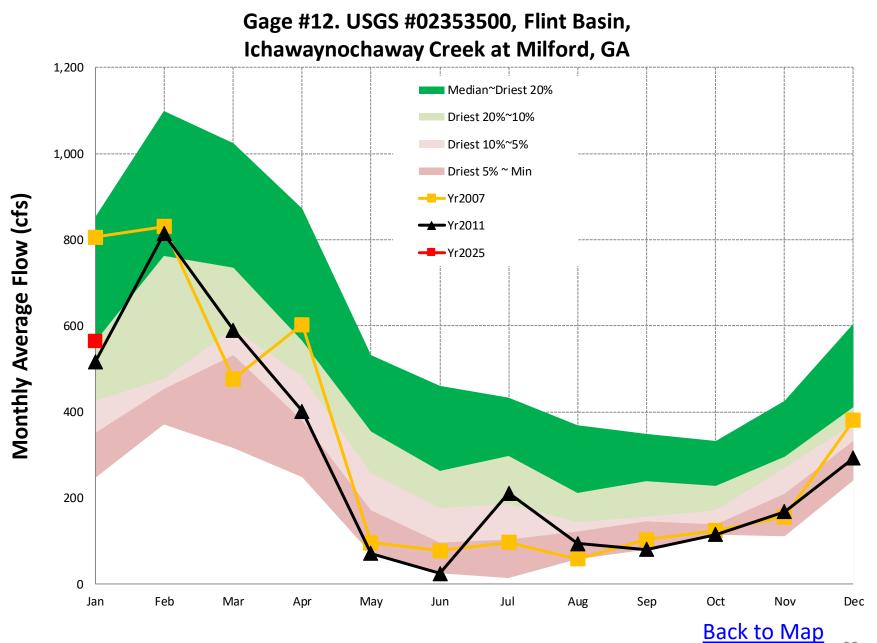


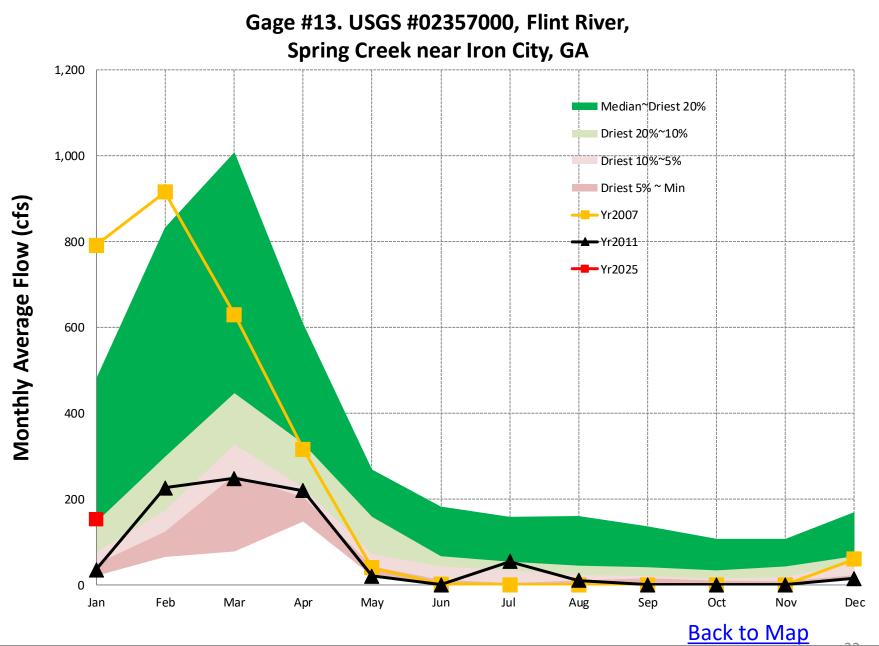


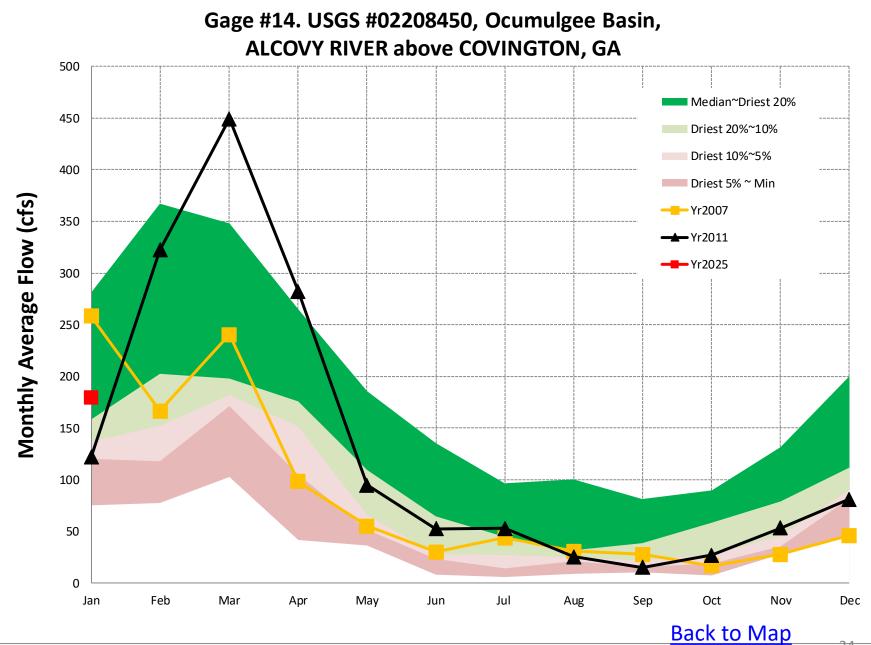


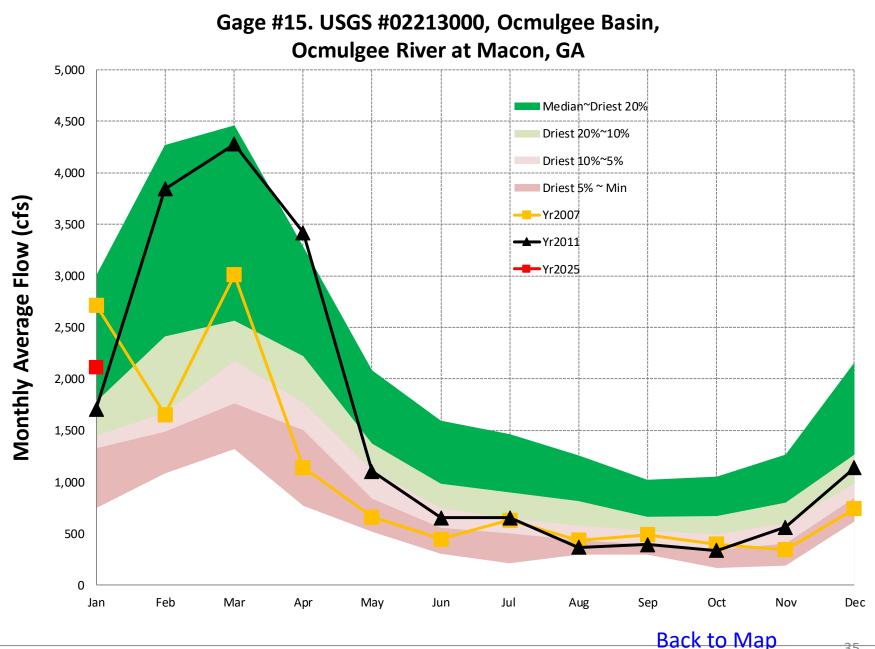


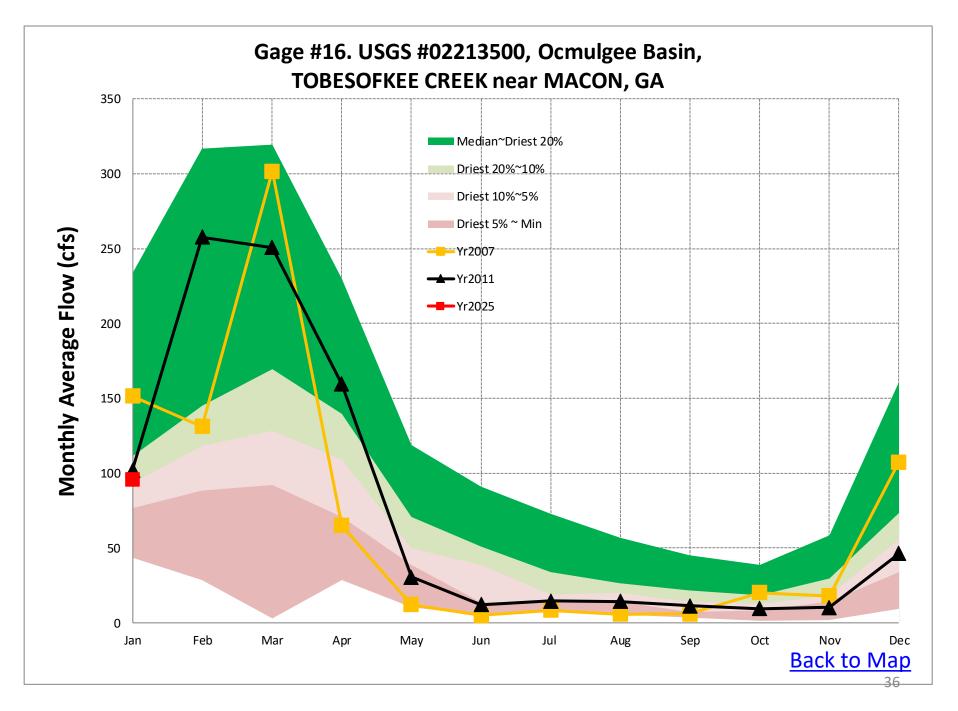


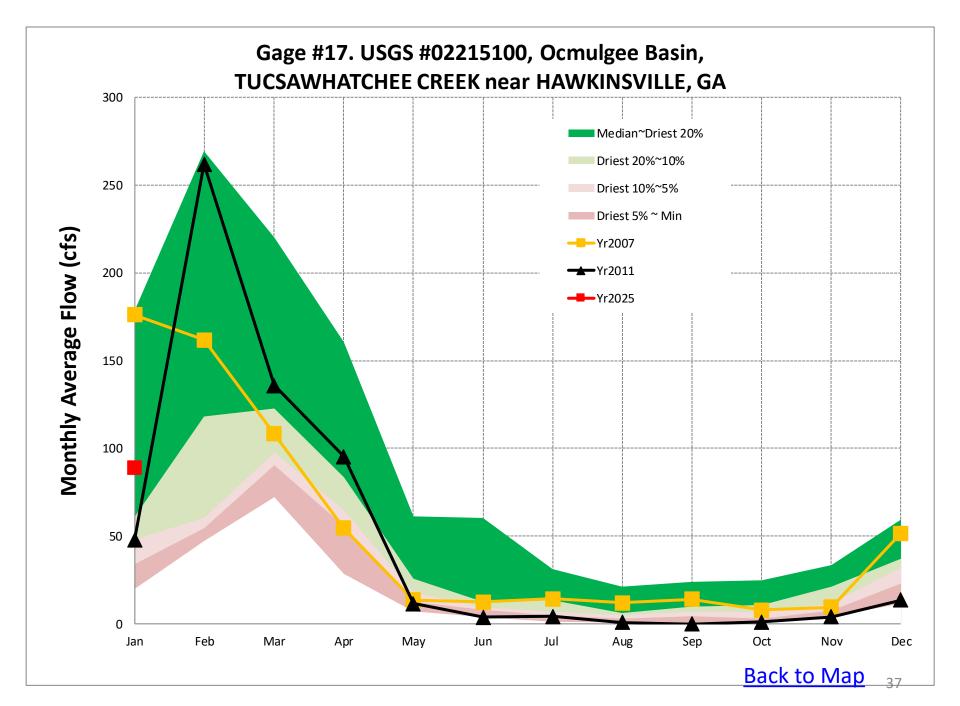


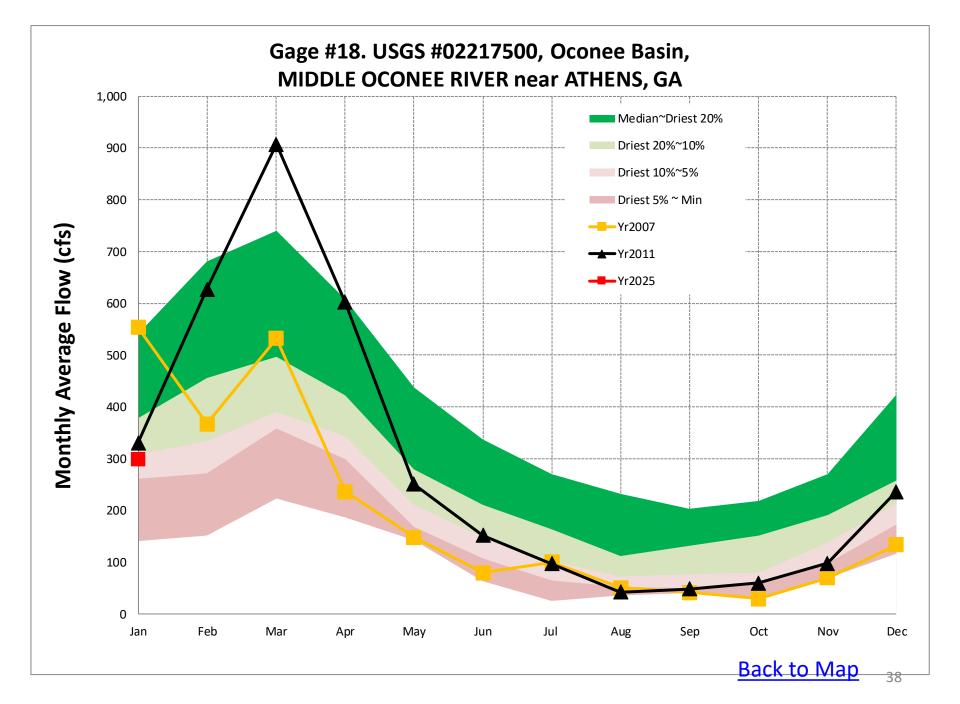


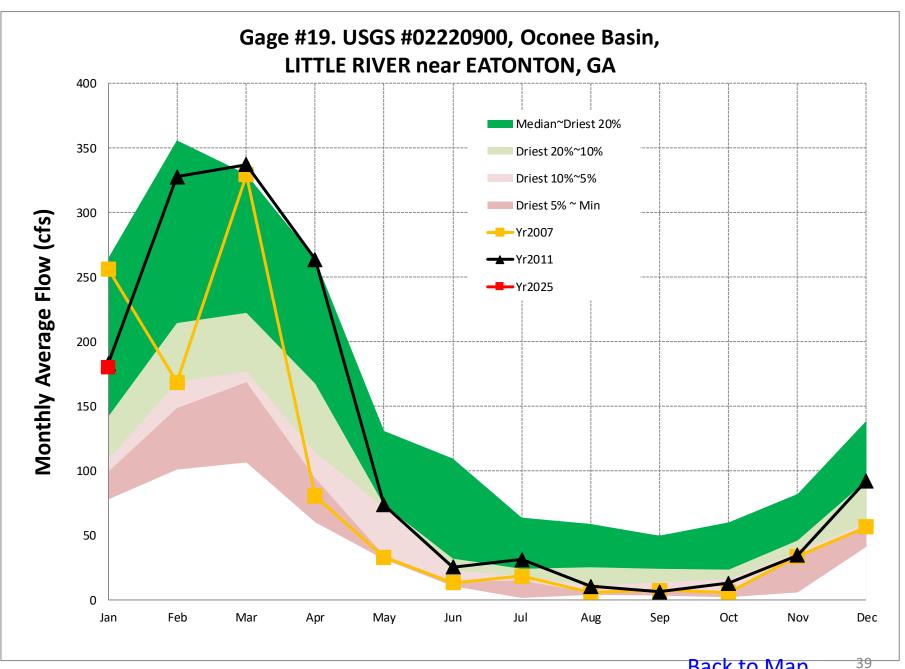


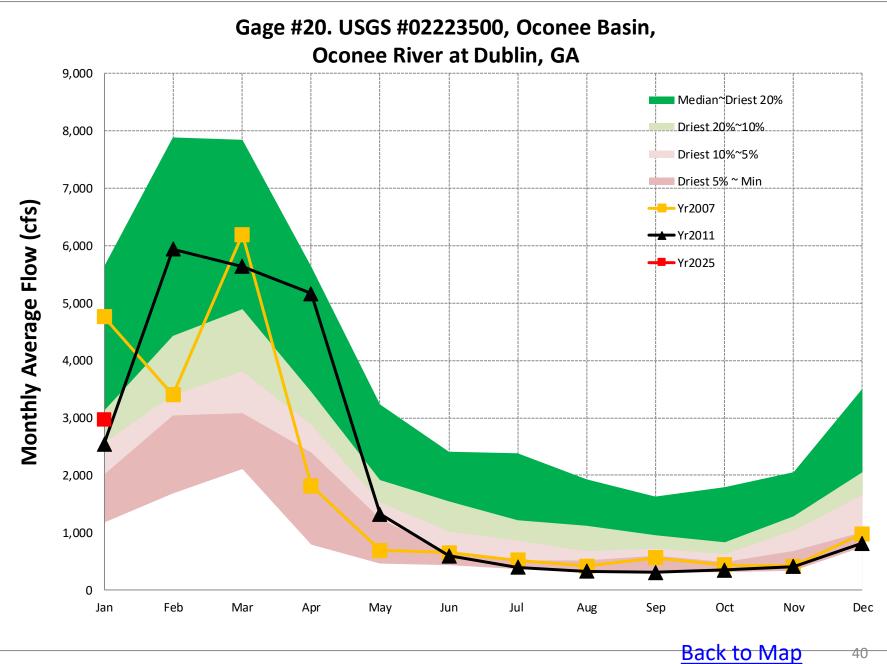


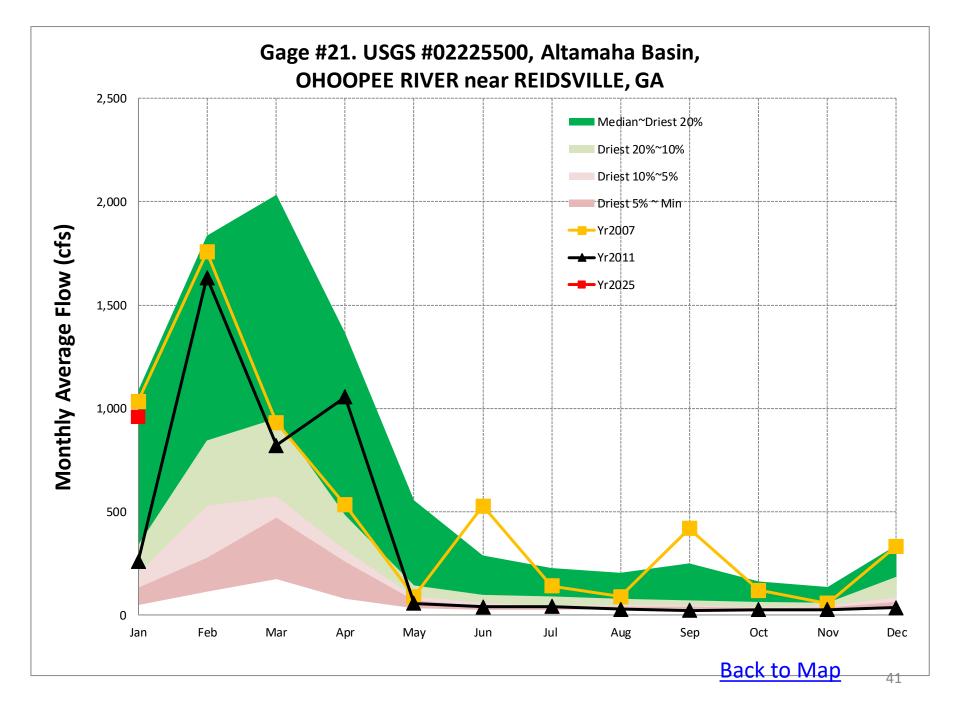


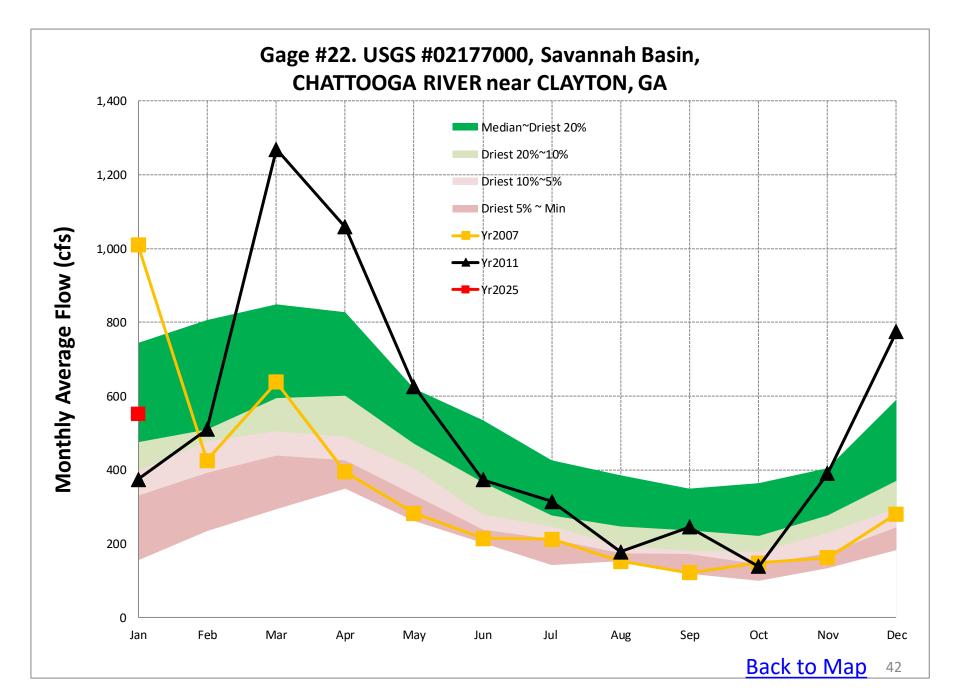


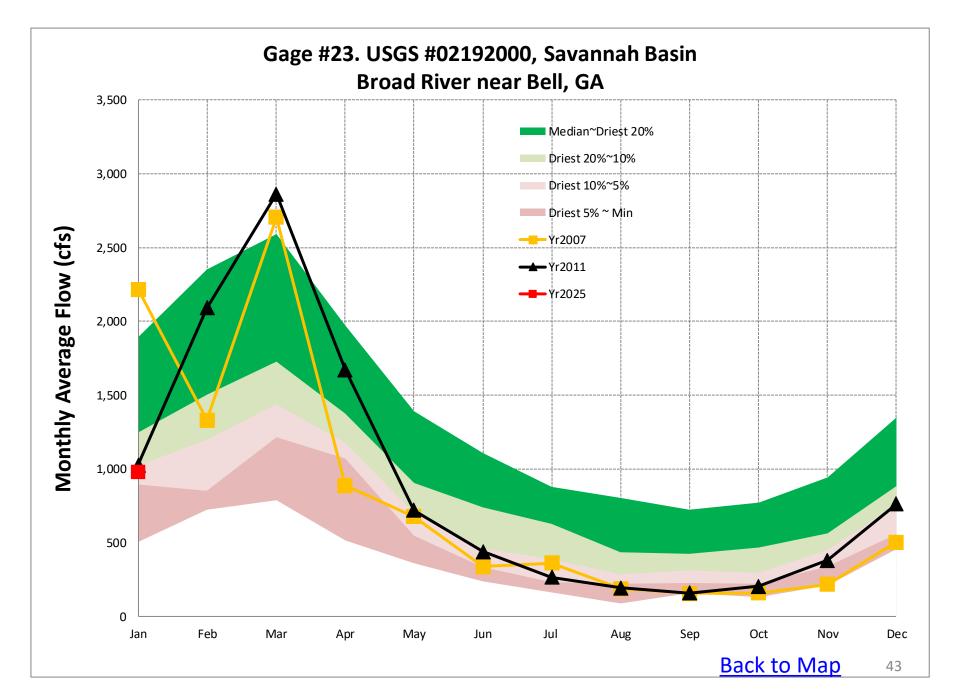


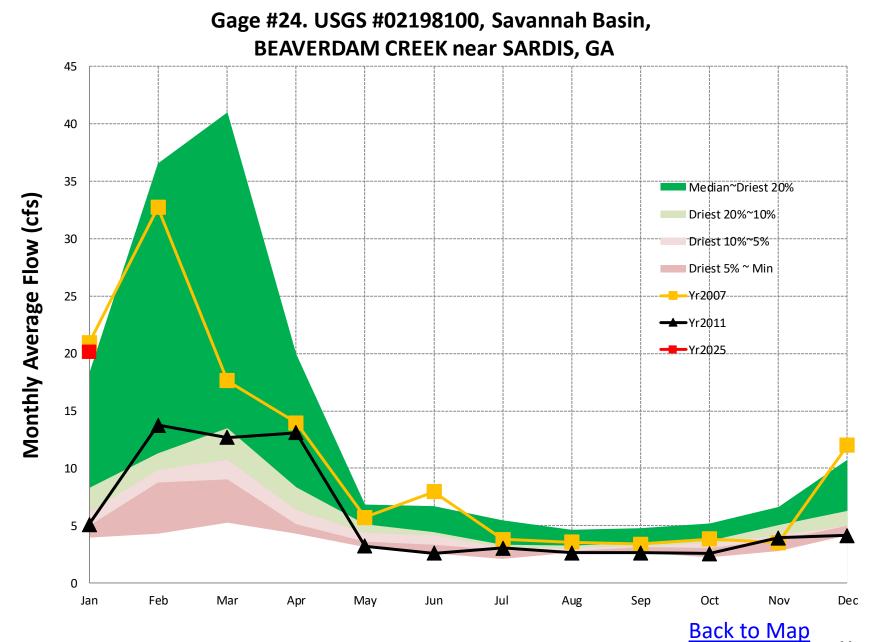


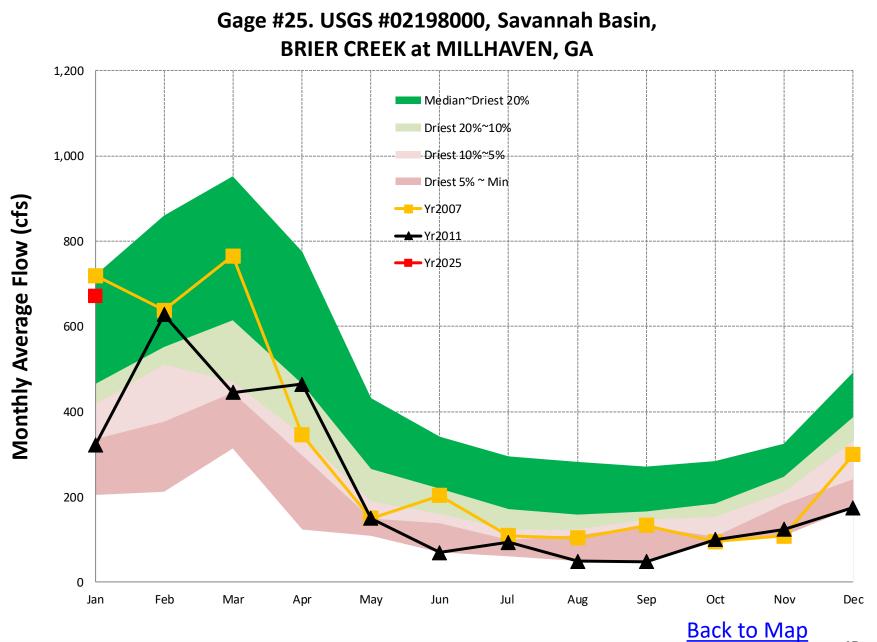


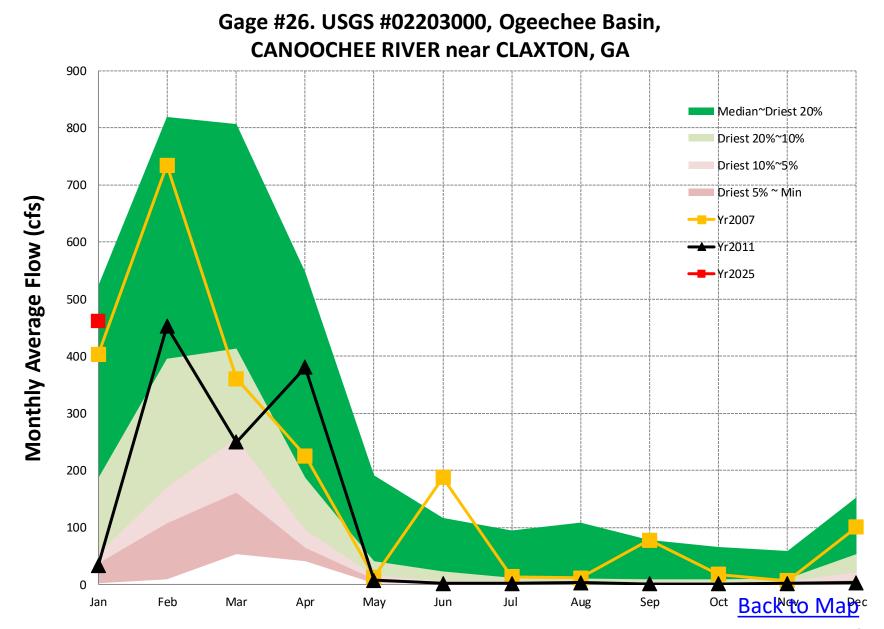


