Drought Indicators Report

Georgia Environmental Protection Division

November 2023

Background

Pursuant to the Rules for Drought Management, Section 391-3-3-.04 Drought Indicators and Triggers, 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 October 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 November 9, 2023.

Drought Indicator Analysis Summary (slide 1 of 2)

- U.S. Drought Monitor – Abnormally Dry (D0, the least intense level) exists in most areas except Middle GA and Suwannee-Satilla region. Moderate drought (D1) exists in North GA and Lower Flint-Ochlockonee region. Severe drought (D2) exists in Coosa, Tennessee, Lower Chattahoochee, and Lower Flint Basins. Extreme drought (D3) exists in Coosa Basin and Seminole County. Exceptional Drought (D4) exists in five Counties (Dade, Walker, Catoosa, Whitefield, and Chattooga) at Northwest Corner.

- Precipitation – Three-month precipitation is below normal in most areas except Lower Savannah, Upper Oconee, Middle-Ocmulgee, Altamaha and part of Suwannee-Satilla Regions. Six-month precipitation is below normal in Coosa-North GA, Southwest Corner and a few counties in other areas. Twelve-month precipitation is below normal in the southwest corner of the state, Echols County, Rabun County, and Chatham County.

- Soil Moisture – Soil moisture conditions are below normal in six Counties (Harris, Talbot, Upson, Taylor, Quitman, Clay, and Randolph).

Drought Indicator Analysis Summary (slide 2 of 2)

- Streamflow – Stream flows at 13 selected USGS gages (13 out of 34) are near or above normal. Seven gages are between the lowest 20th percentile and median. Nine gages are between the lowest 10th and 20th percentiles and three gages are between lowest 10th and 5th percentiles. Two gages are between the lowest 5th percentile and minimum (one in Tennessee Basin, the other in Upper Savannah Basin).
- Groundwater Level – Groundwater levels are above or near normal in four selected wells (4 out of 17). Seven well levels are between the lowest 20th percentile and median. Four well levels are between the lowest 20th and 10th percentiles. One well level(Floridan aquifer in Flint Basin) is between the lowest 10th and 5th percentiles, another well level (Crystalline Rocks Aquifer in Chattahoochee Basin) is between the lowest 5th percentile and minimum.
- Reservoir Levels – At the end of October, Carters and Allatoona are in zone 1. Lanier is in zone 3. Other Federal reservoirs in Georgia are in zone 2. ACF composite storage is in zone 2.
- Short-term Climate Prediction – National Climatic Prediction Center projects above normal temperature in North and Middle GA and above normal precipitation statewide in Nov 2023 – Jan 2024. U.S. Drought Outlook predicts drought remains but improves in Northwest Corner and drought removal likely in other areas of GA in Nov 2023 – Jan 2024.
- Water Supplies – No issues with water availability to water supply providers were reported.

US Drought Monitor

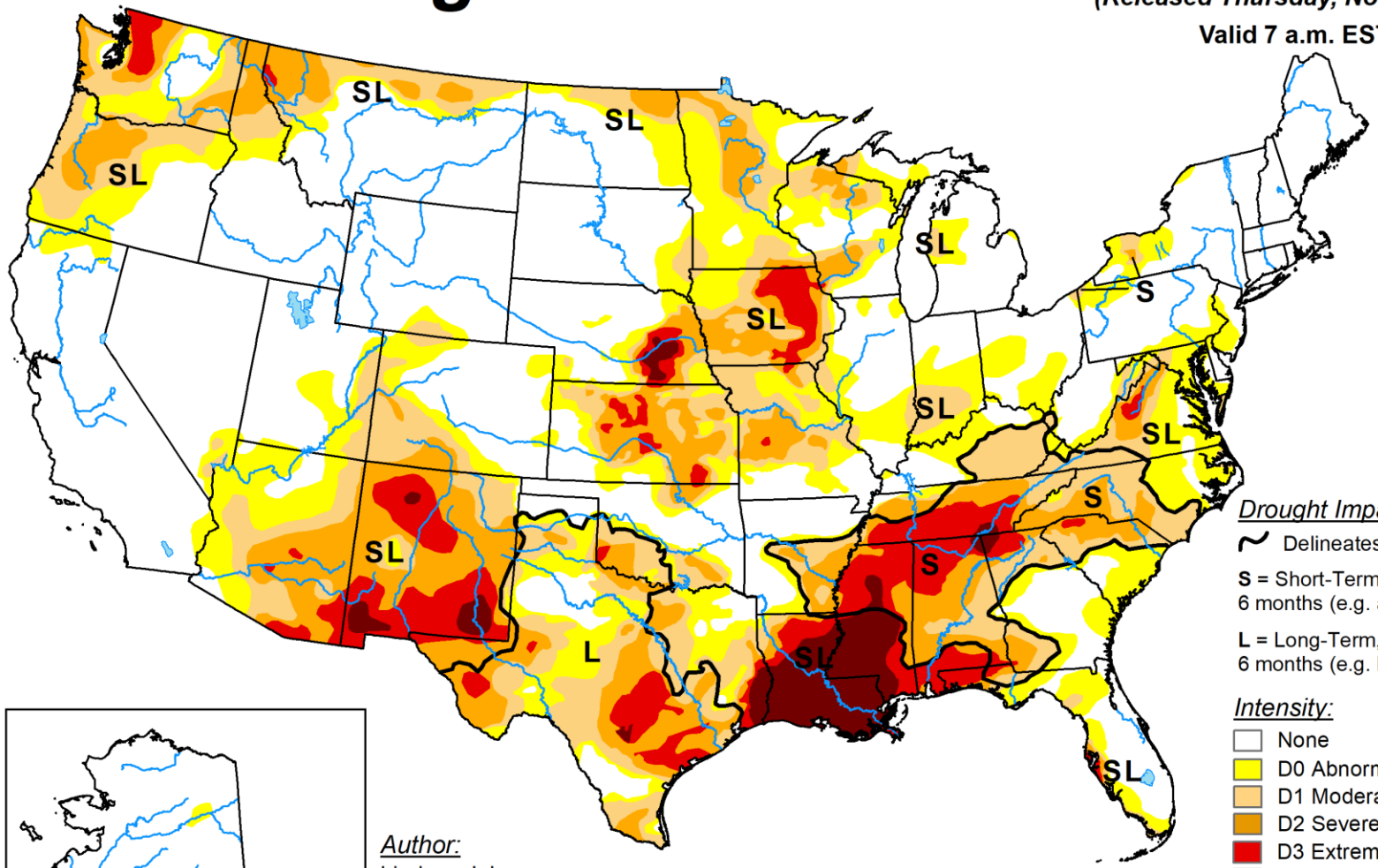
Data Source:
http://droughtmonitor.unl.edu/

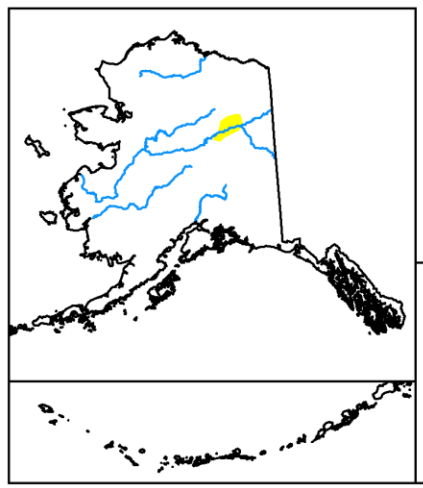
U.S. Drought Monitor

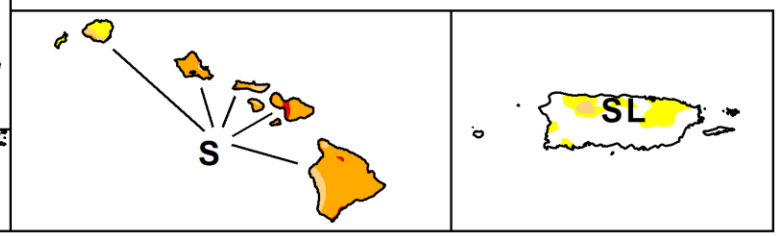
November 7, 2023

(Released Thursday, Nov. 9, 2023)

Valid 7 a.m. EST







Author:
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Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

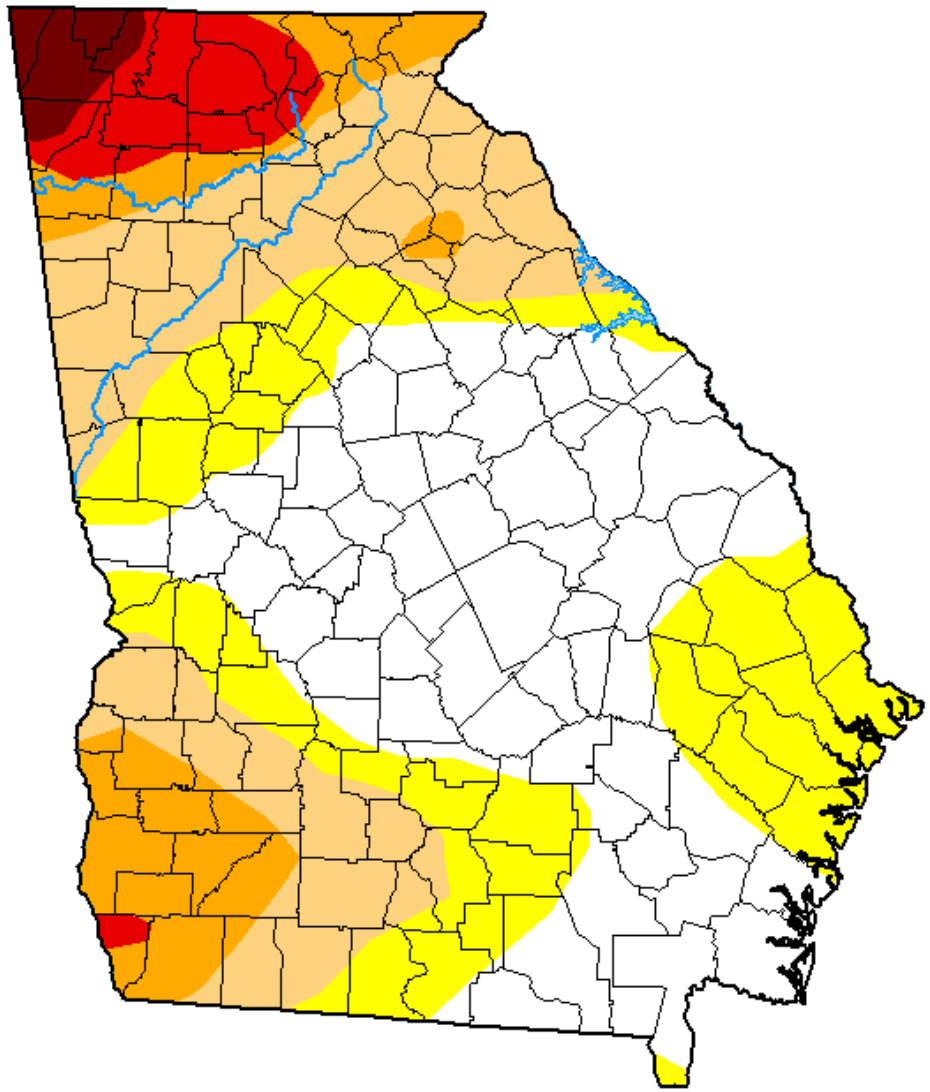
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

USDA NDMC NOAA

droughtmonitor.unl.edu

U.S. Drought Monitor

Georgia



November 7, 2023

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Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	39.48	60.52	37.42	15.97	6.59	1.82
Last Week *10-31-2023*	50.16	49.84	33.31	11.39	4.59	0.00
3 Months Ago *08-08-2023*	88.70	11.30	0.00	0.00	0.00	0.00
Start of Calendar Year *01-03-2023*	46.36	53.64	28.04	4.81	0.00	0.00
Start of Water Year *09-26-2023*	78.43	21.57	4.17	0.00	0.00	0.00
One Year Ago *11-08-2022*	15.32	84.68	51.88	28.92	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe 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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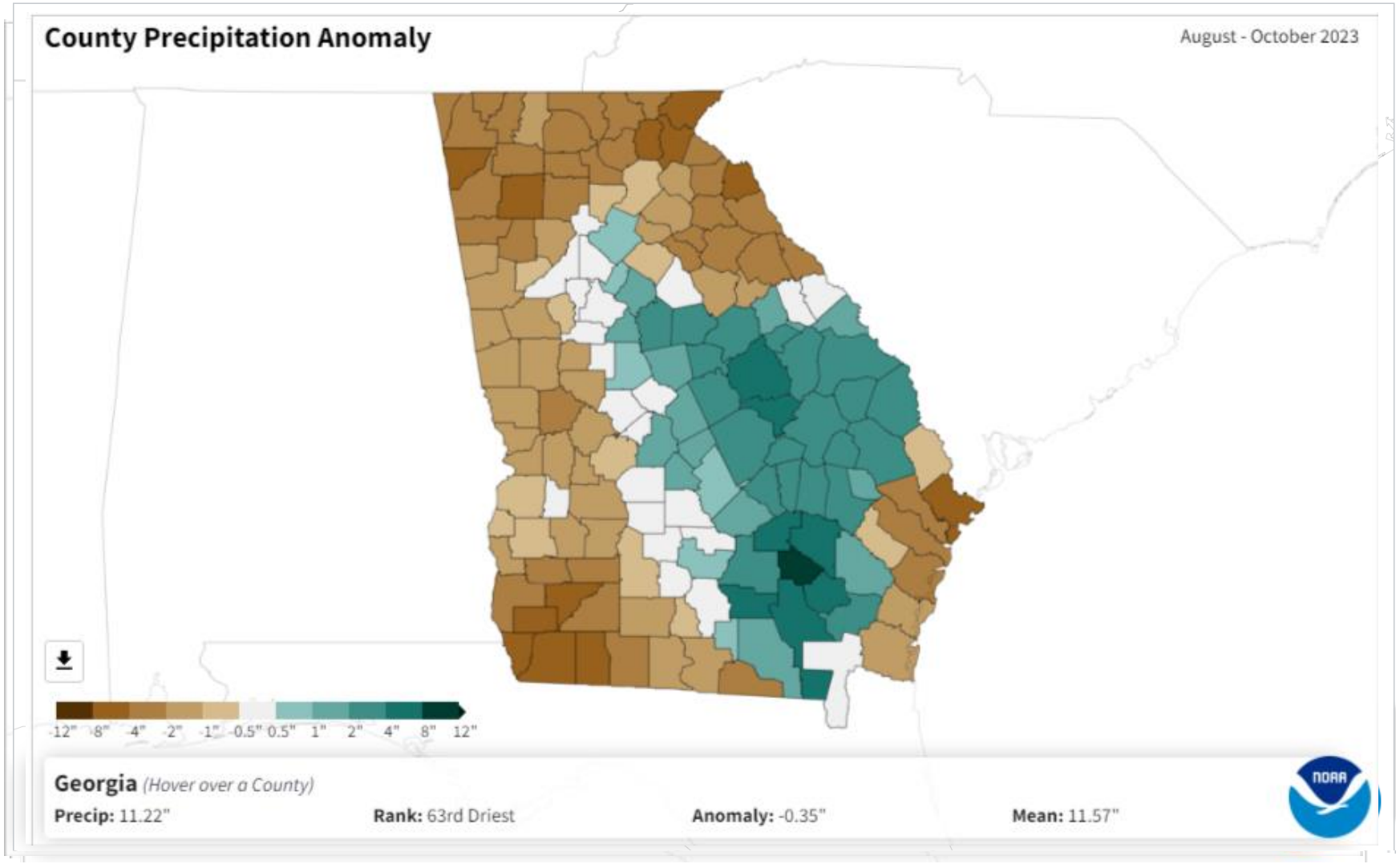
droughtmonitor.unl.edu