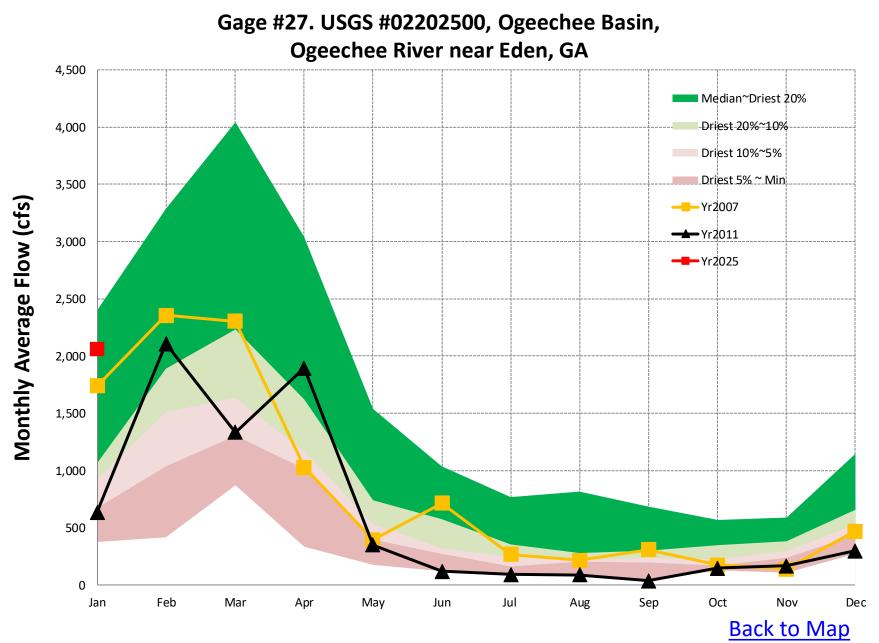


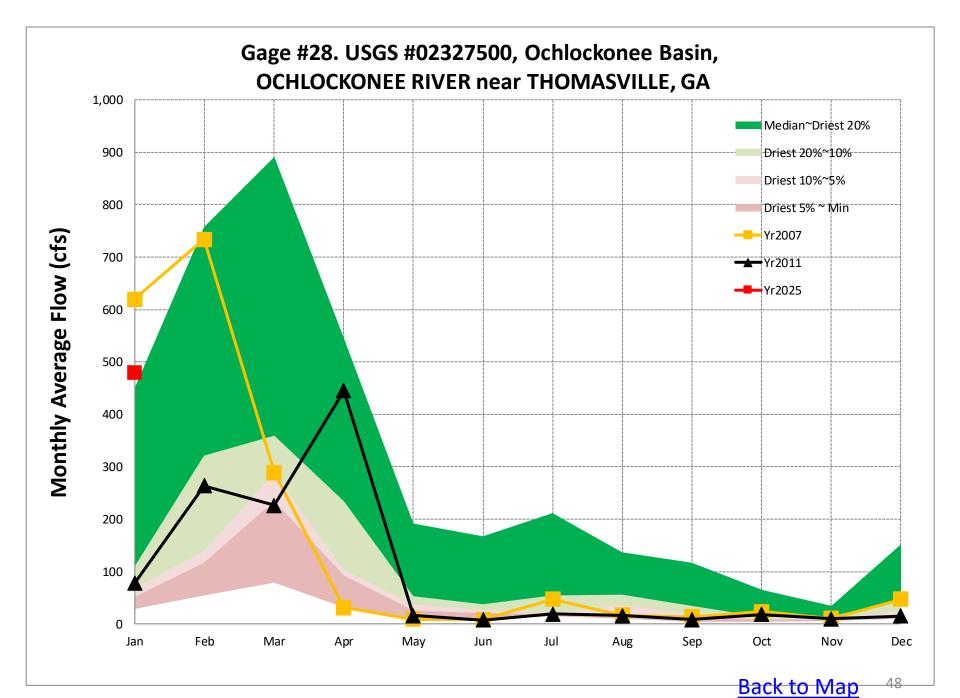


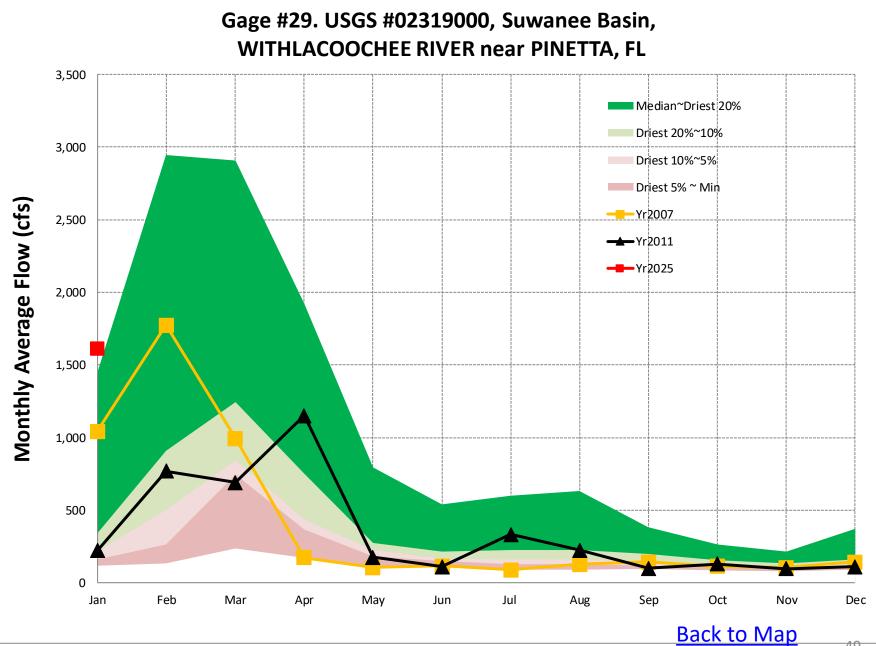


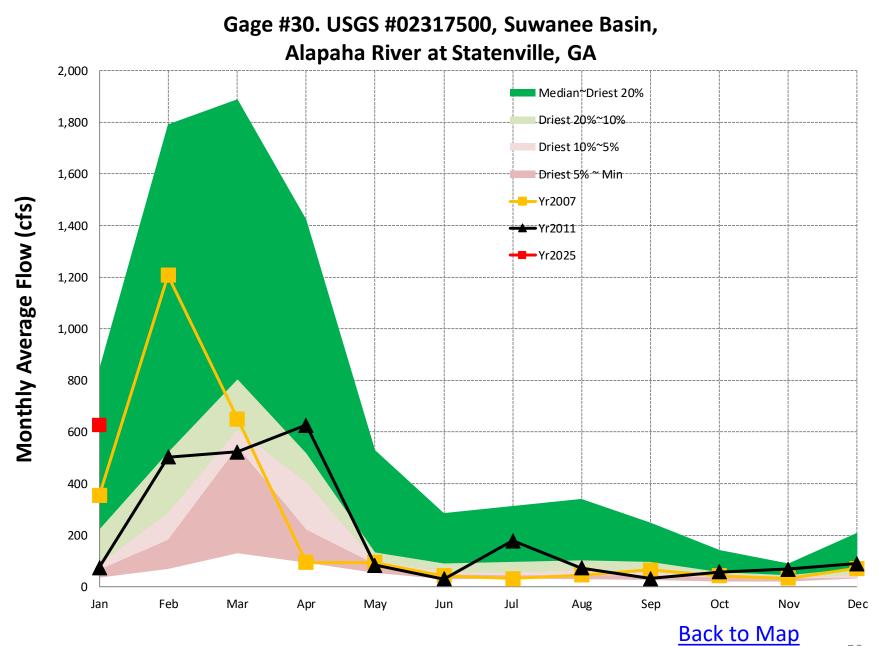


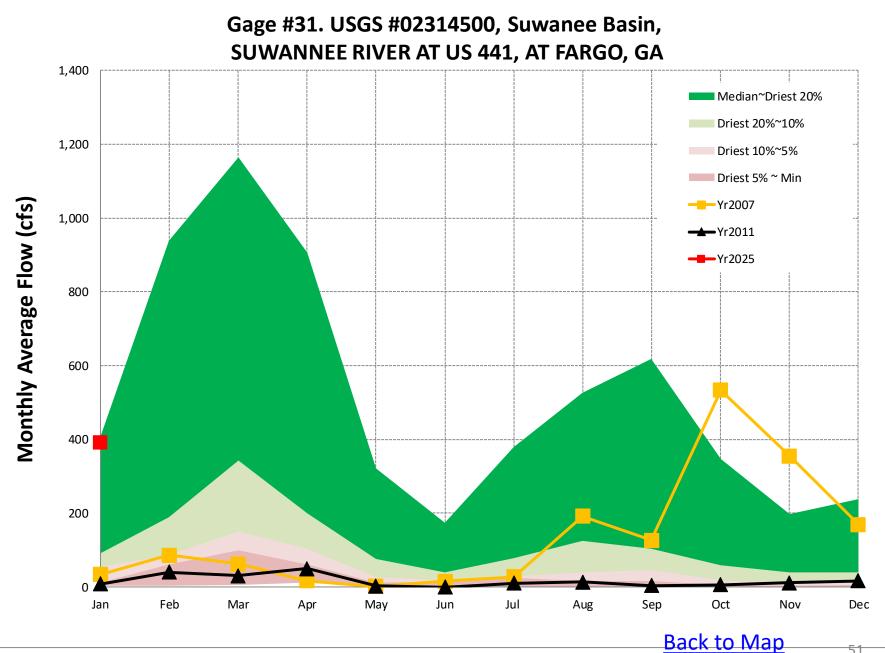


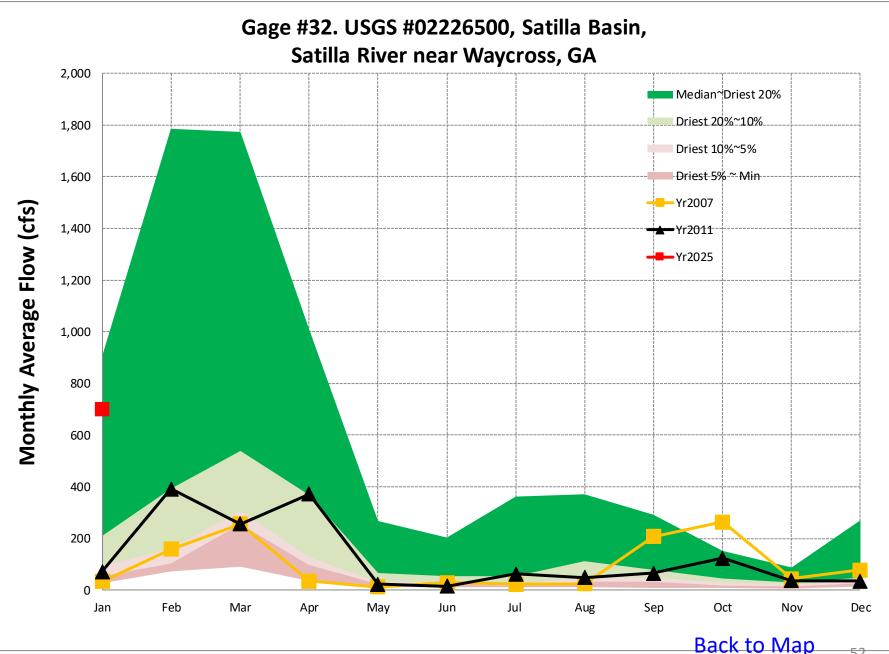


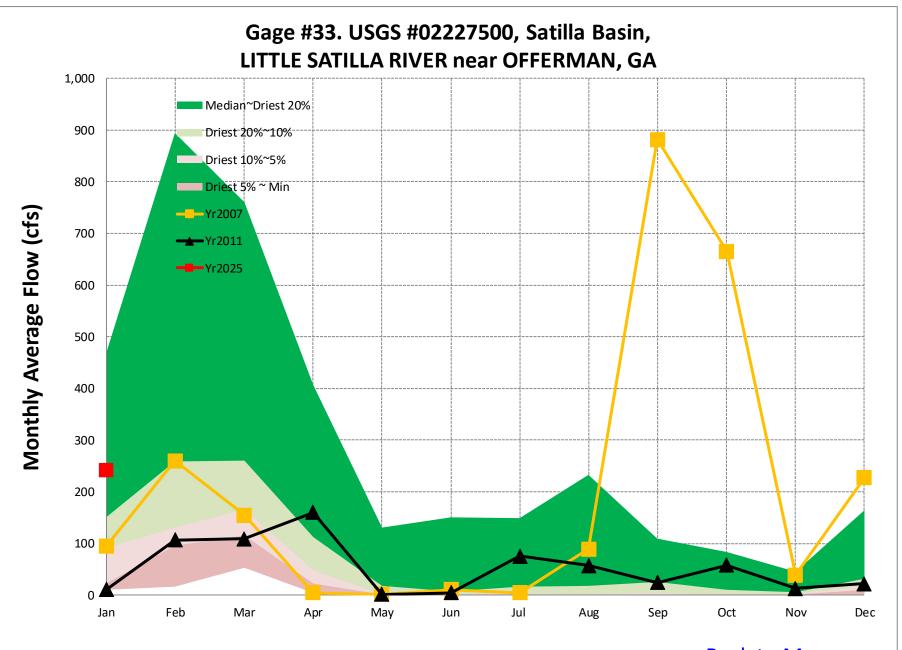


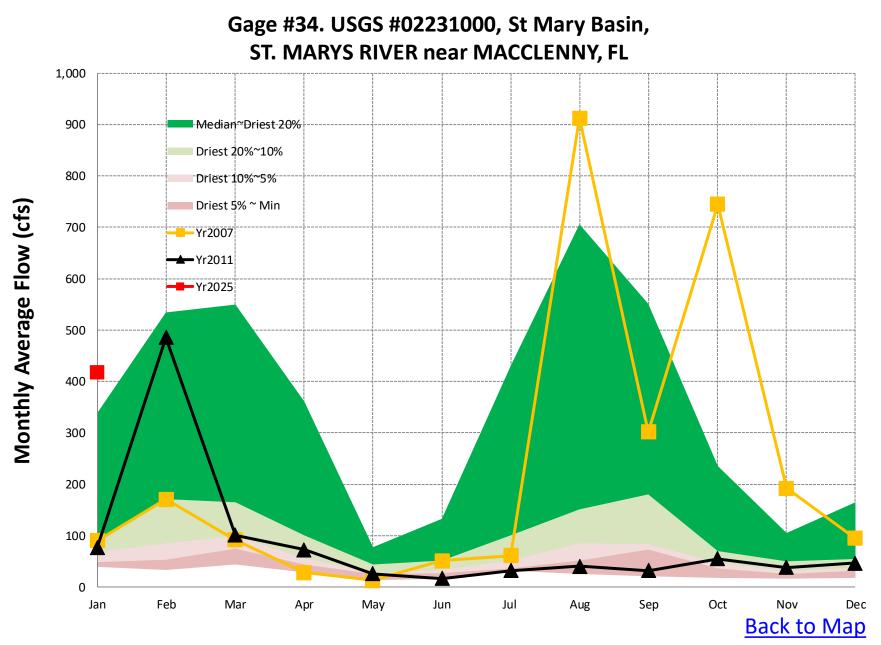












Groundwater Levels

Data Source: USGS

Rationale for Choosing USGS Monitoring Wells

EPD monitors 17 groundwater USGS monitoring wells shown on the following slide to assess drought conditions. These wells were selected for monitoring because they have:

- Long-term monitoring records consisting of three decades or more of data; and
- Real-time monitoring that represents the most up-to-date conditions.

USGS Wells Monitored

Chattahoochee Basin

1.16MM03

Flint Basin

2. 11AA01

3. 13L180

4. 12M017

5. 08K001

6. 11K003

7. 12K014

8. 13J004

9. 08G001

10. 10G313

11. 09F520

16. 11J011

Oconee Basin

12.21T001

Tennessee Basin

13.03PP01

Suwanee Basin

14. 19E009 17. 27E004

Ogeechee Basin

15.35P094

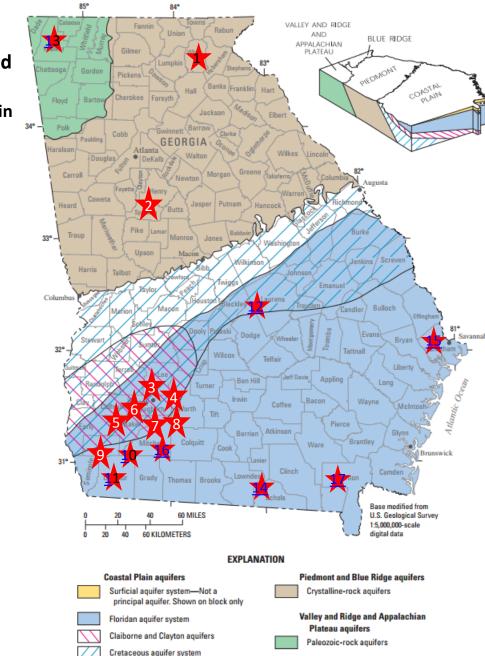


Figure 2. Area of use of principal aquifers and physiographic provinces in Georgia (modified from U.S. Geological Survey, 2006).

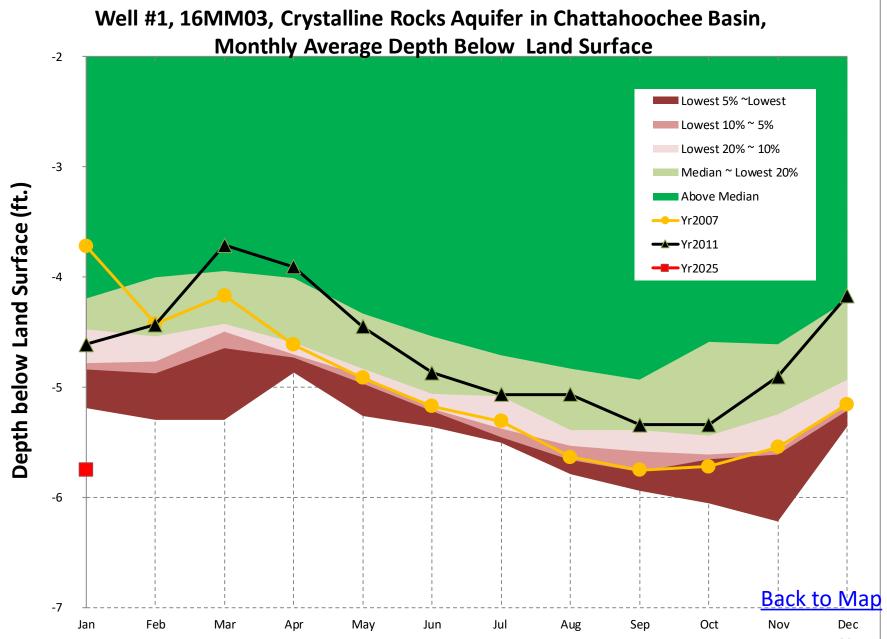