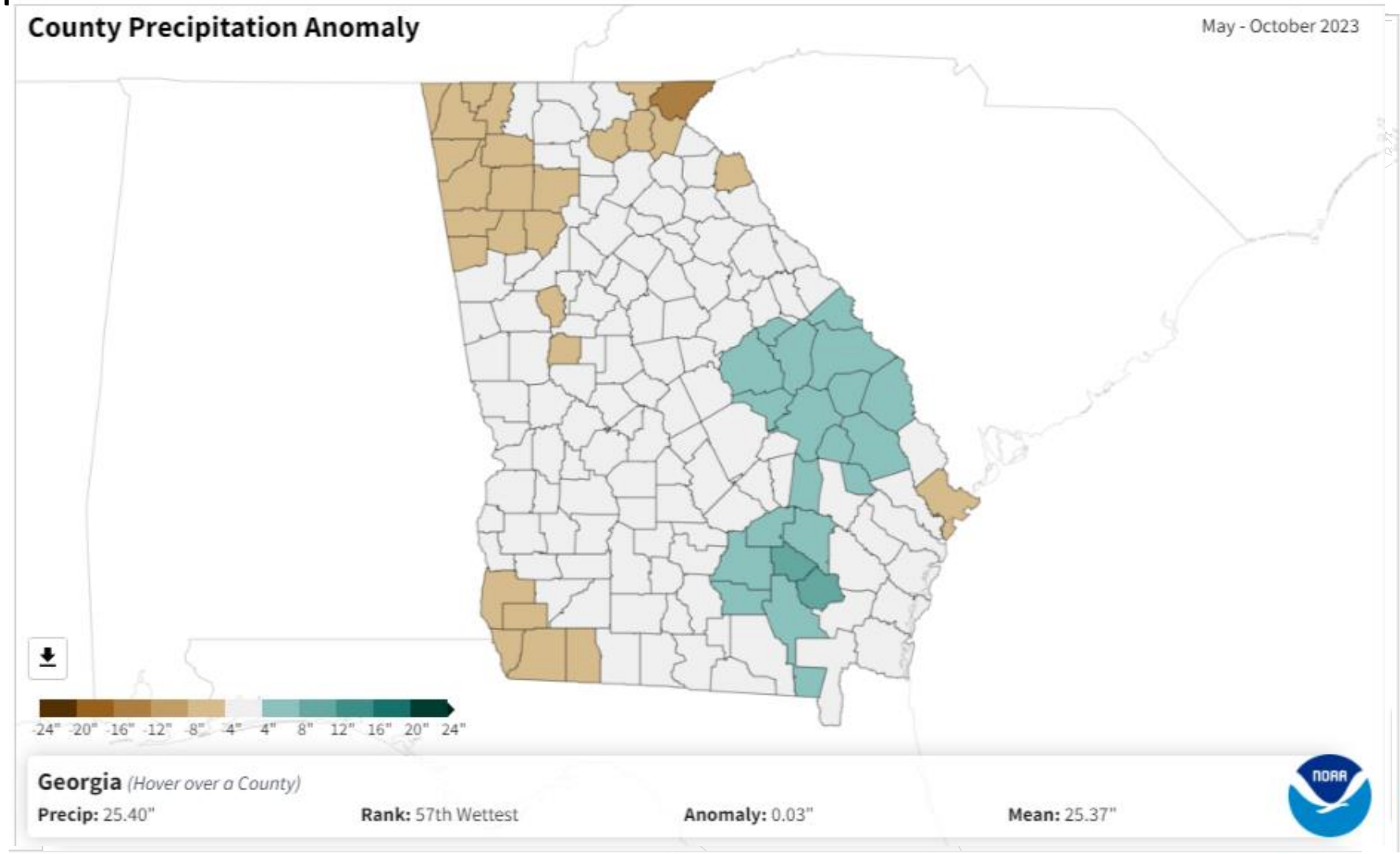
3, 6, and 12 Month Precipitation Anomaly

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

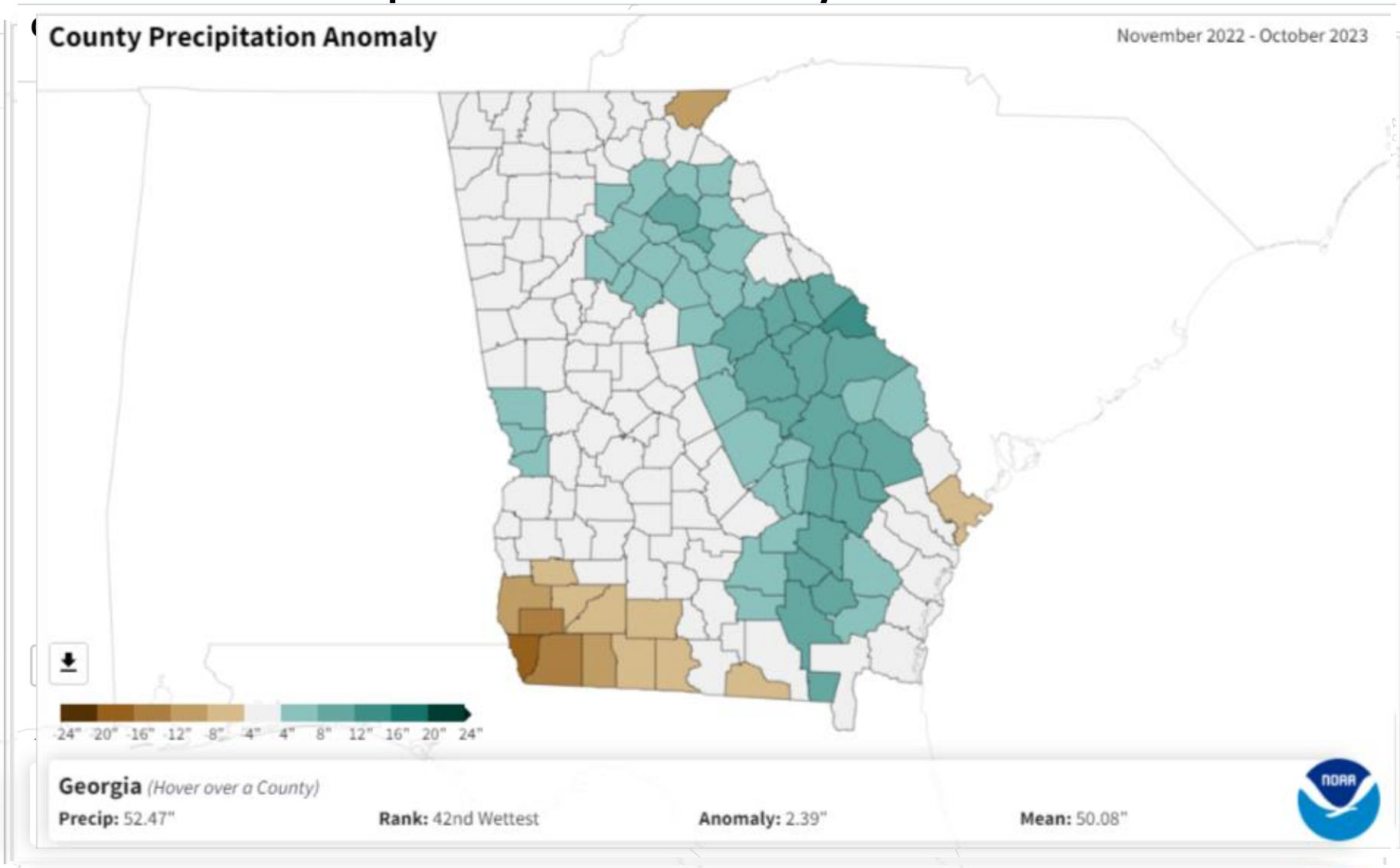
3 Month Precipitation Anomaly



6 Month Precipitation Anomaly



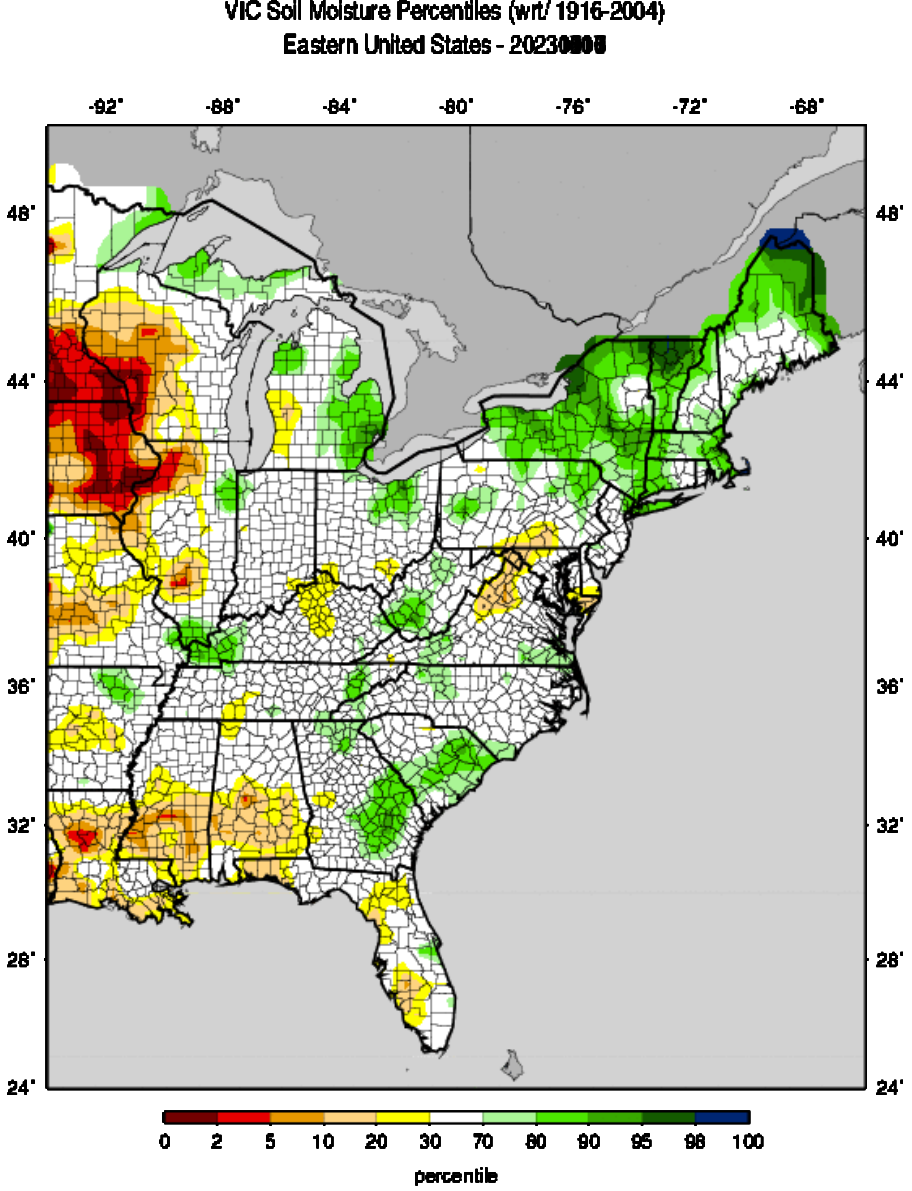
12 Month Precipitation Anomaly



Soil Moisture Conditions

Data Source:

http://www.hydro.ucla.edu/SurfaceWaterGroup/forecast/monitor/curr/conus.mexico/east.vic.sm_qnt.gif