Groundwater Level Graphs

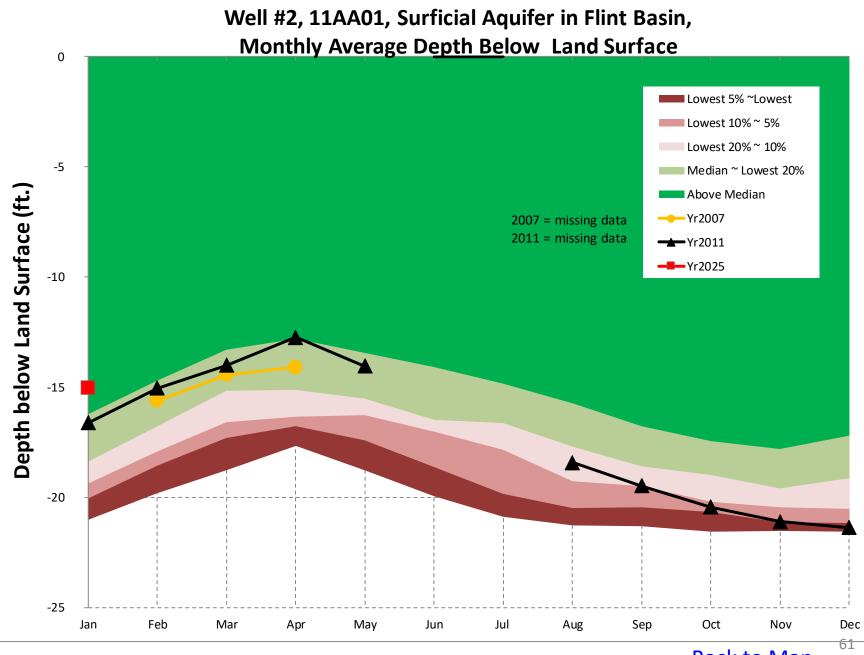
- For each of the 17 groundwater wells, EPD has prepared a graph that shows monthly average groundwater levels from January 2025 through January 2025;
- To help put these levels into perspective, for comparison purposes, each graph also shows:
 - Monthly average levels at that same well for the years 2007 and 2011 when groundwater levels were at or near recorded low levels across much of the state; and
 - And a statistical composite of historical conditions at that same gage showing the "lowest" 50, 20, 10, and 5 percent of all recorded monthly average levels at the same well.