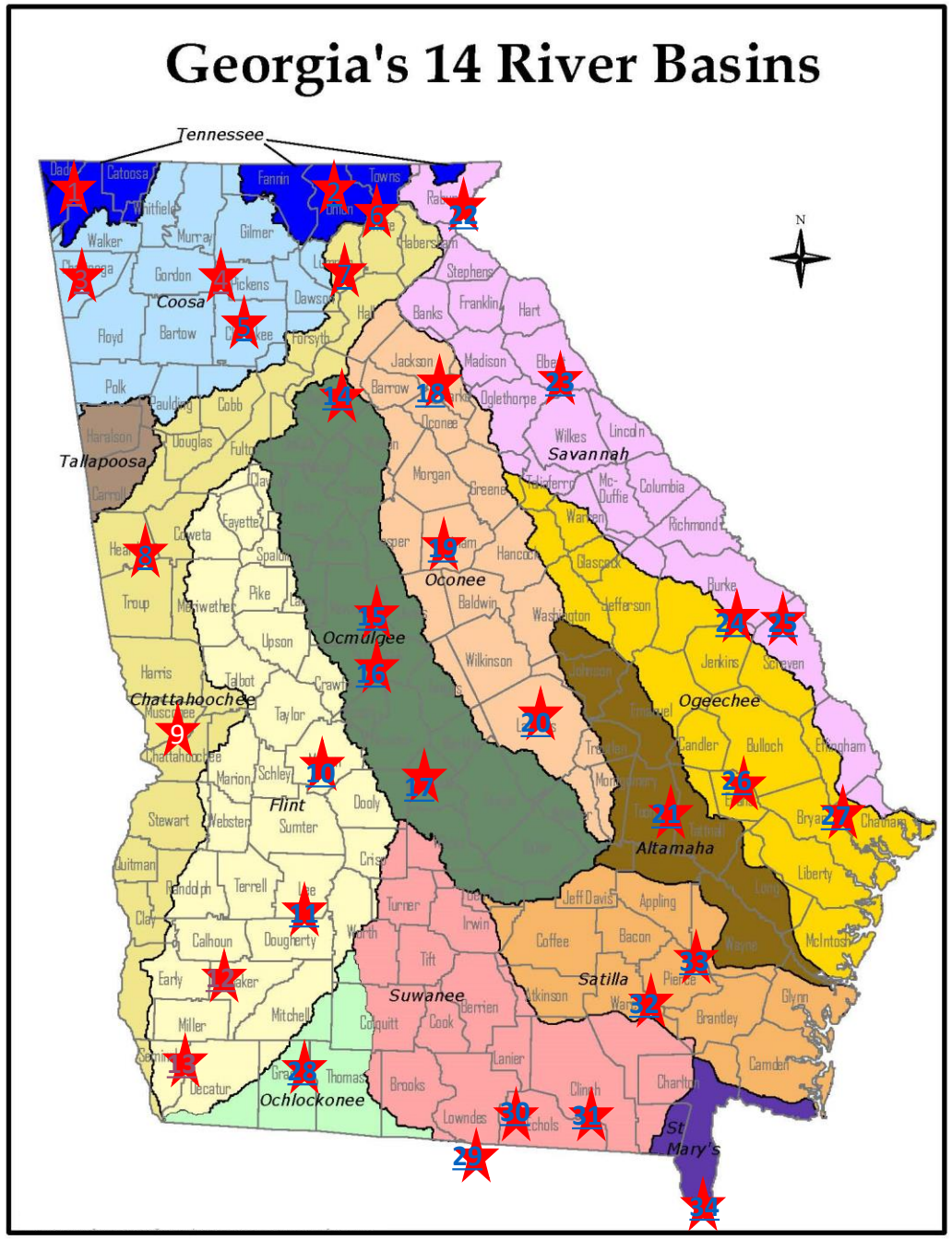
Current (Daily updated) percentiles for soil moisture (SWE) with respect to the climatological period (1916-2004).

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 2023 through October 2023;
- 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**

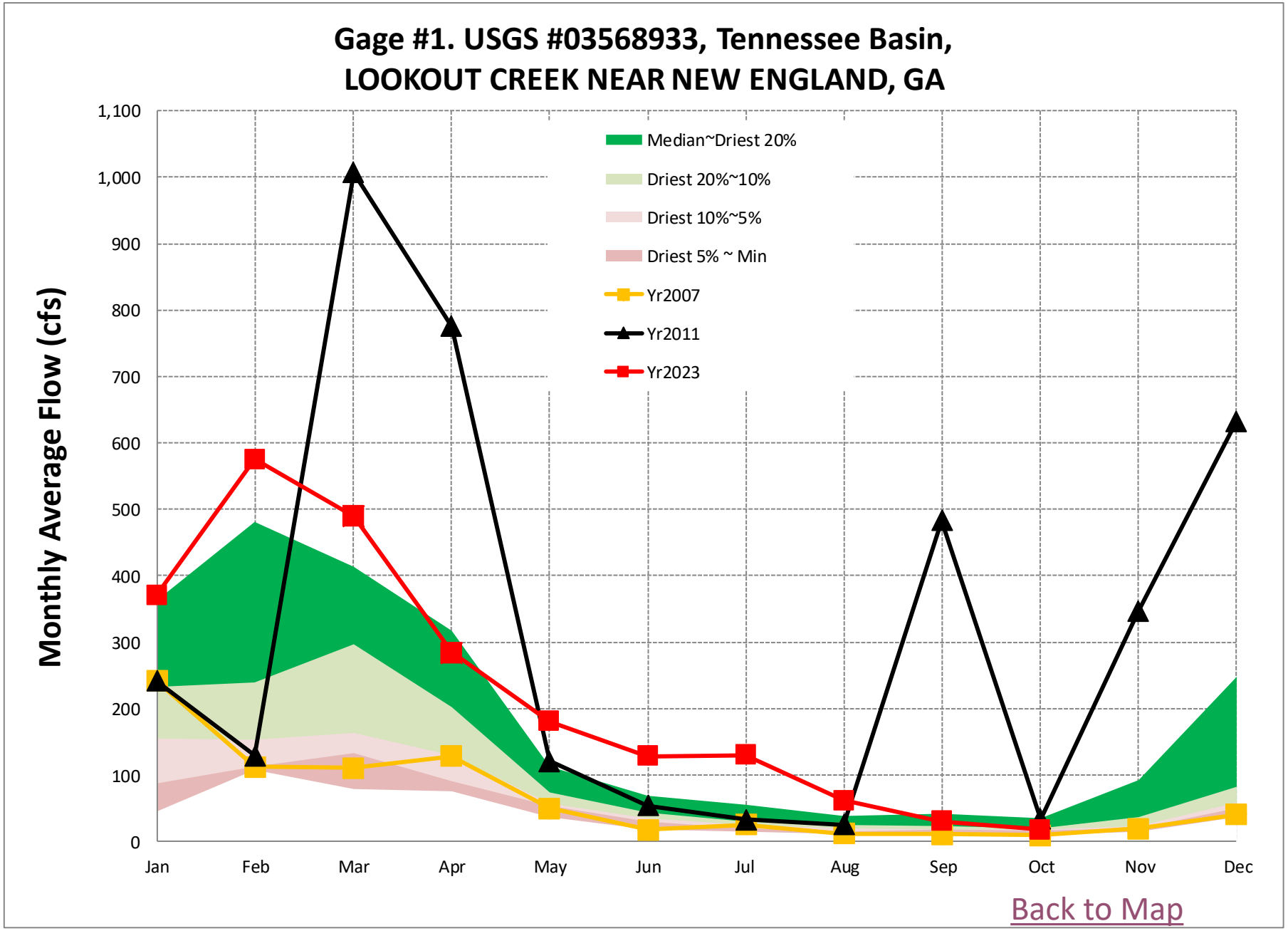
The streamflow graph for Gage #5, USGS Etowah River gage at Canton shows :

- Average stream flow in October 2023 was 268 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2023 about 9% of the time; 91% of the time in October it has been higher.
- Average stream flow in October 2011 was 236 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2011 about 5% of the time; 95% of the time in October it has been higher.
- Average stream flow in October 2007 was 150 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2007 about 0.1 % of the time; 99.9 % of the time in October it has been higher.

How to Read the Streamflow Graphs
Example #2: Flint River at Albany

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

- Average stream flow in October 2023 was 1585 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2023 about 16% of the time; about 84% of the time in October it has been higher.
- Average stream flow in October 2011 was 976 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2011 about 0.1~1 % of the time; about 99~99.9% of the time in October it has been higher.
- Average stream flow in October 2007 was 1104 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2007 about 2~5% of the time; about 95~98% of the time in October it has been higher.


Gage #1. USGS #03568933, Tennessee Basin,
LOOKOUT CREEK NEAR NEW ENGLAND, GA
Monthly Average Flow (cfs)
1,100
1,000
900
800
700
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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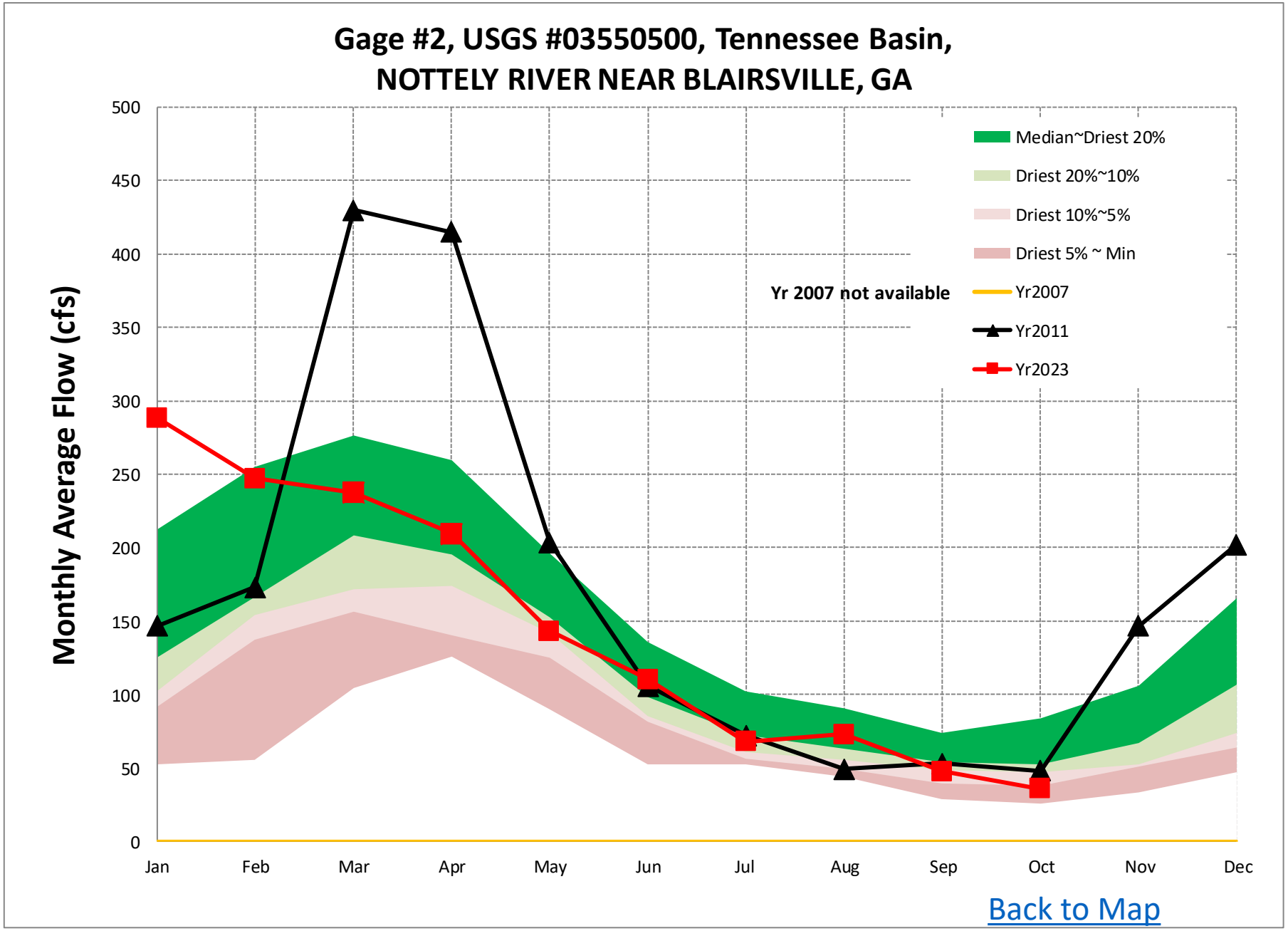
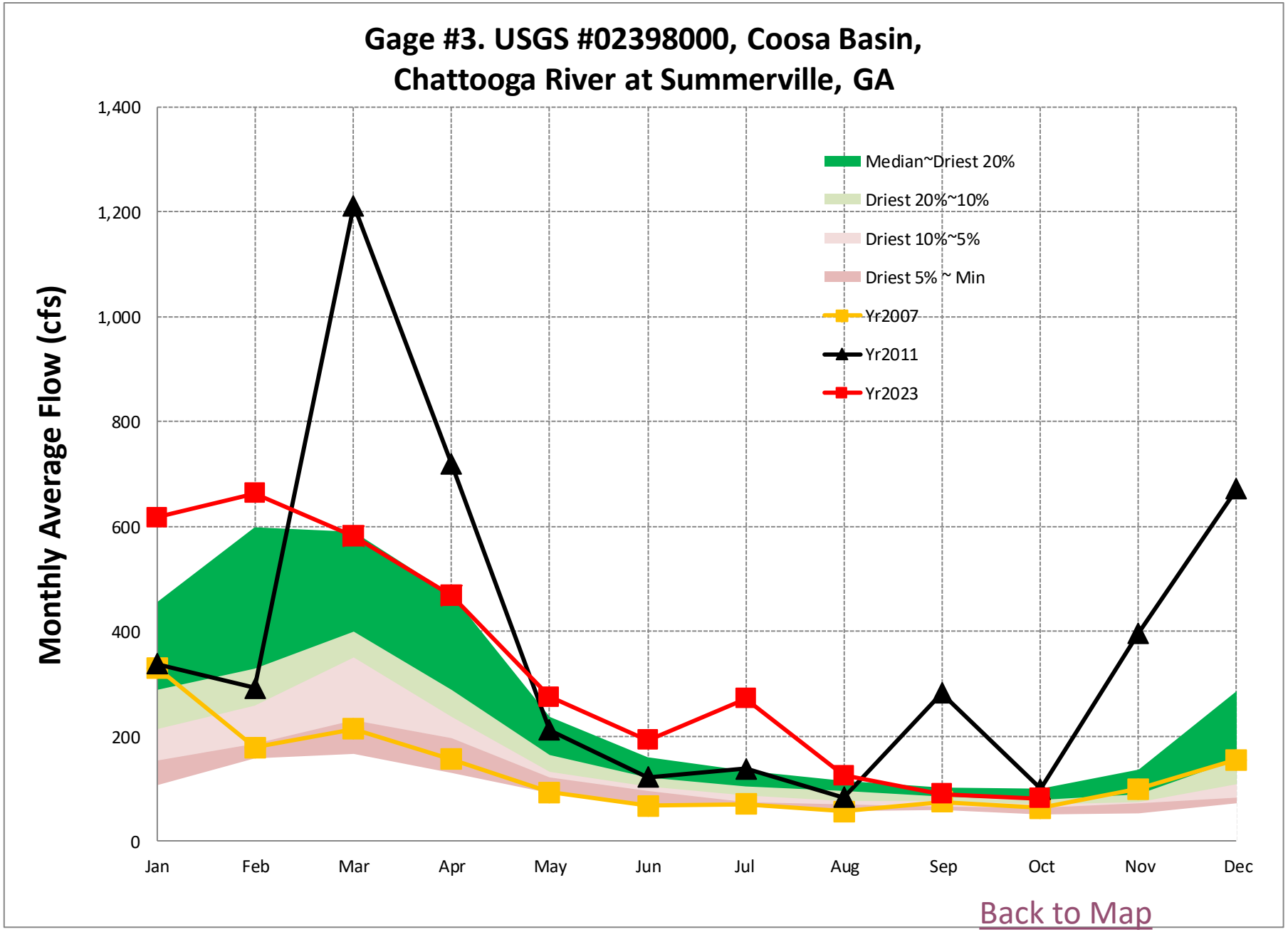