How to Read the Groundwater Level Graphs Example: Well #11, 09F520, Flint River Basin

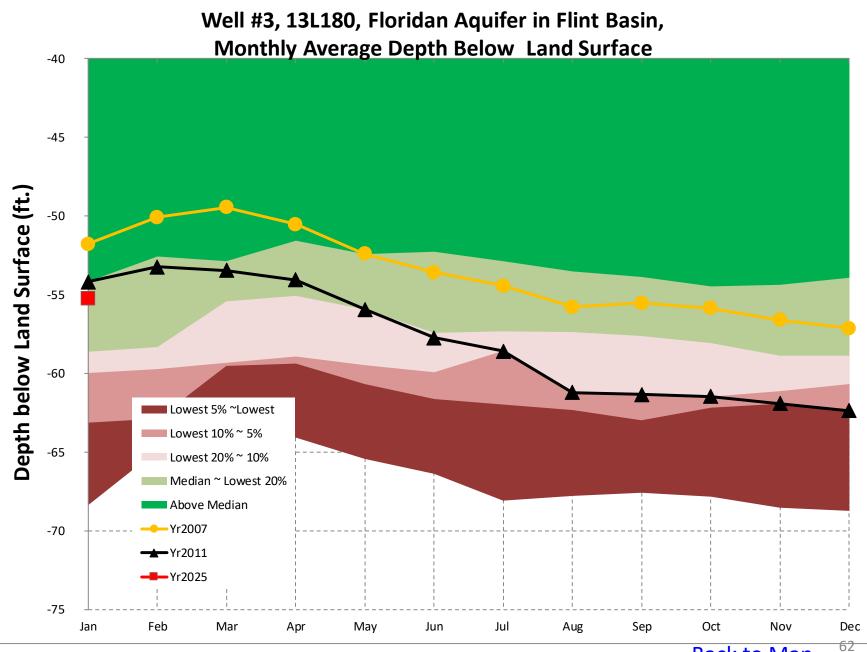
The groundwater level graph for Well #11, USGS 09F520 shows:

- The average monthly groundwater level in January 2025 was 48.2 ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in January have historically been lower than January 2025 about 30% of the time; about 70% of the time in January they have been higher.
- The average monthly groundwater level in January 2011 was 49.6 ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in January have historically been lower than January 2011 about 10~20% of the time; about 80~90% of the time in January they have been higher.
- The average monthly groundwater level in January 2007 was 47.7 ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in January have historically been lower than January 2007 about 40% of the time; about 60% of the time in January they have been higher.

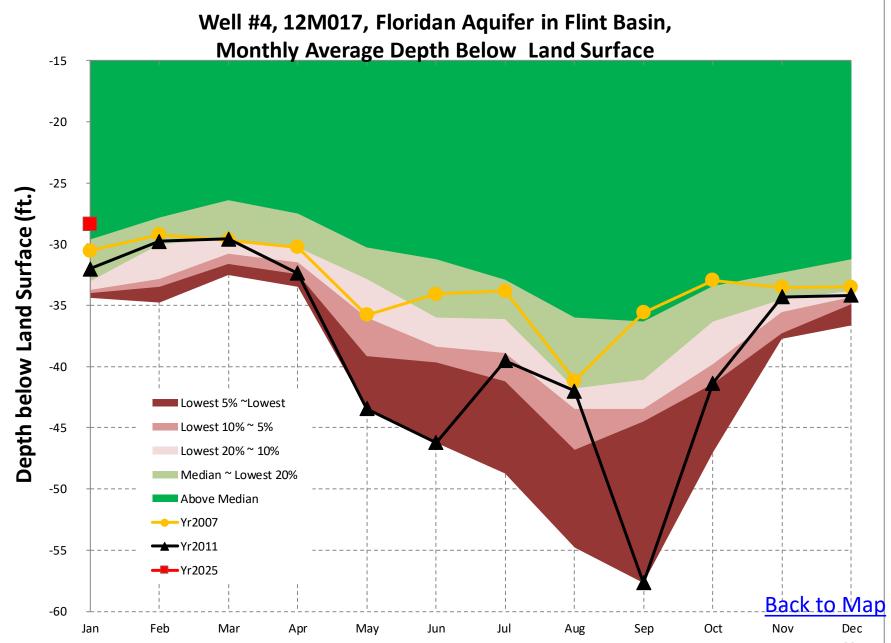


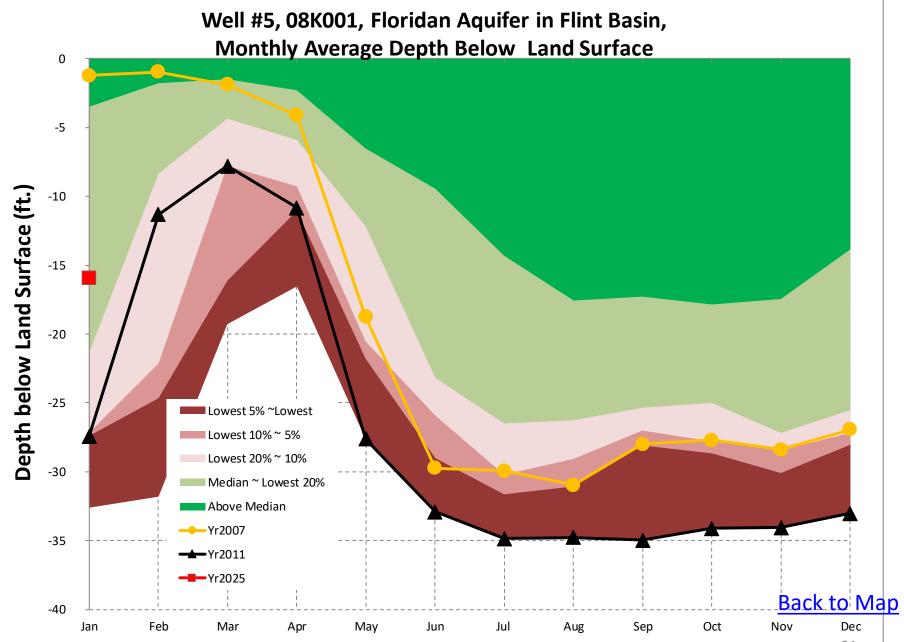


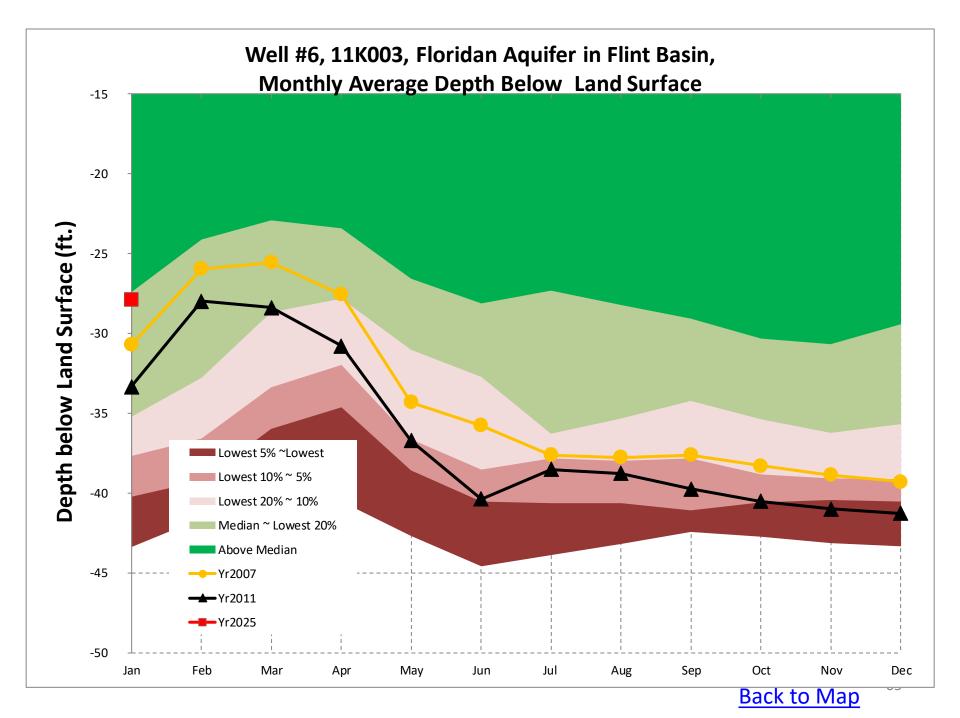
Back to Map

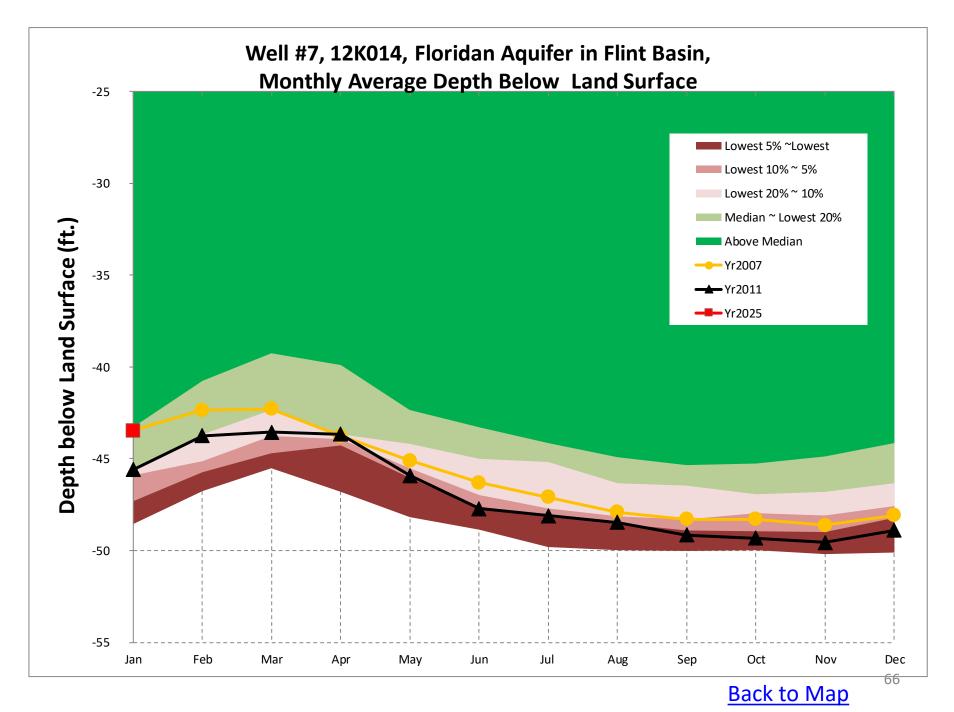


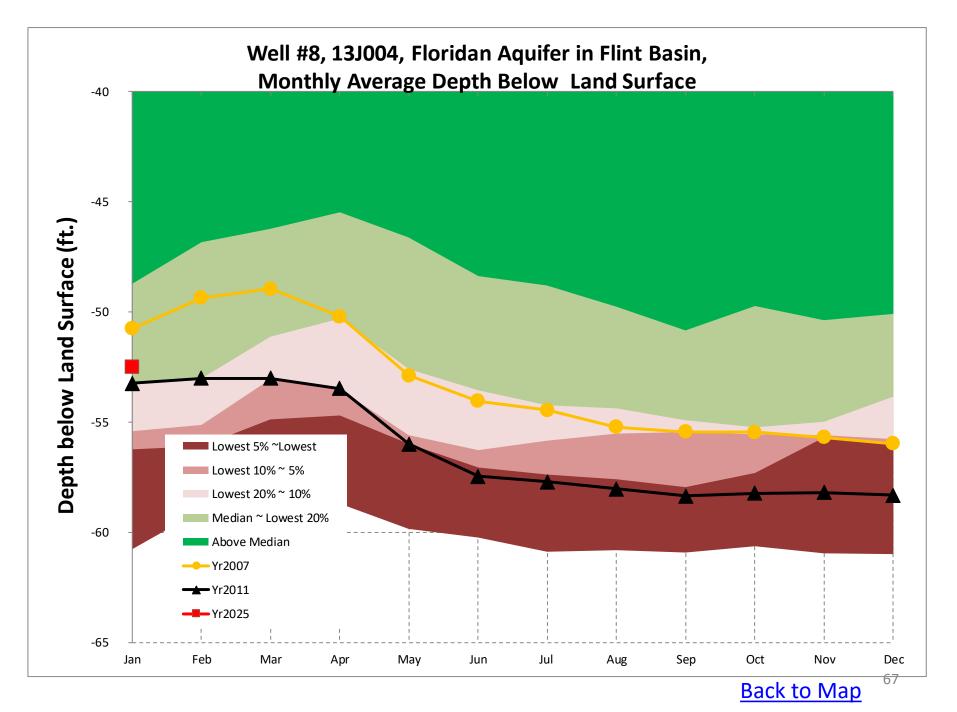
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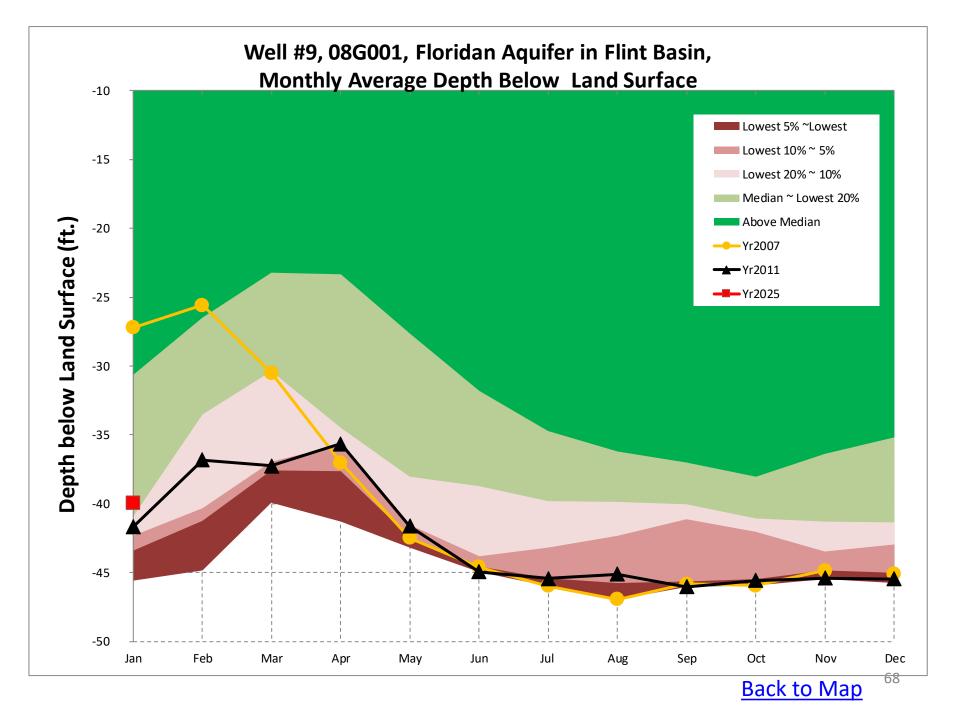