Gage #2, USGS #03550500, Tennessee Basin,
NOTTELY RIVER NEAR BLAIRSVILLE, GA
Monthly Average Flow (cfs)
500
450
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023
Yr 2007 not available
Back to Map


Gage #3. USGS #02398000, Coosa Basin,
Chattooga River at Summerville, GA
Monthly Average Flow (cfs)
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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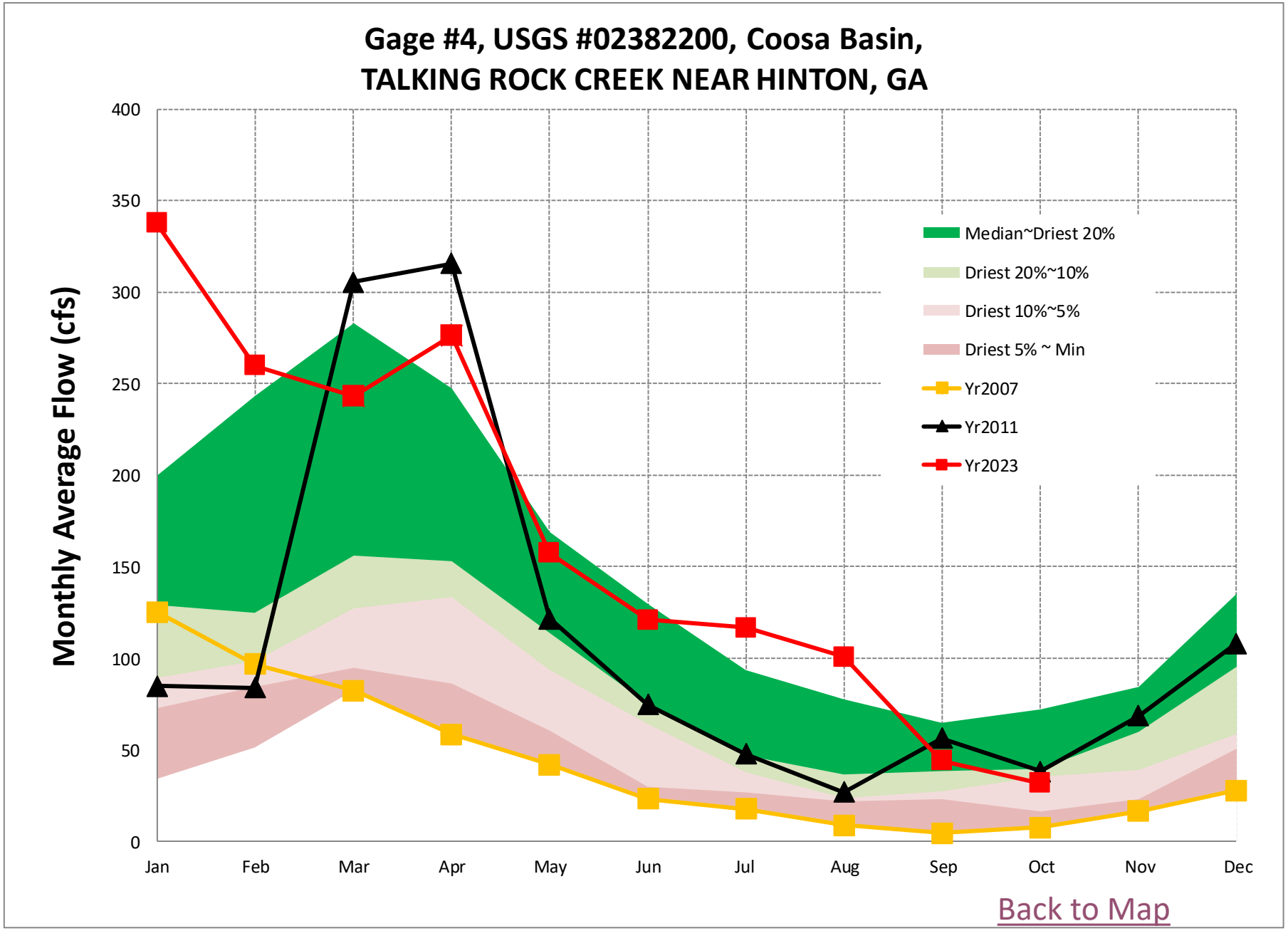
Gage #4, USGS #02382200, Coosa Basin,
TALKING ROCK CREEK NEAR HINTON, GA
Monthly Average Flow (cfs)
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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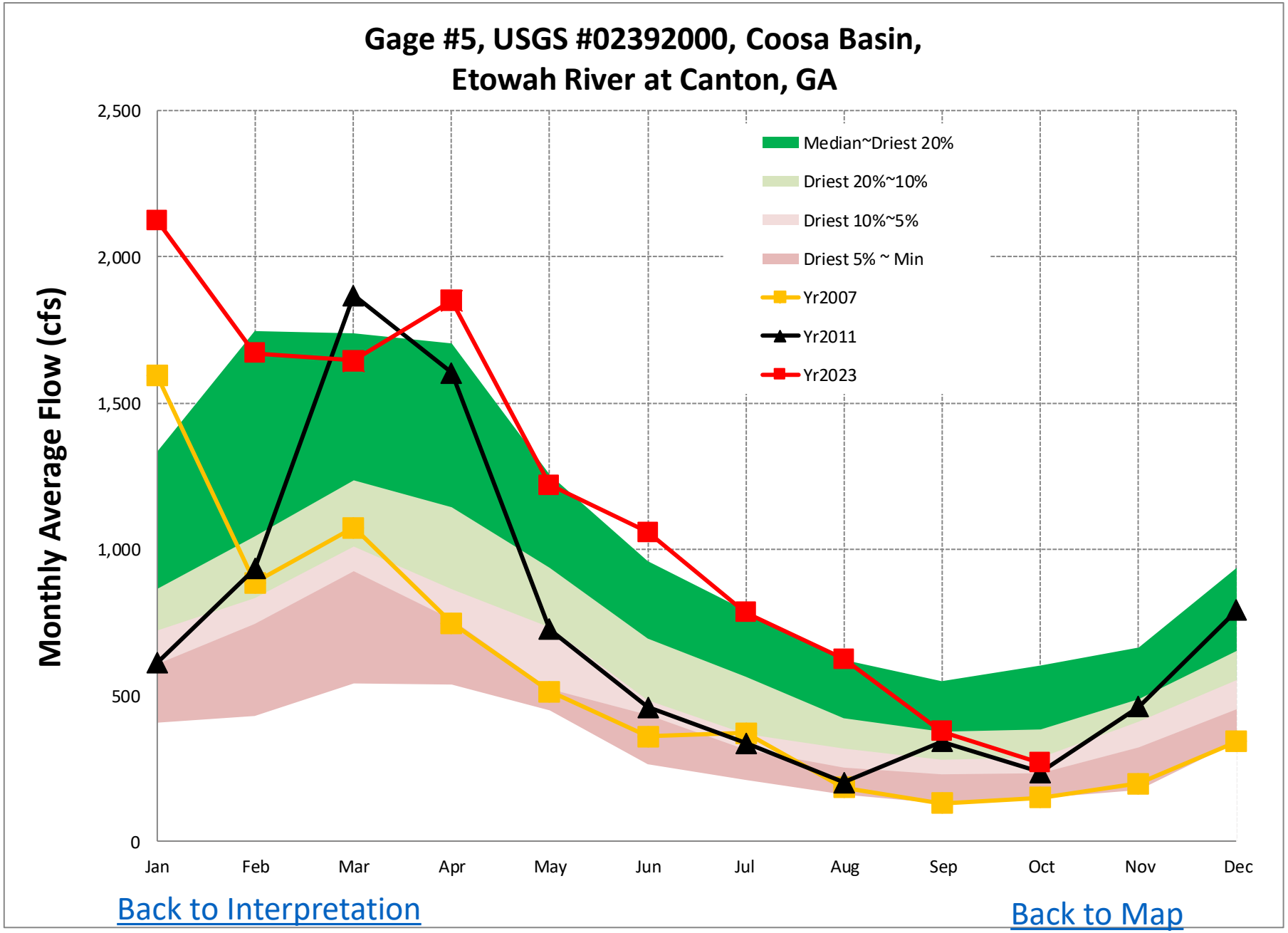