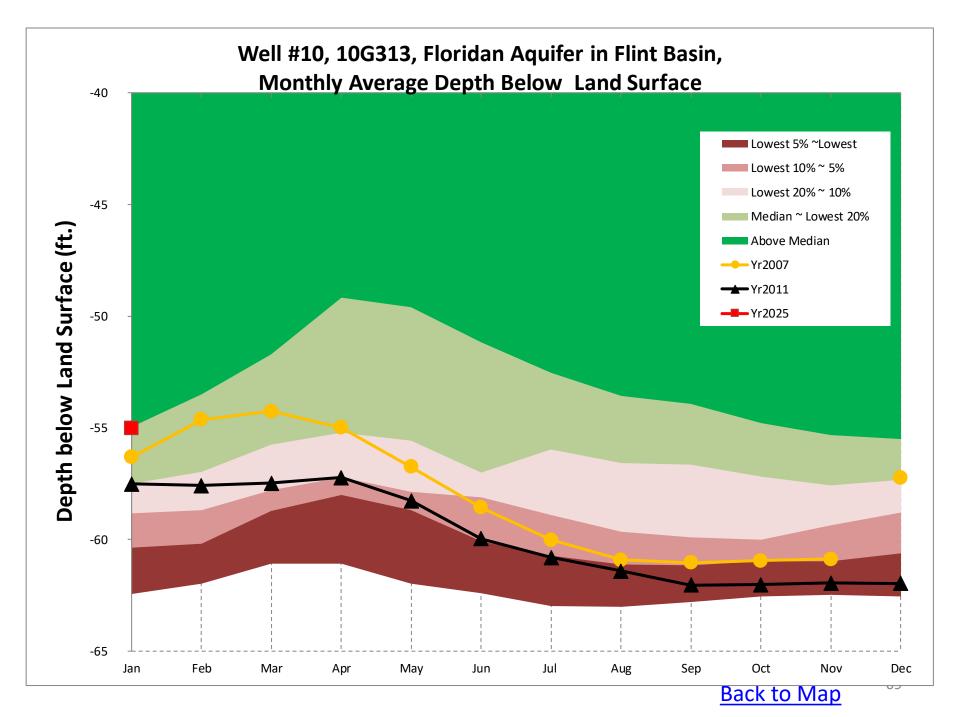


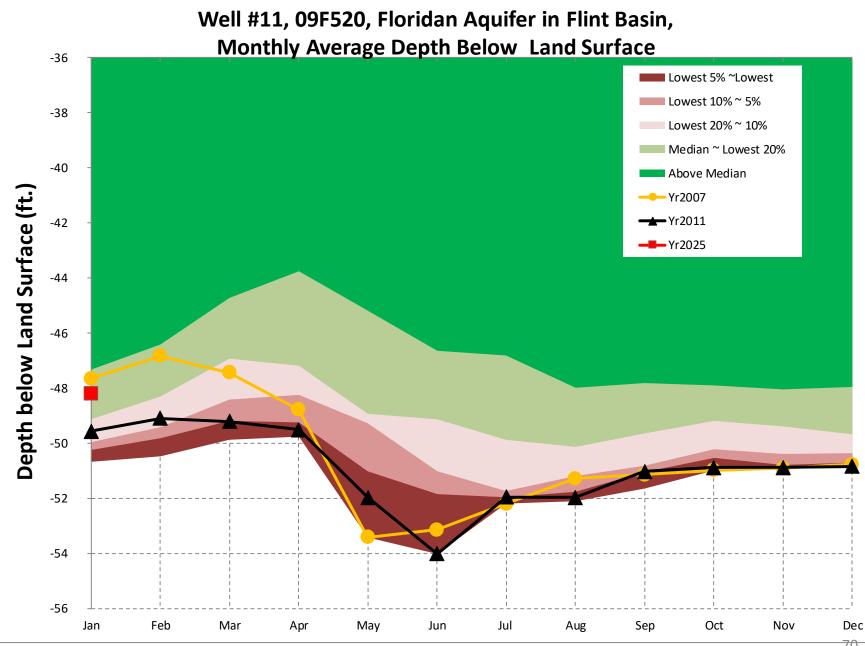






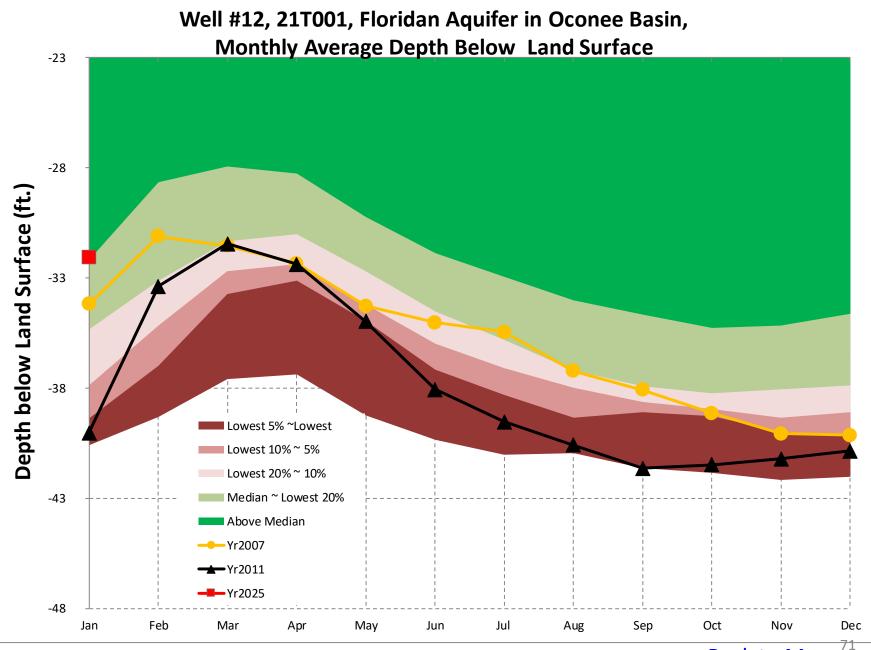


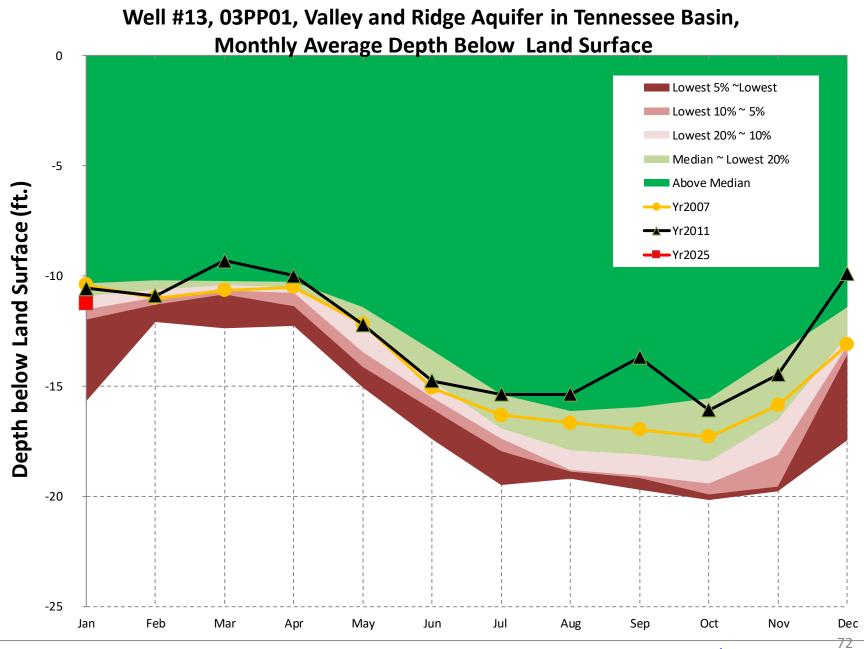




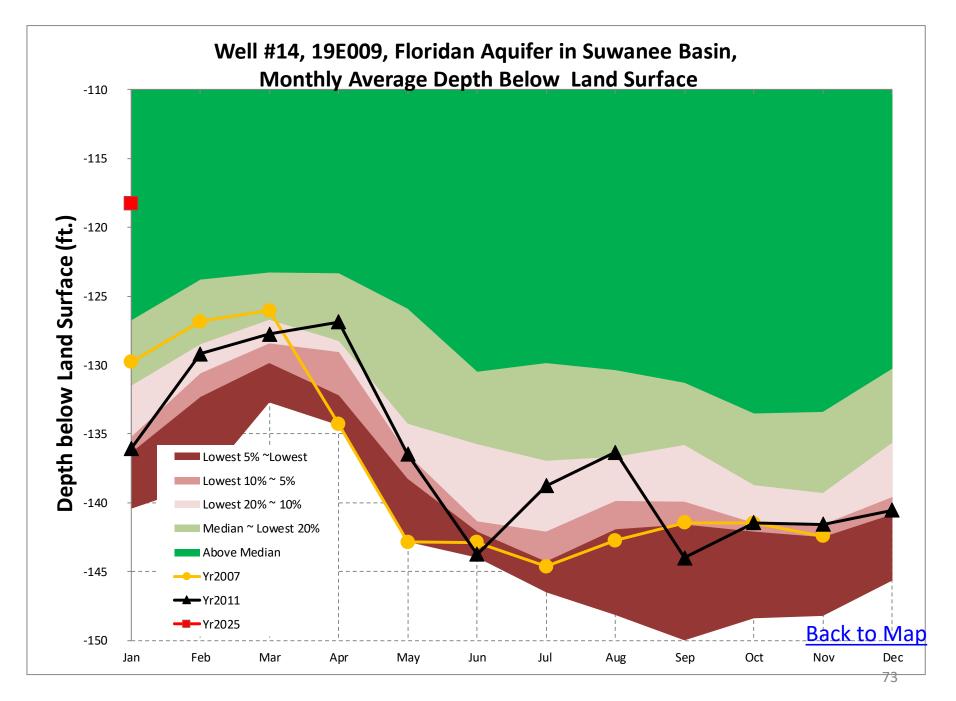
Back to Interpretation

Back to Map⁷⁰

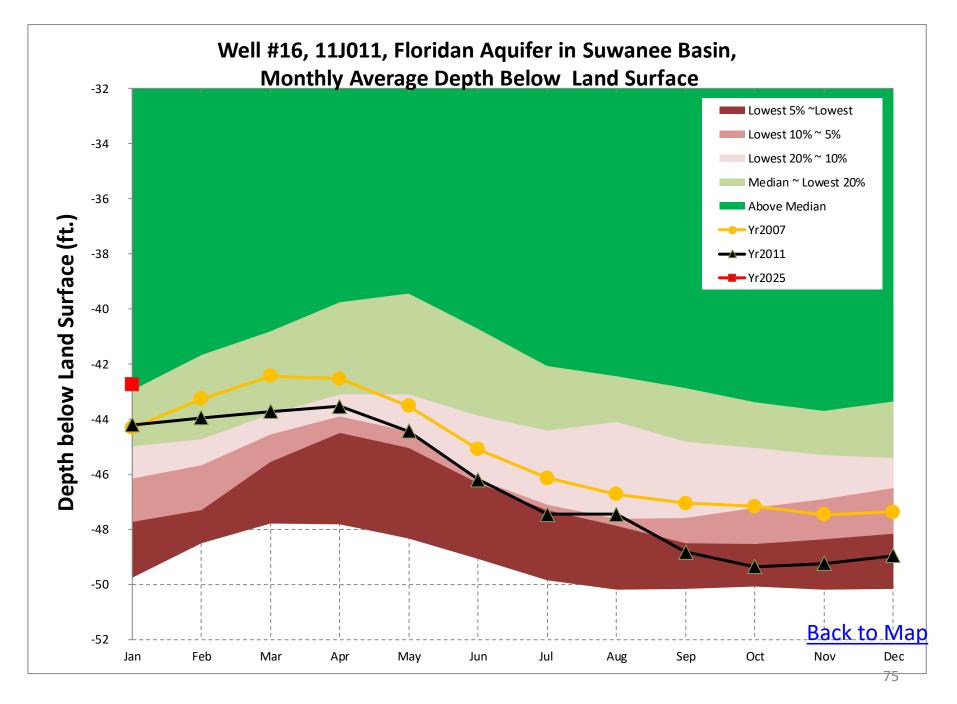


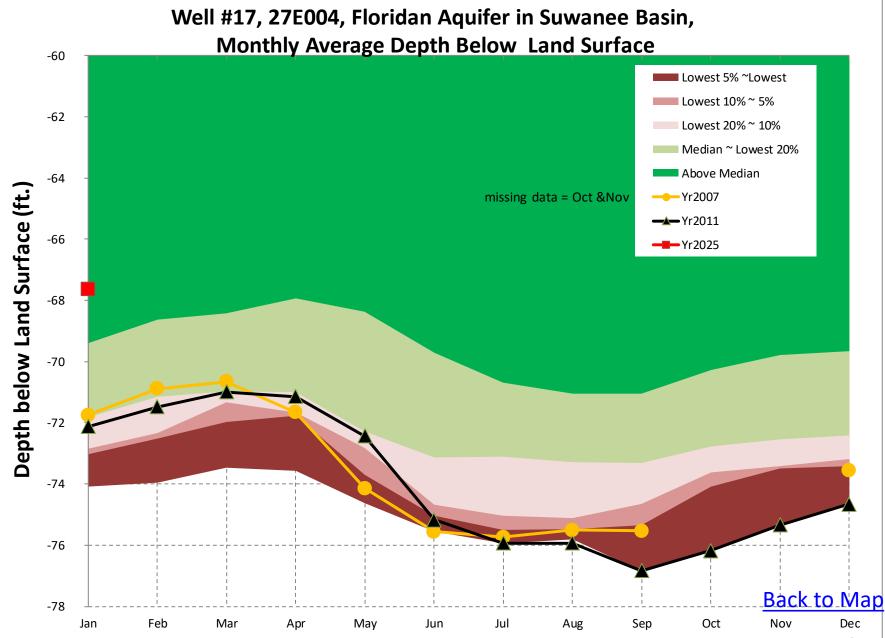


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Well #15, 35P094, Surficial Aquifer in Ogeechee Basin, Monthly Average Depth Below Land Surface 0 Lowest 5% ~Lowest Lowest 10% ~ 5% Lowest 20% ~ 10% -2 Median ~ Lowest 20% Depth below Land Surface (ft.) Above Median Yr2007 **-A-Yr2011** -4 Yr 2025 missing data -6 -8 -10 Back to Map -12 Feb Mar Jul Sep Oct Nov Dec Apr May Aug Jan Jun





Reservoir Levels

Data Source: US Army Corps of Engineers

Coosa Basin

- 1. Carters
- 2. Allatoona

Chattahoochee Basin