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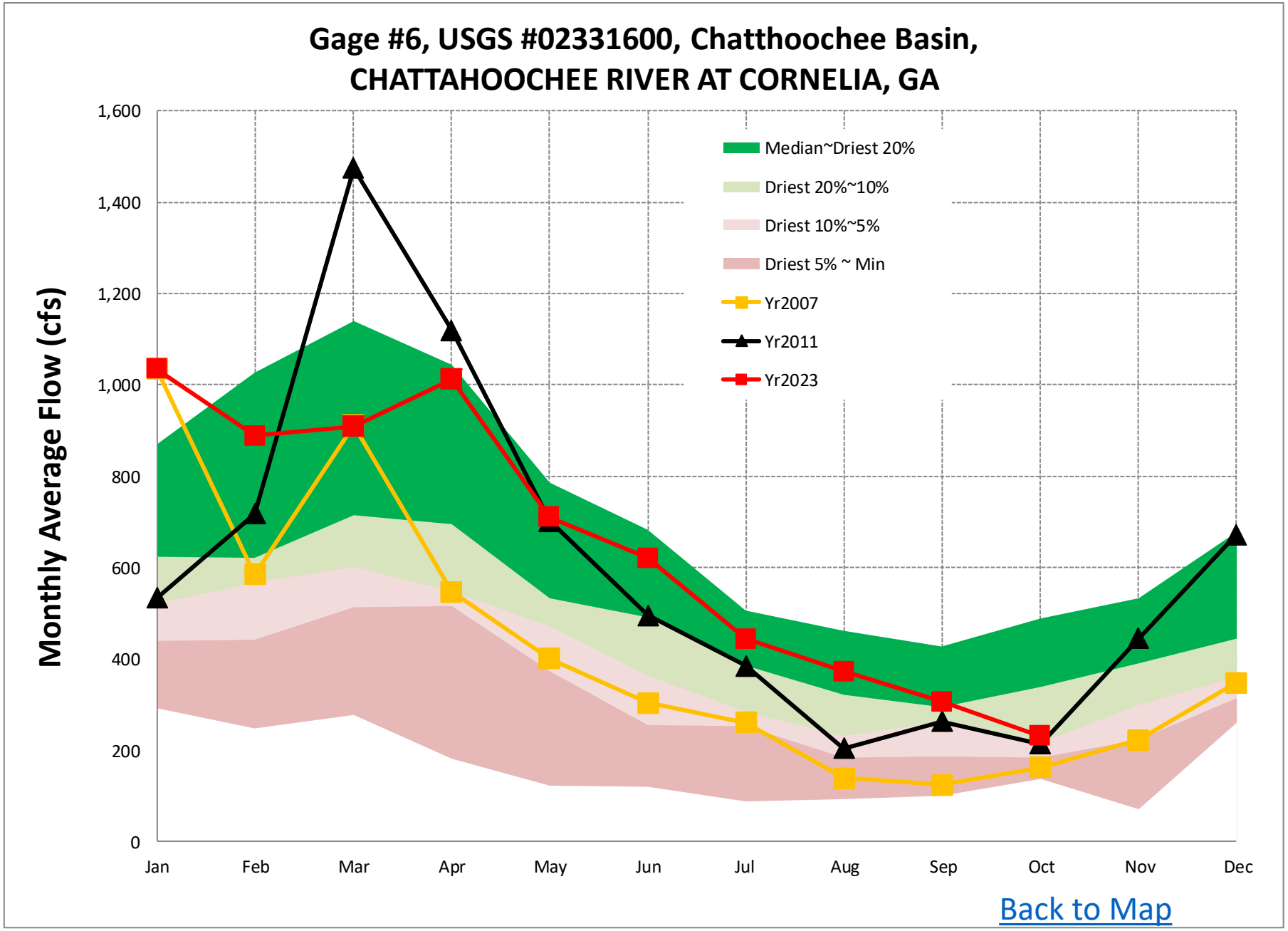
Gage #6, USGS #02331600, Chatthoochee Basin,
CHATTAHOOCHEE RIVER AT CORNELIA, GA
Monthly Average Flow (cfs)
1,600
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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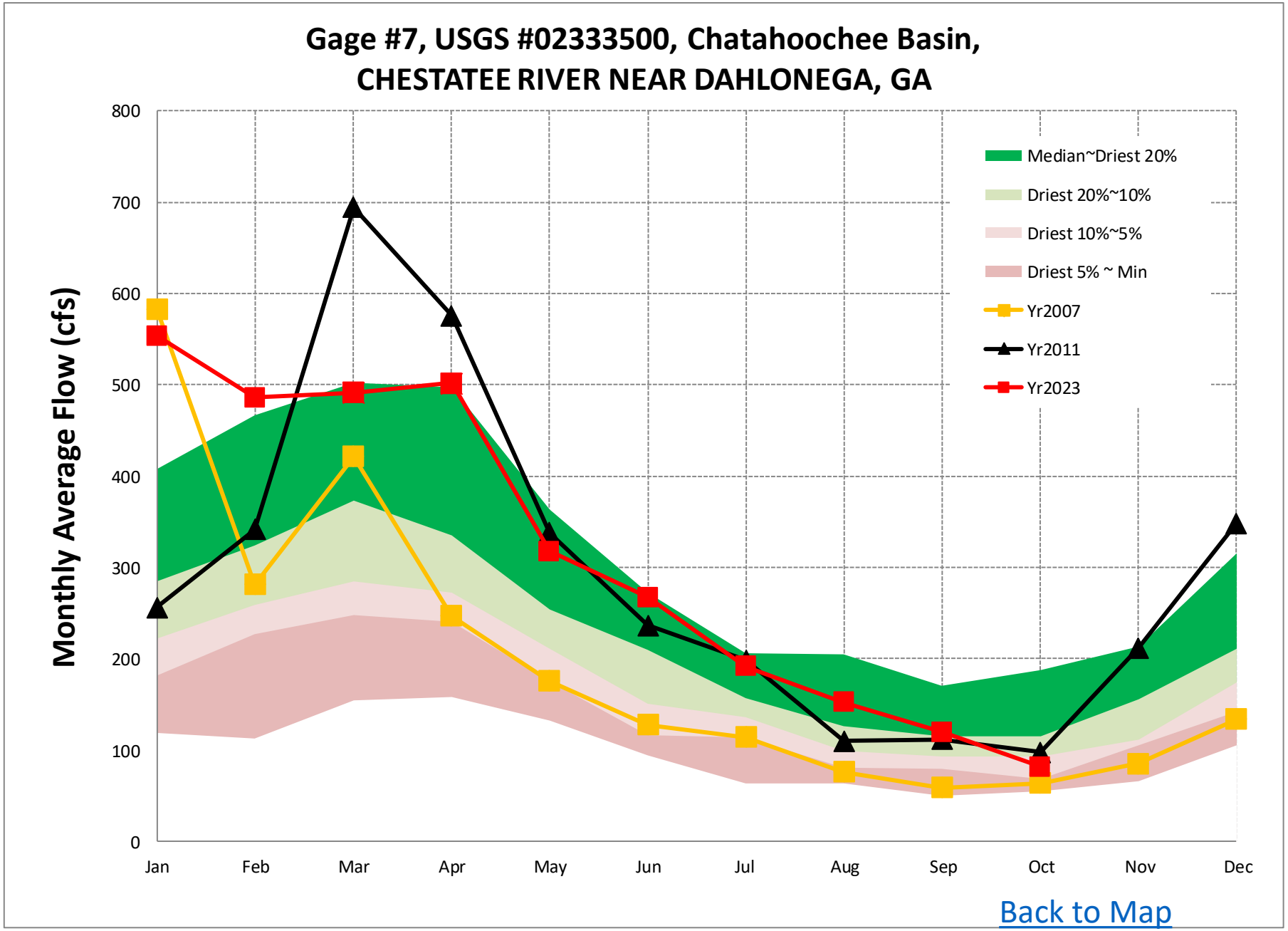
Gage #7, USGS #02333500, Chatahoochee Basin,
CHESTATEE RIVER NEAR DAHLONEGA, GA
Monthly Average Flow (cfs)
800
700
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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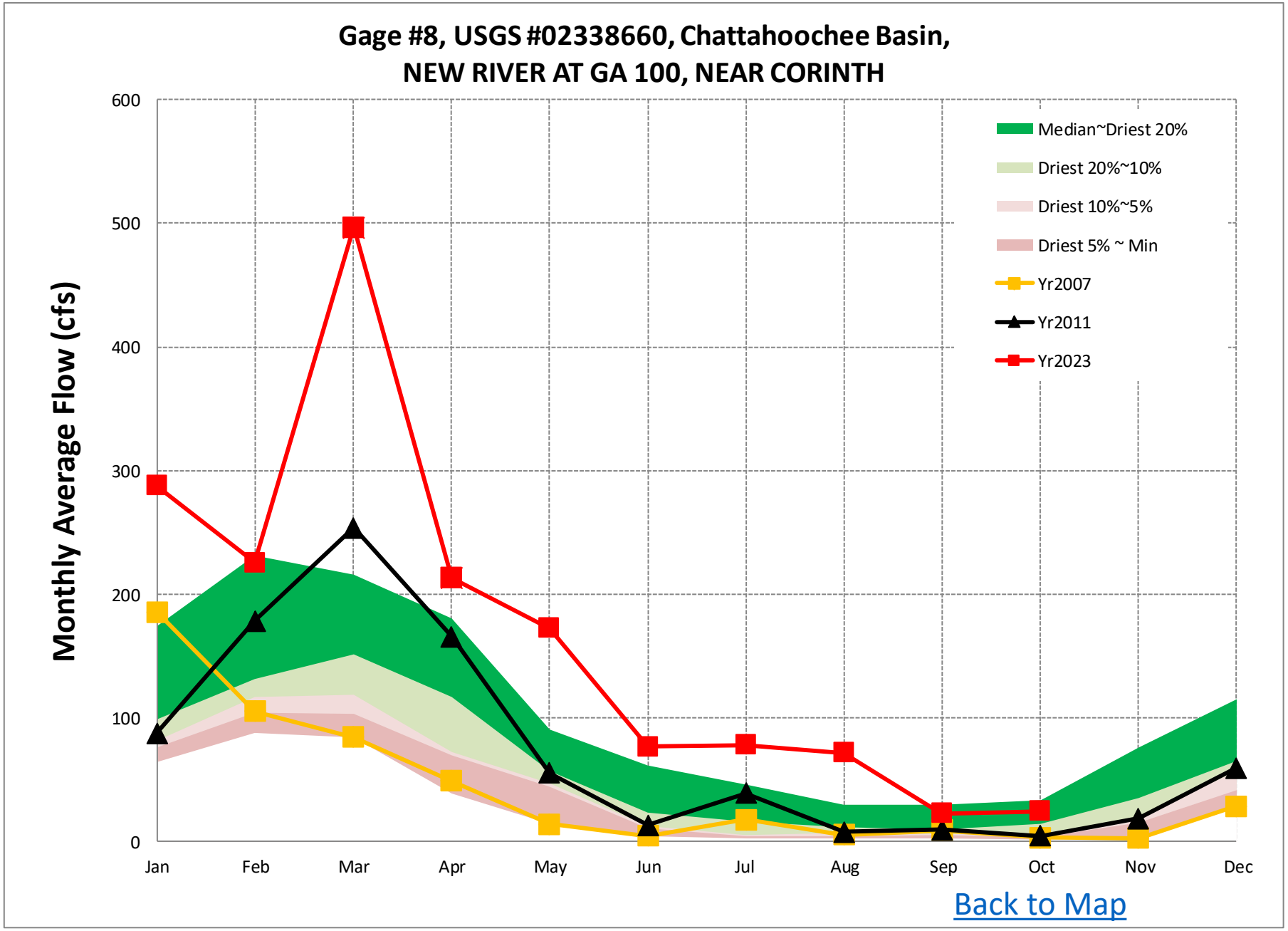
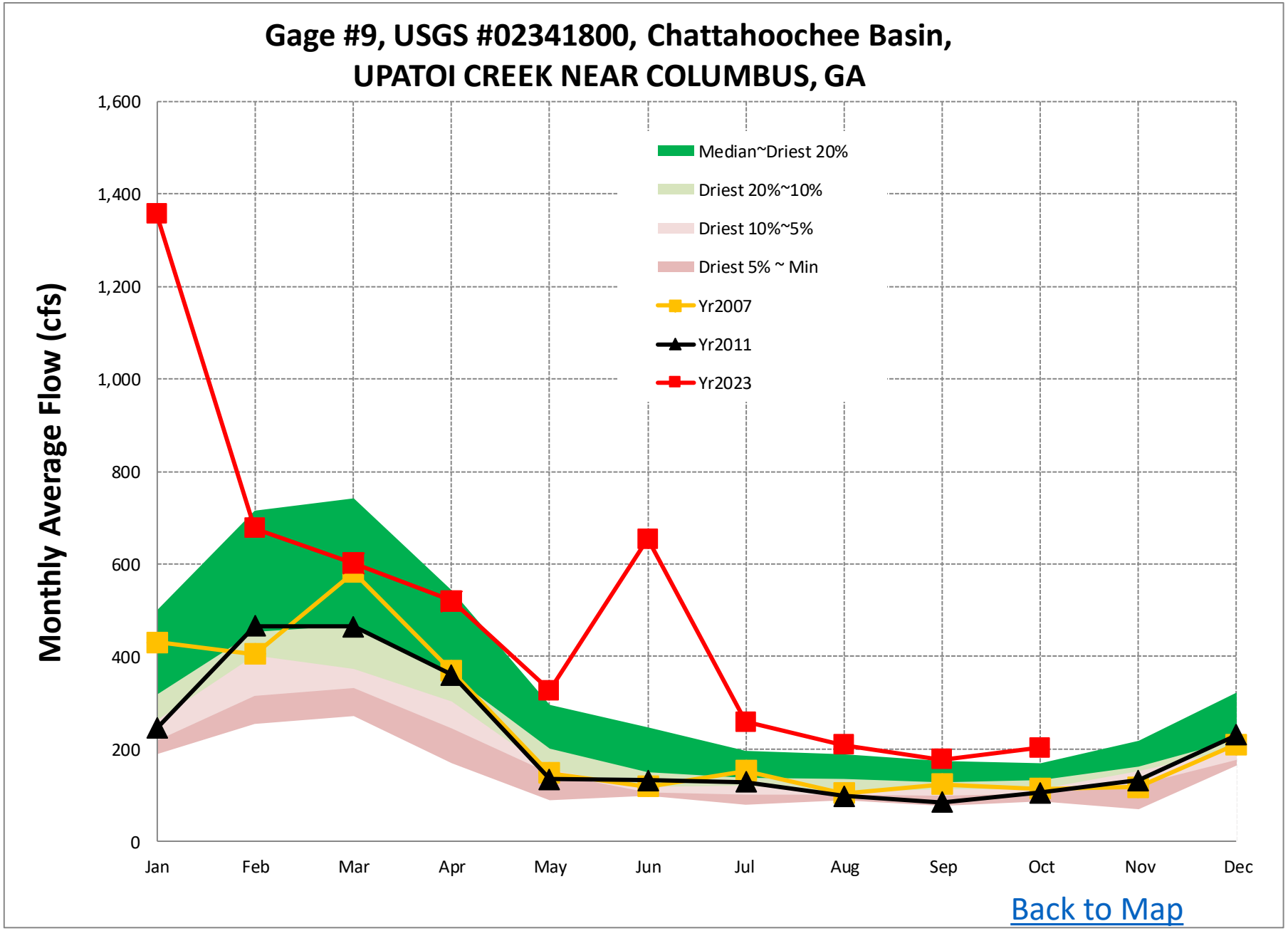

Gage #8, USGS #02338660, Chattahoochee Basin,
NEW RIVER AT GA 100, NEAR CORINTH
Monthly Average Flow (cfs)
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

Back to Map


Gage #9, USGS #02341800, Chattahoochee Basin,
UPATOI CREEK NEAR COLUMBUS, GA
Monthly Average Flow (cfs)
1,600
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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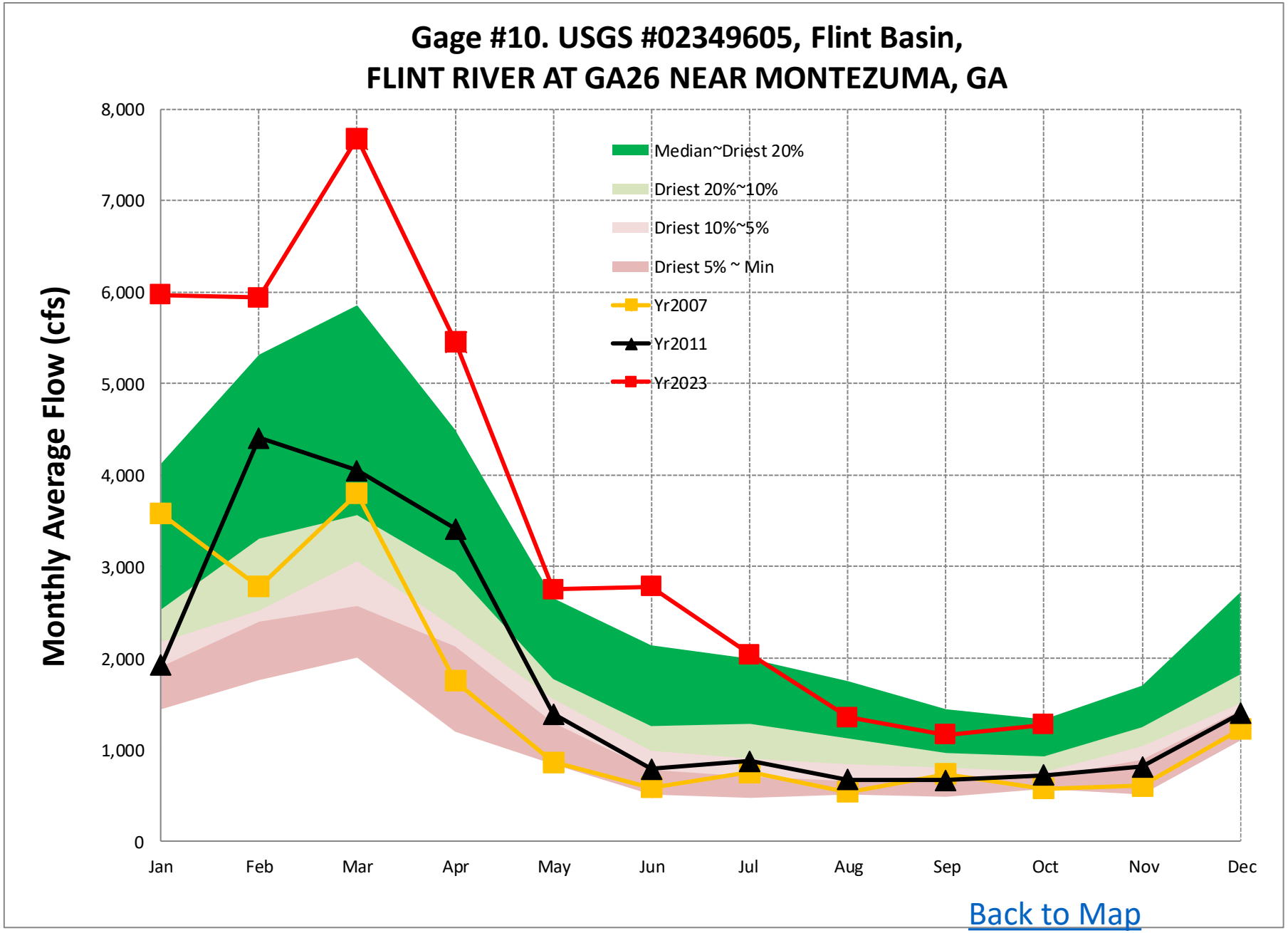
Gage #10. USGS #02349605, Flint Basin,
FLINT RIVER AT GA26 NEAR MONTEZUMA, GA
Monthly Average Flow (cfs)
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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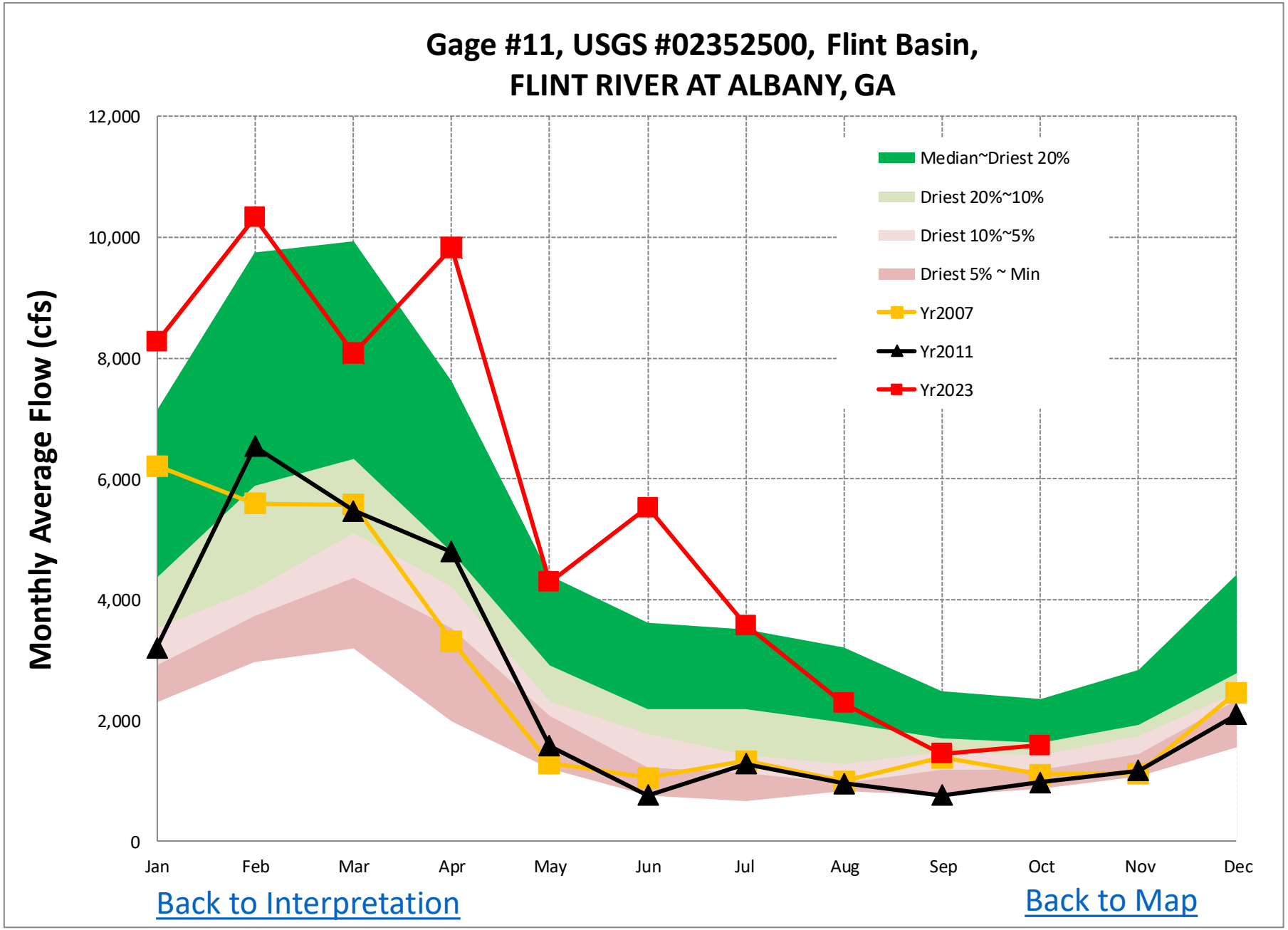