- 3. Lanier
- 4. West Point
- 5. W.F. George

Savannah Basin

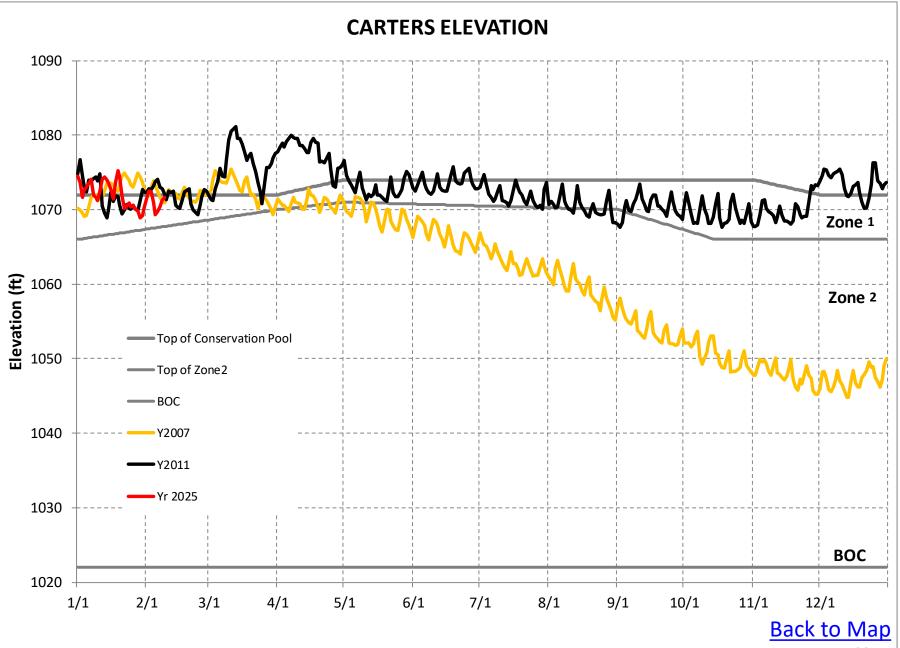
- 6. Hartwell
- 7. Thurmond

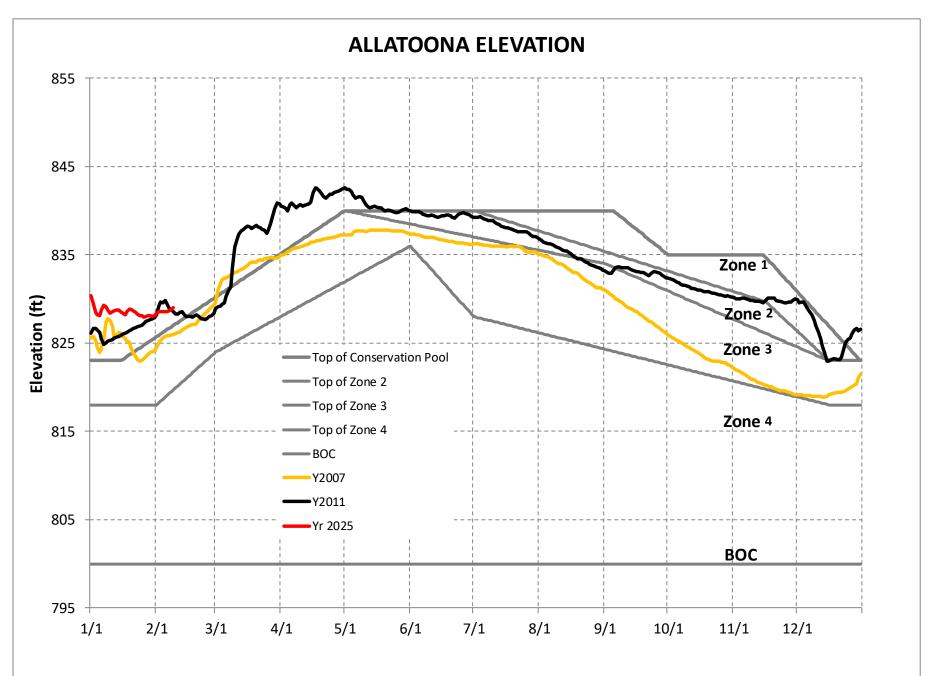


EPD monitors the water levels of seven reservoirs to assess drought conditions.

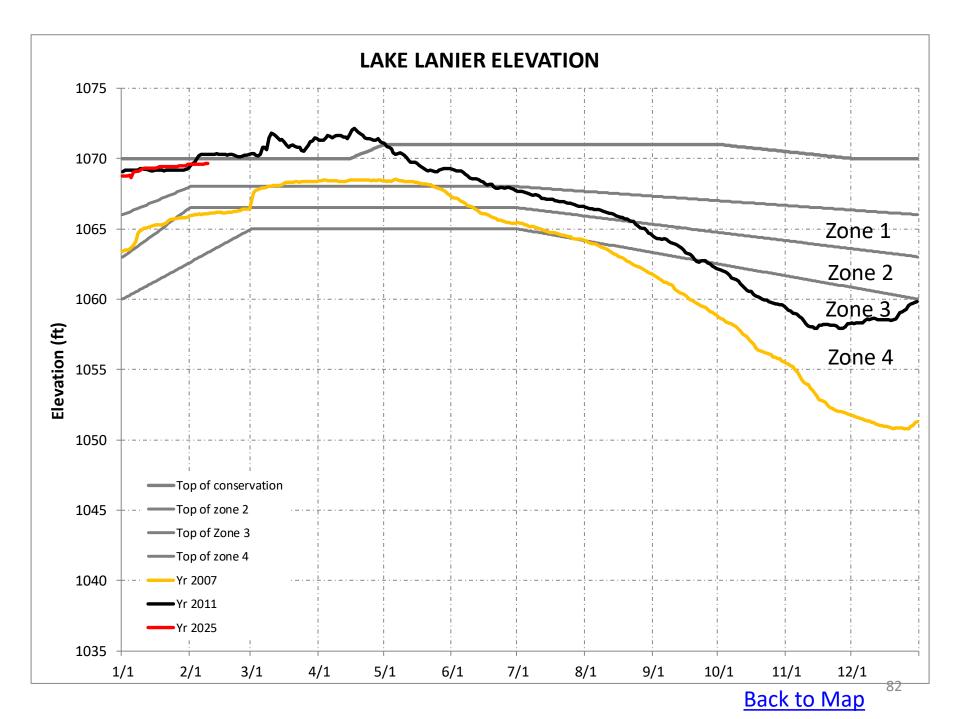
Reservoir Elevation Graphs

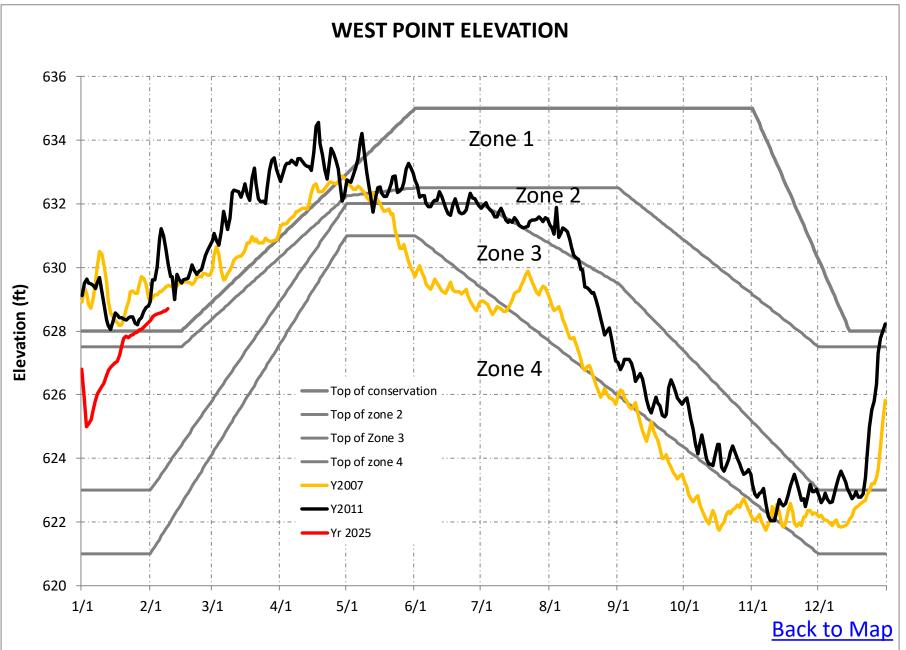
- The following graphs show the reservoir elevation curves for January 2025 through January 2025.
- Each graph also shows the Action Zone Divides (or Levels) for each reservoir
 - Zone 1 is the top layer of the conservation pool
 - Zone 2 is the layer below Zone 1
 - Zone 4 is the lowest layer in the conservation pool
 - There is no conservation storage below the bottom of Zone 4
- To put 2025 reservoir elevations into perspective, elevations for 2007 and 2011 are also shown.