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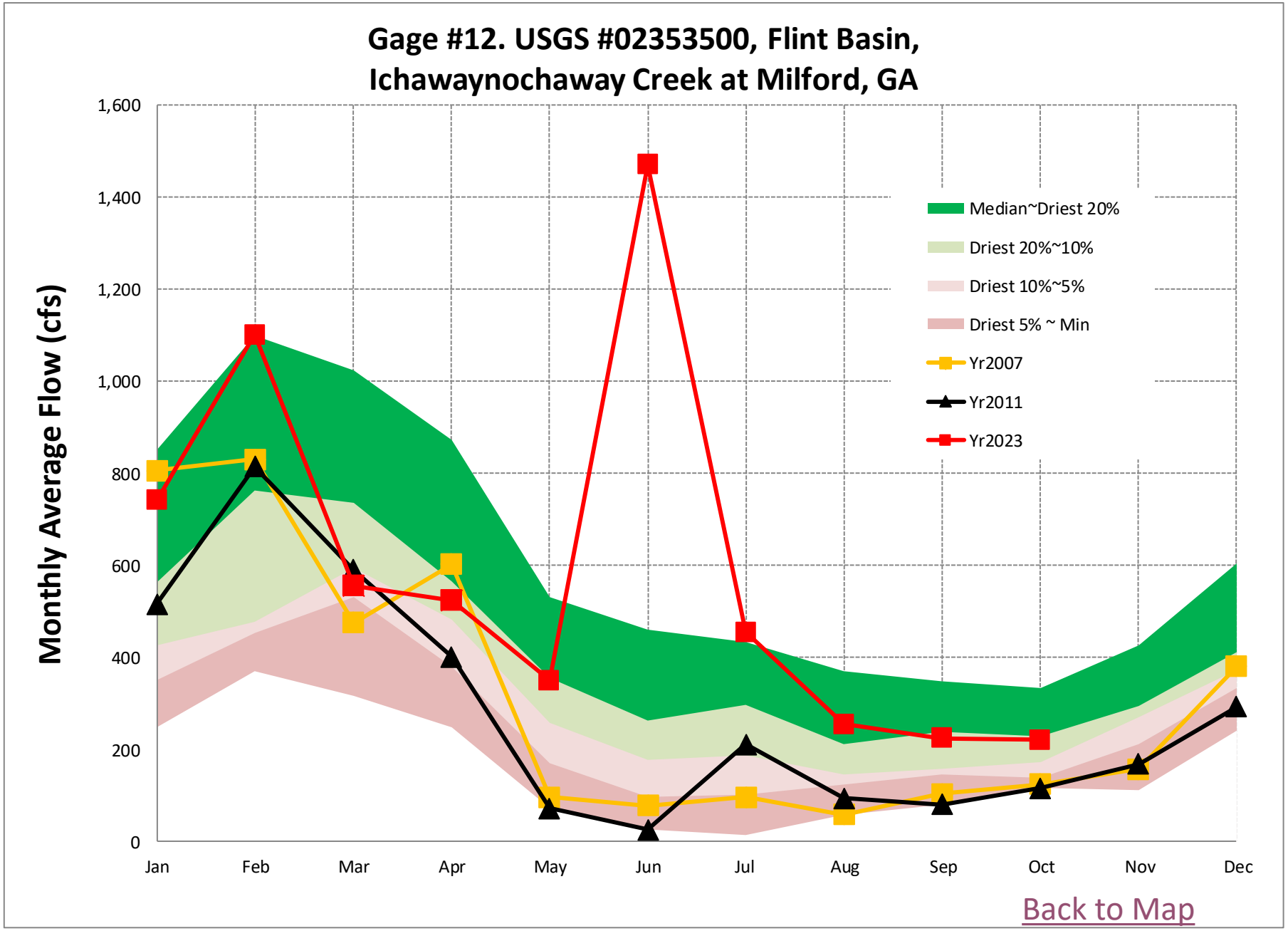
Gage #12. USGS #02353500, Flint Basin,
Ichawaynochaway Creek at Milford, GA
Monthly Average Flow (cfs)
1,600
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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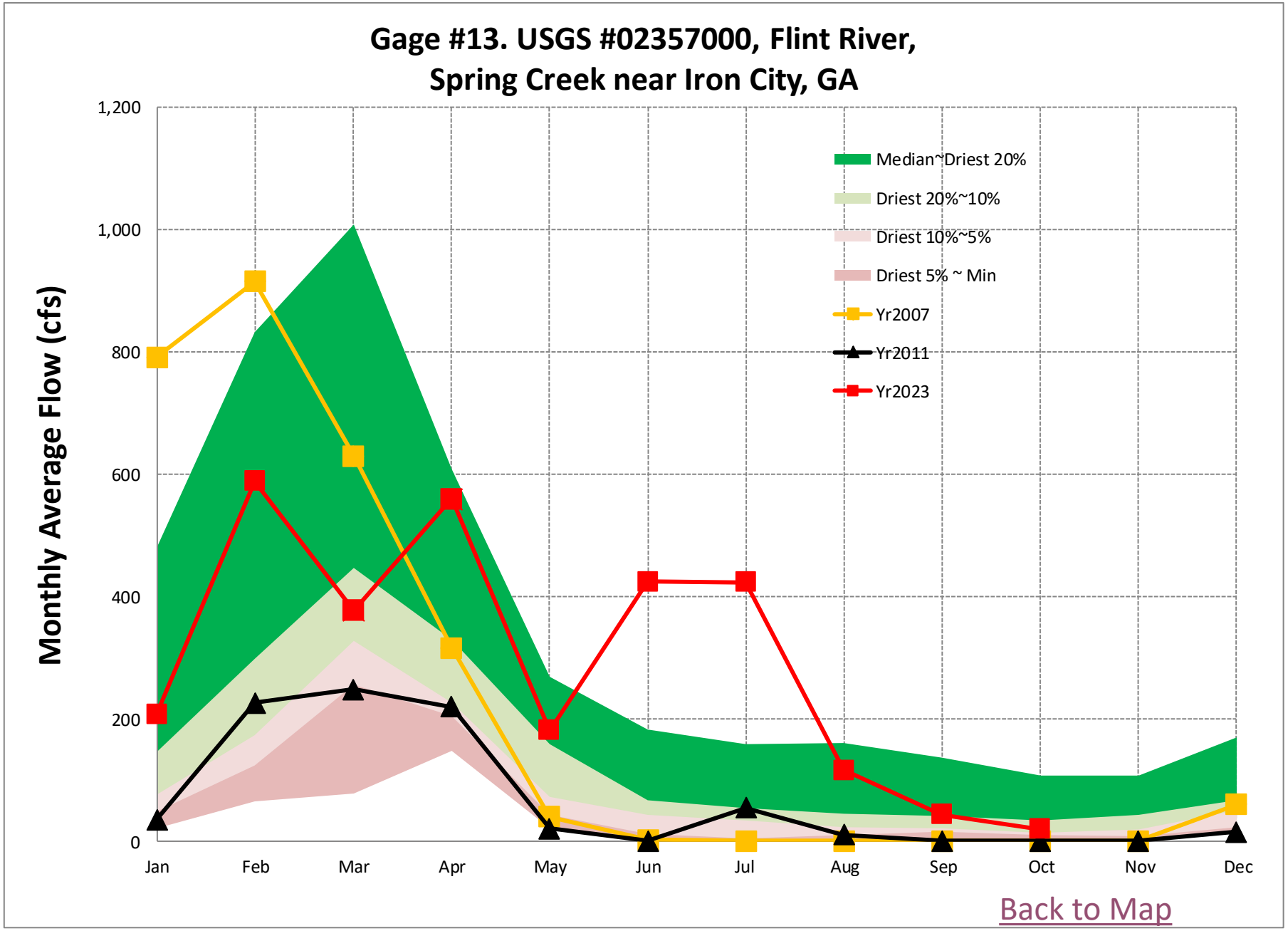
Gage #13. USGS #02357000, Flint River,
Spring Creek near Iron City, GA
Monthly Average Flow (cfs)
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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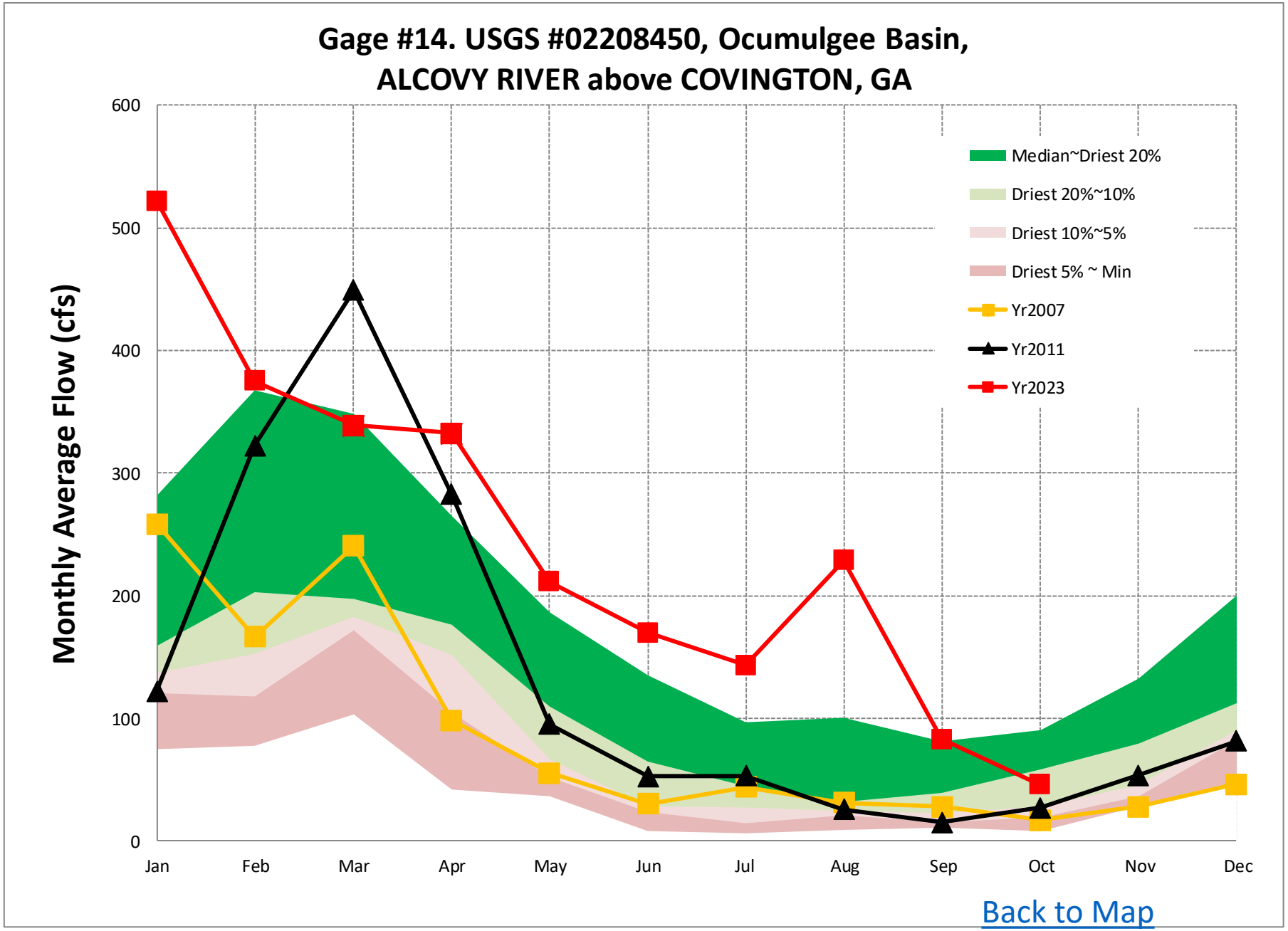
Gage #14. USGS #02208450, Ocumulgee Basin,
ALCOVY RIVER above COVINGTON, GA
Monthly Average Flow (cfs)
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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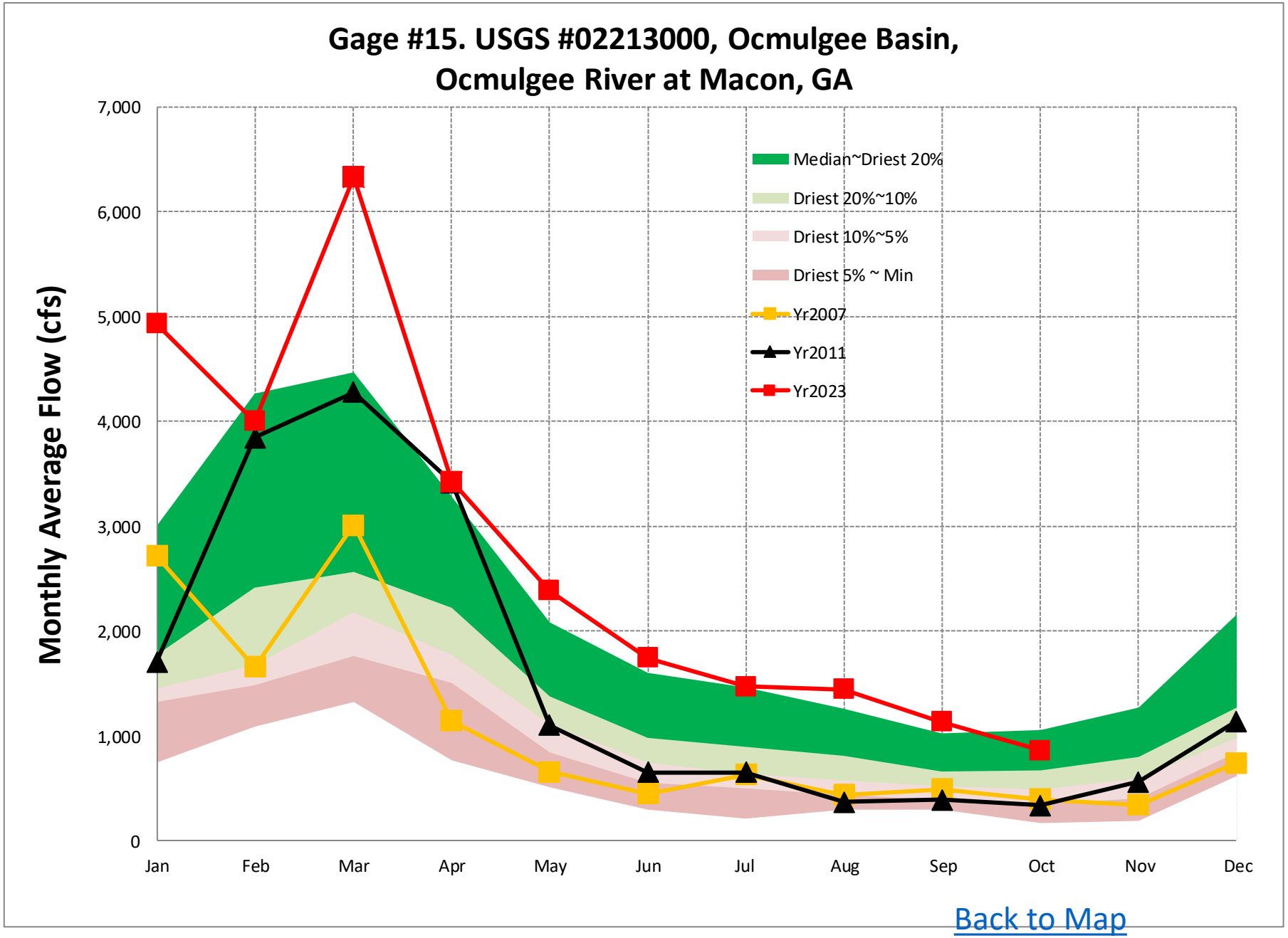
Gage #15. USGS #02213000, Ocmulgee Basin,
Ocmulgee River at Macon, GA
Monthly Average Flow (cfs)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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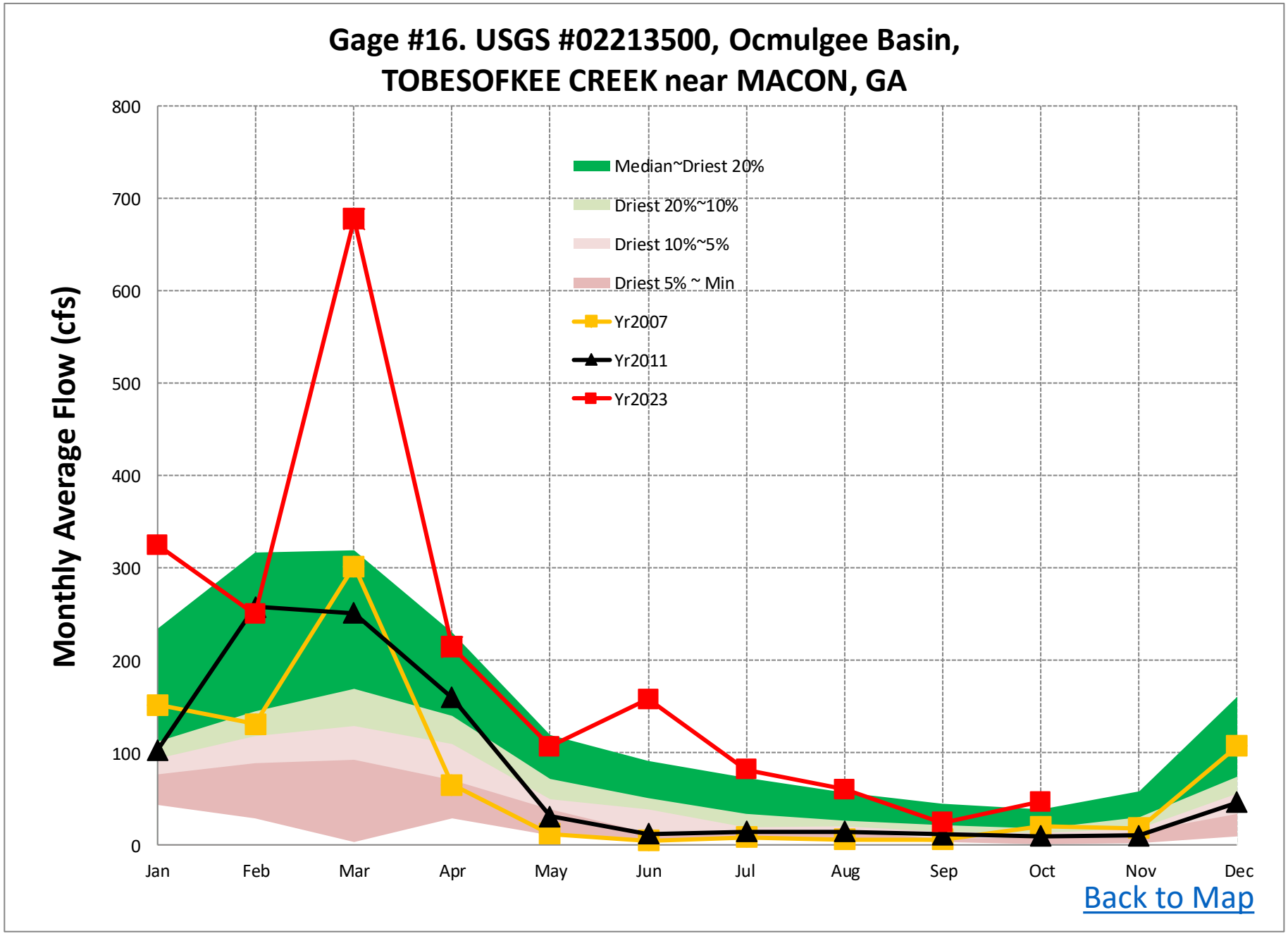
Gage #16. USGS #02213500, Ocmulgee Basin,
TOBESOFKEE CREEK near MACON, GA
Monthly Average Flow (cfs)
800
700
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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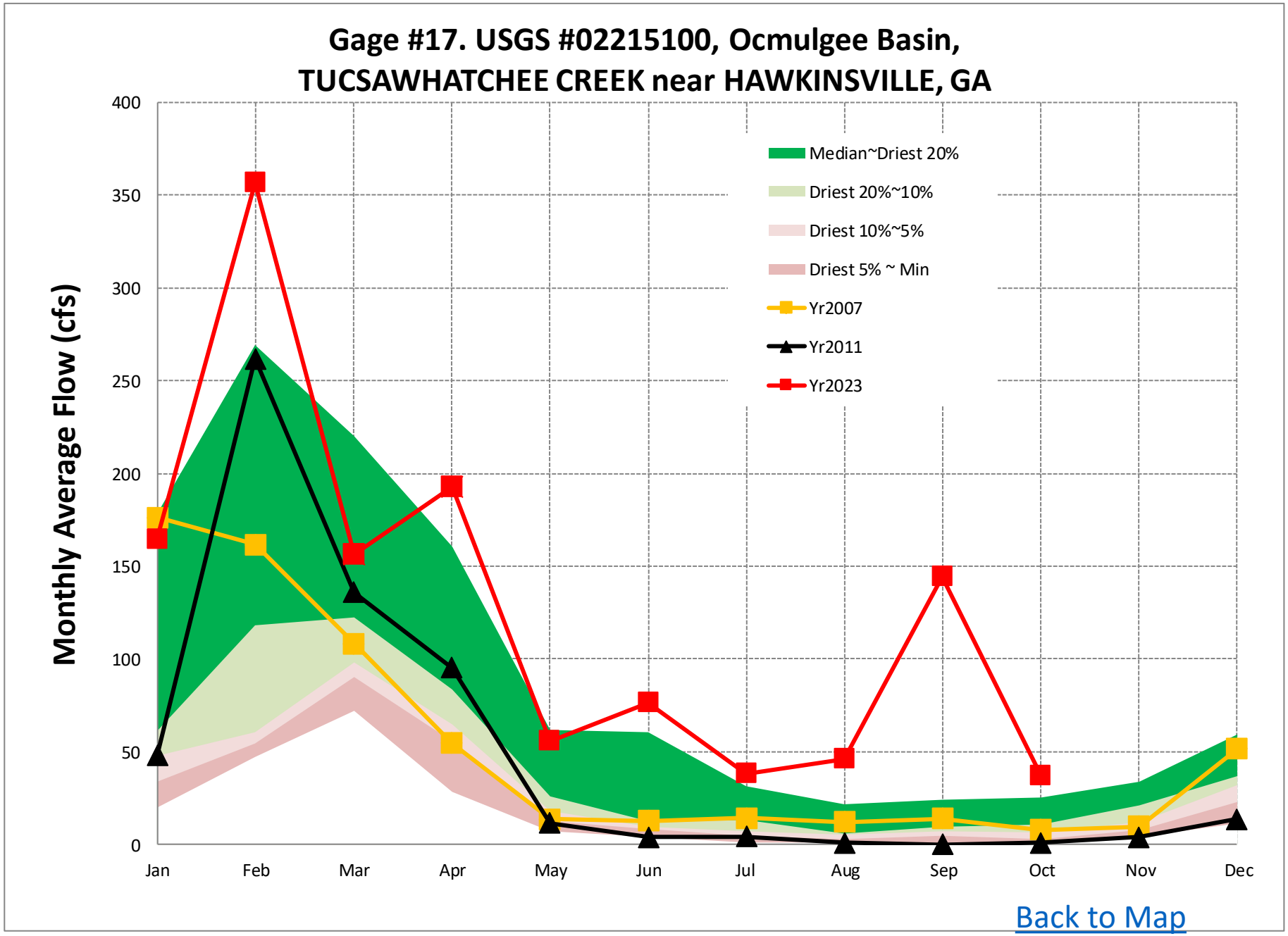
Gage #17. USGS #02215100, Ocmulgee Basin,
TUCSAWHATCHEE CREEK near HAWKINSVILLE, GA
Monthly Average Flow (cfs)
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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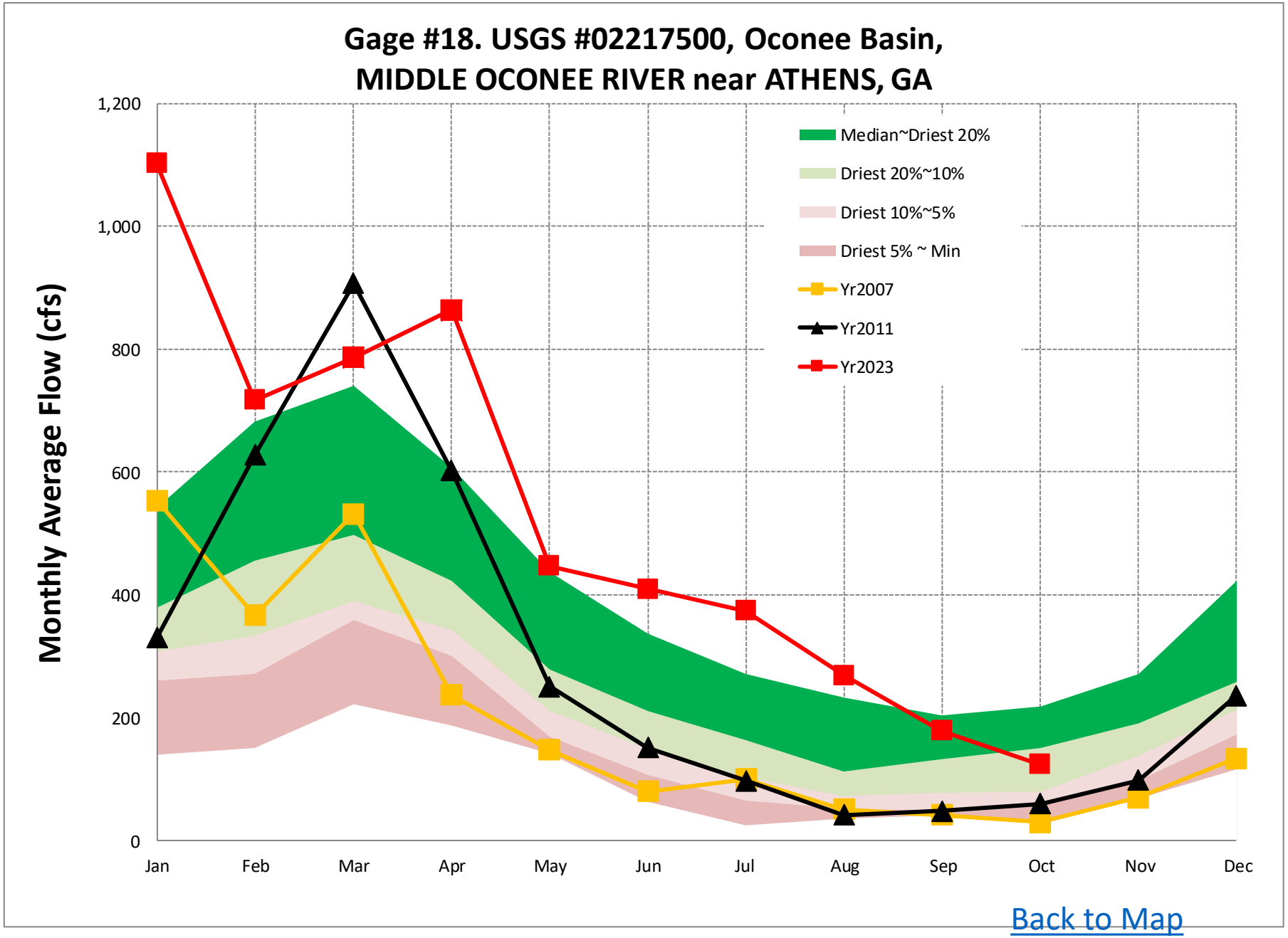
Gage #18. USGS #02217500, Oconee Basin,
MIDDLE OCONEE RIVER near ATHENS, GA
Monthly Average Flow (cfs)