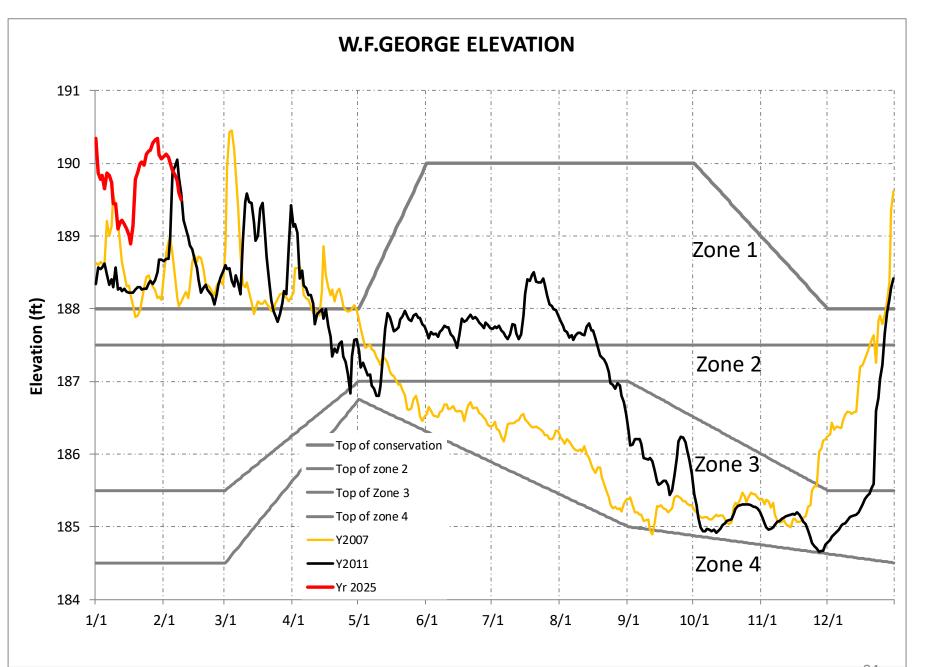




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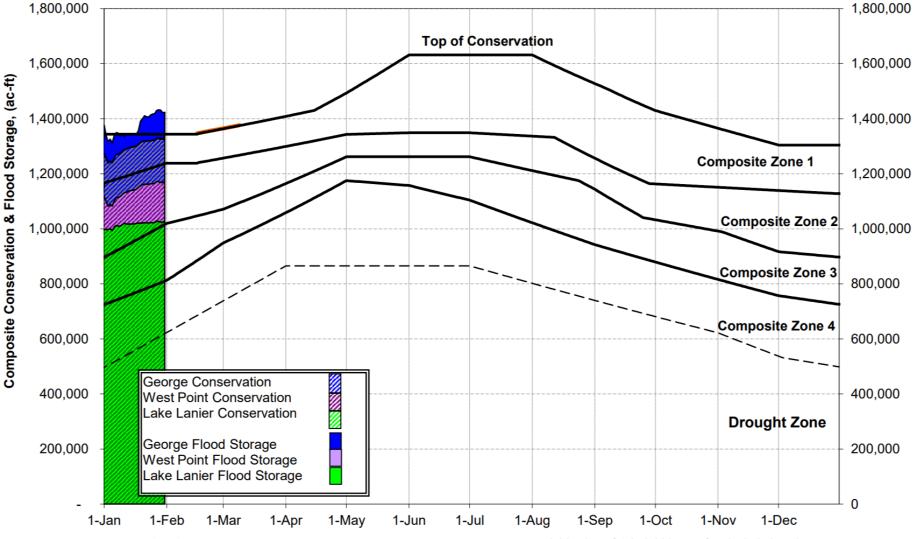






Back to Map

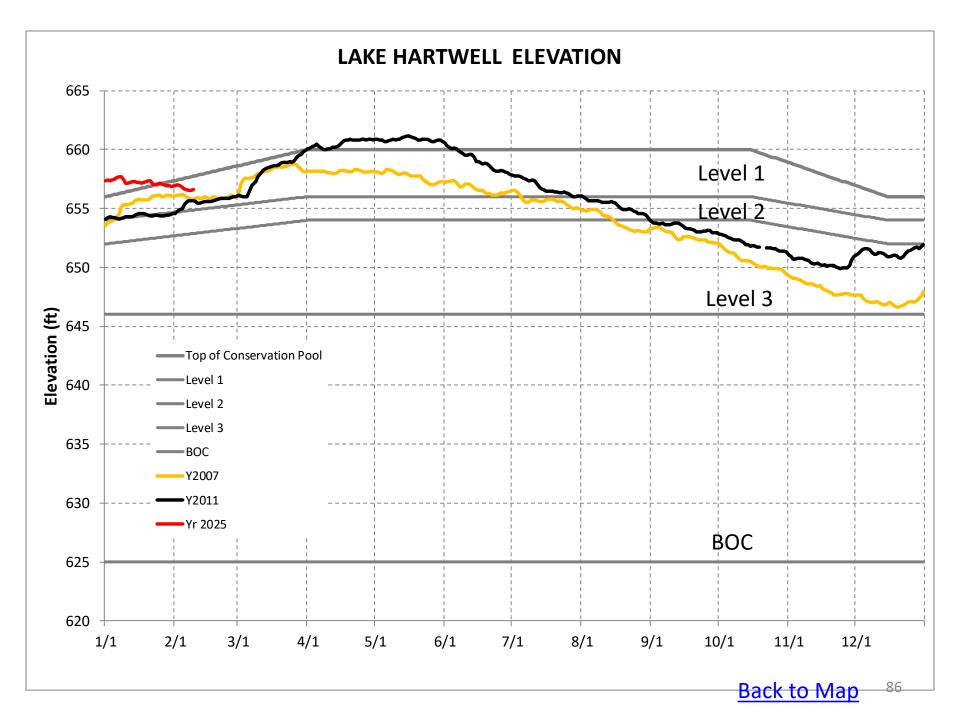
84

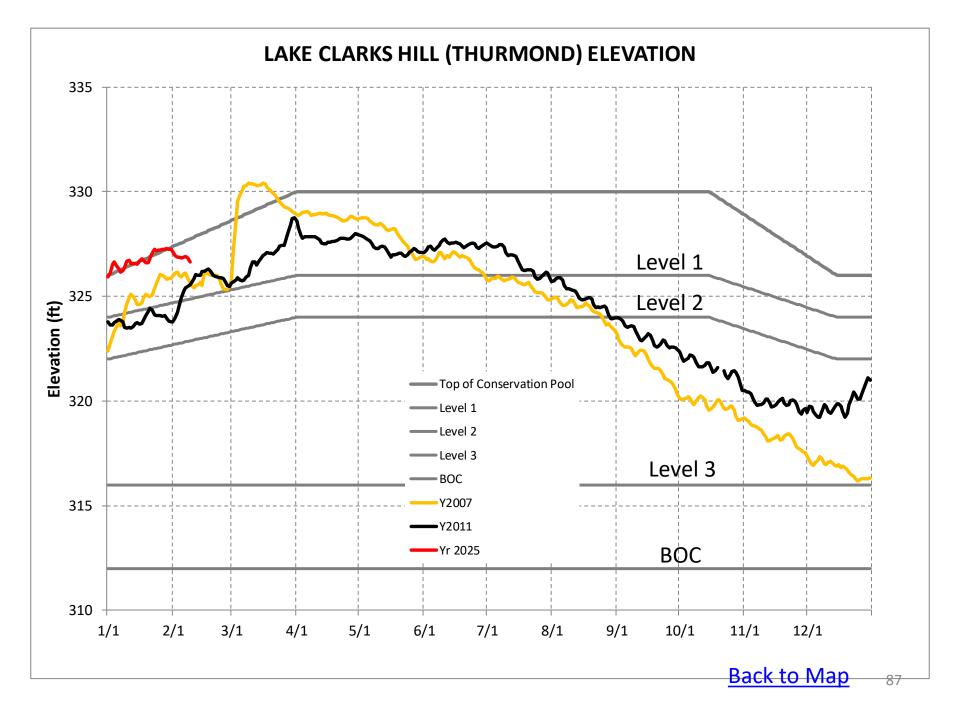


2025 ACF Basin Composite Conservation and Flood Storage

Actual data thru 2/10/2025

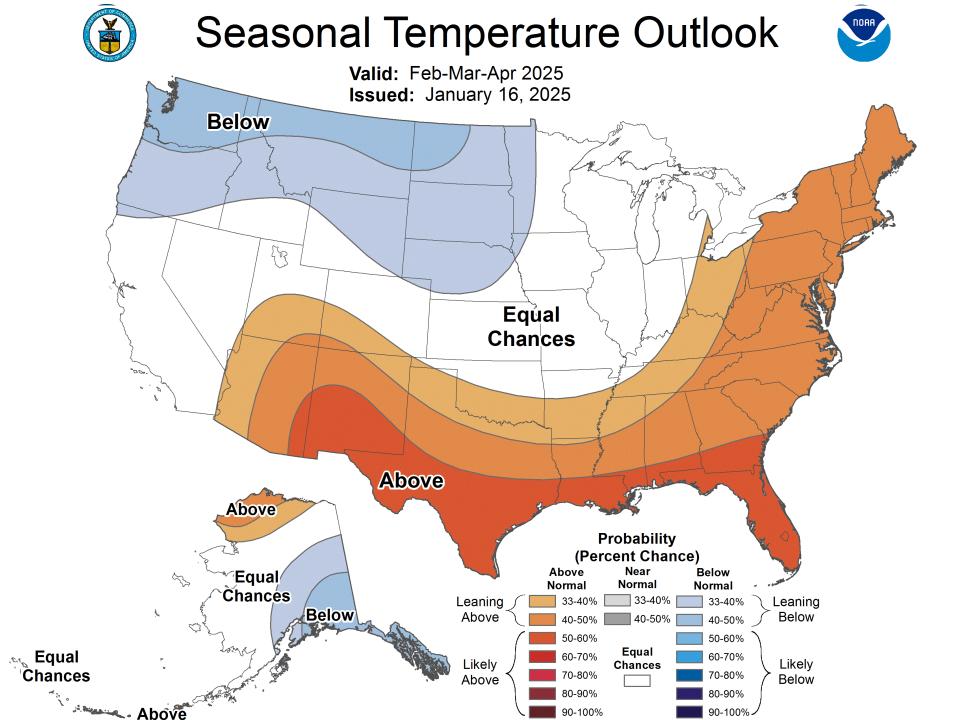
Add value of 1,856,000 acre-ft to include inactive storage.

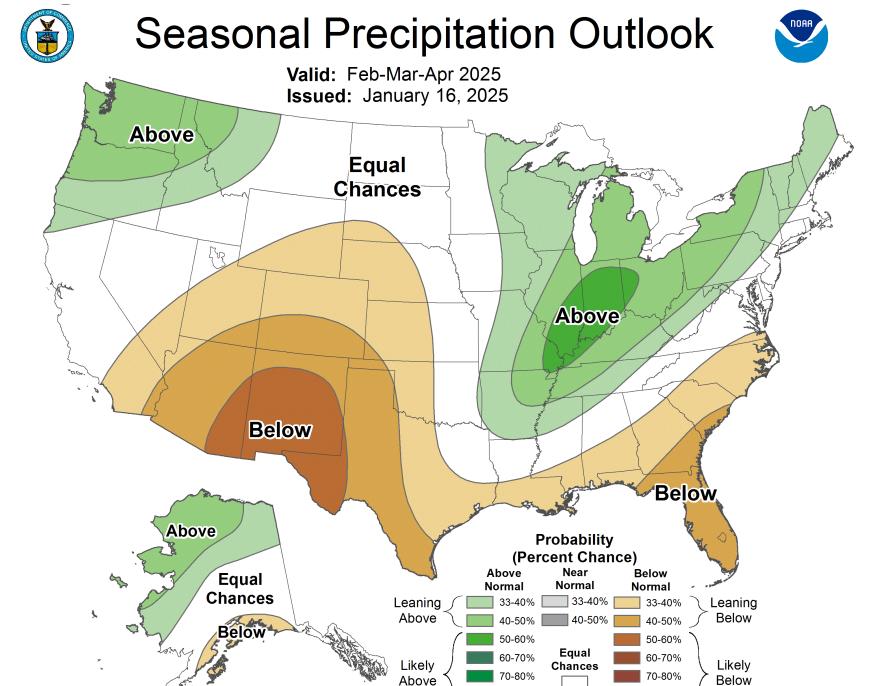




Climate Prediction Center 3-month Temperature and Precipitation Probability Outlook and Seasonal Drought Outlook

> Data Source: http://www.cpc.ncep.noaa.gov/





80-90%

90-100%

80-90%

90-100% -

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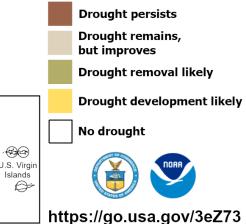
U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for February 1 - April 30, 2025 Released January 31, 2025



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).



Author: Yun Fan NOAA/NWS/NCEP Climate Prediction Center



Hawaii