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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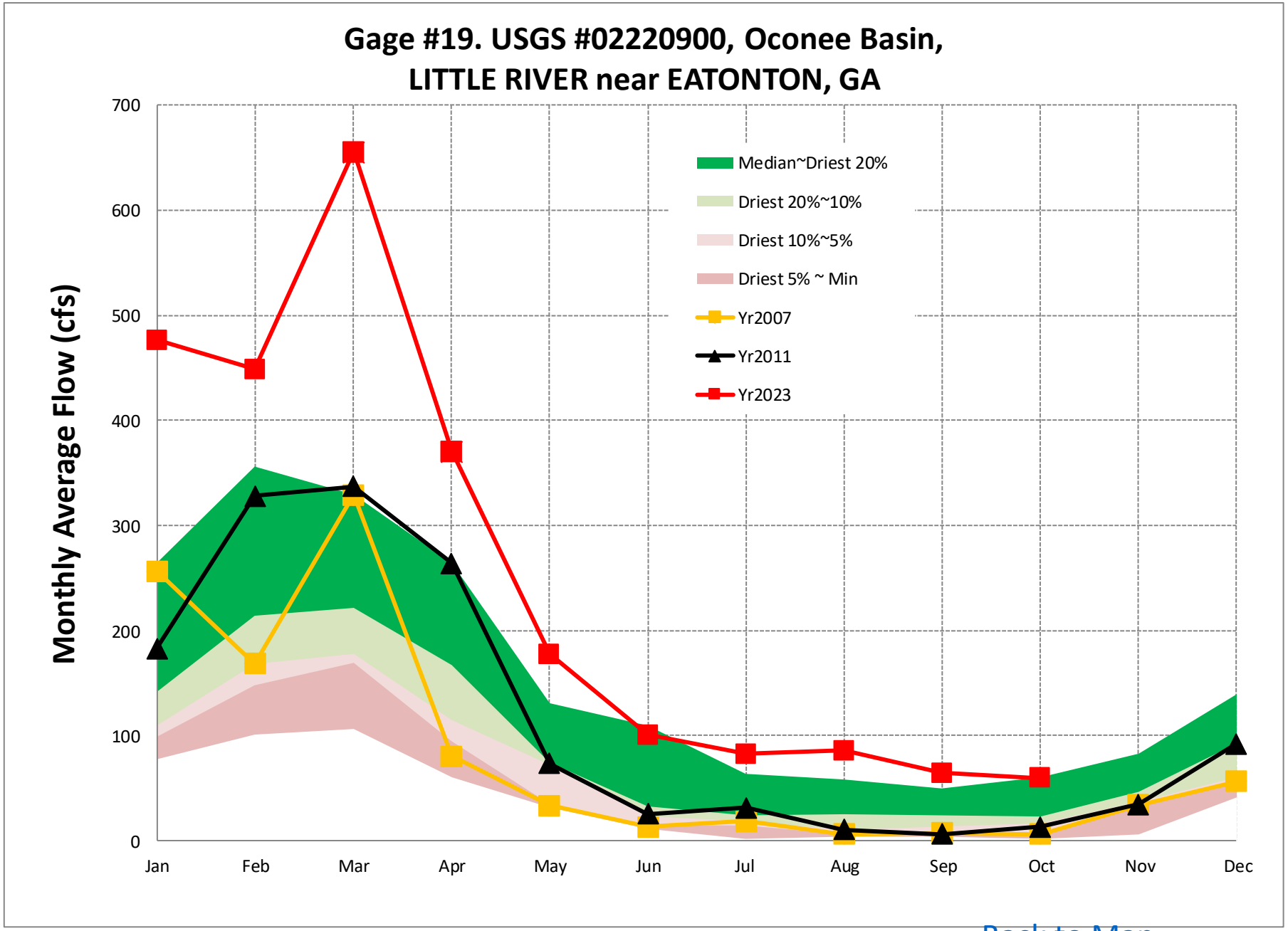
Gage #19. USGS #02220900, Oconee Basin,
LITTLE RIVER near EATONTON, GA
Monthly Average Flow (cfs)
700
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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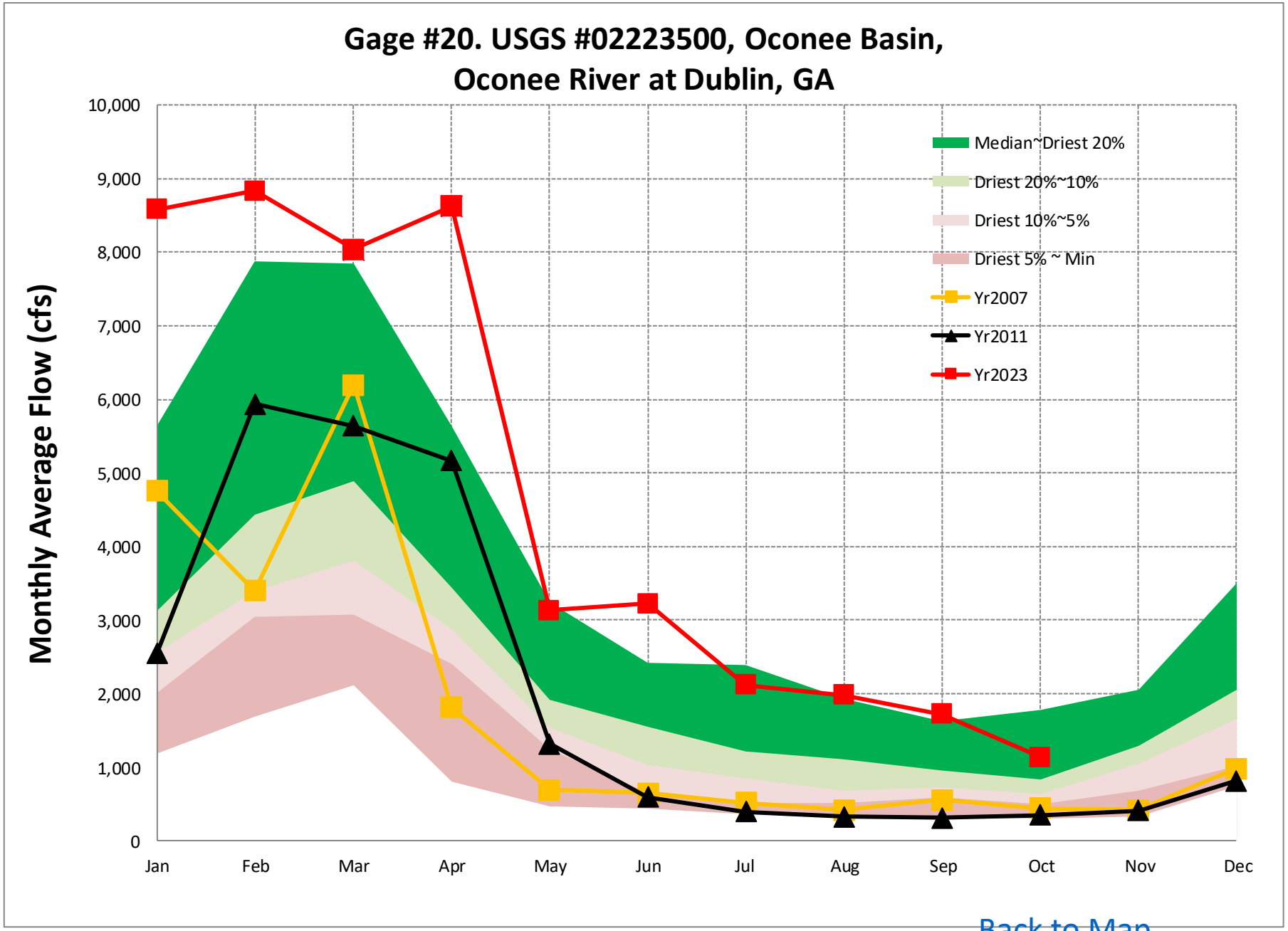
Gage #20. USGS #02223500, Oconee Basin,
Oconee River at Dublin, GA
Monthly Average Flow (cfs)
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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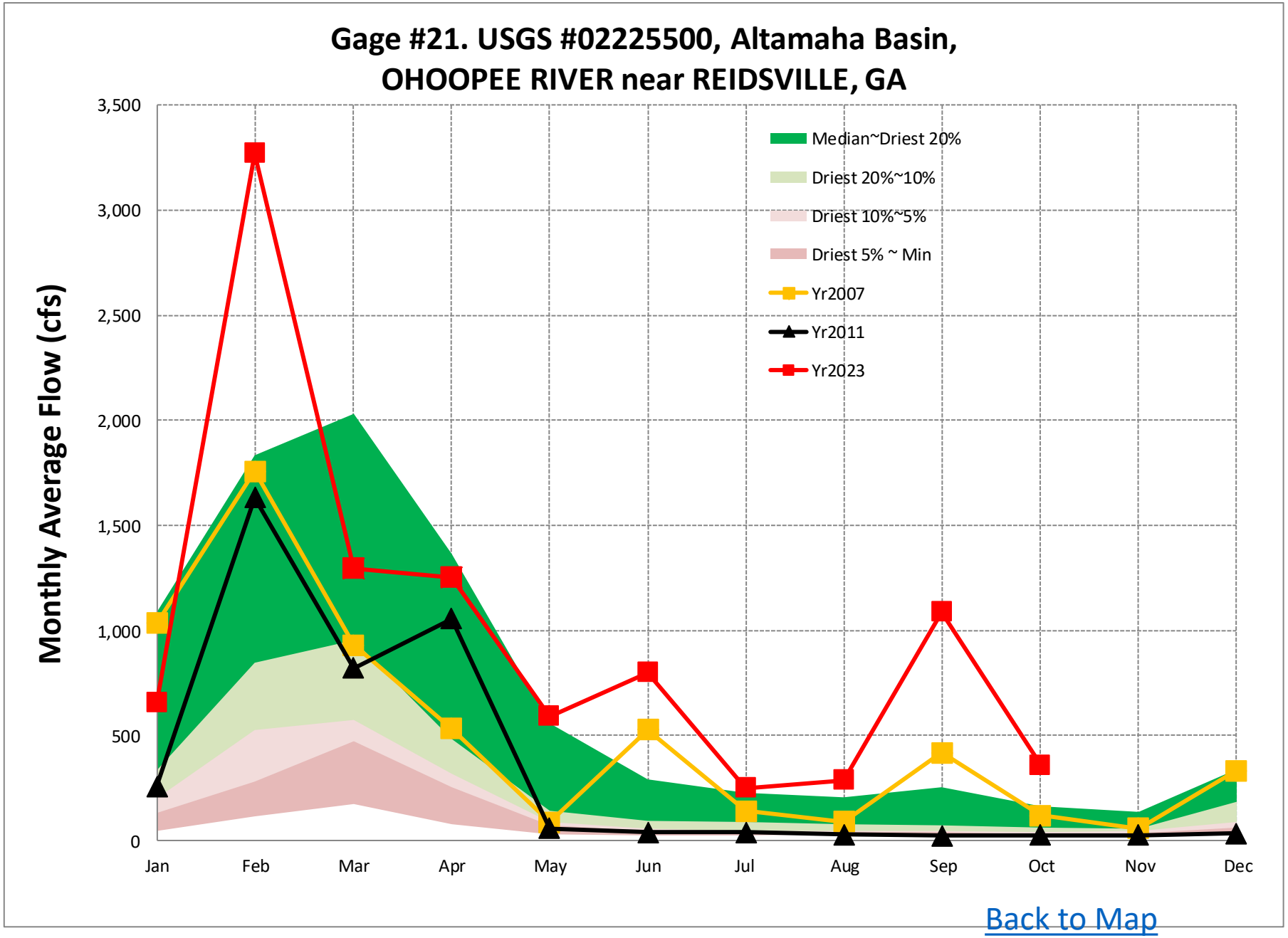
Gage #21. USGS #02225500, Altamaha Basin,
OHOOPEE RIVER near REIDSVILLE, GA
Monthly Average Flow (cfs)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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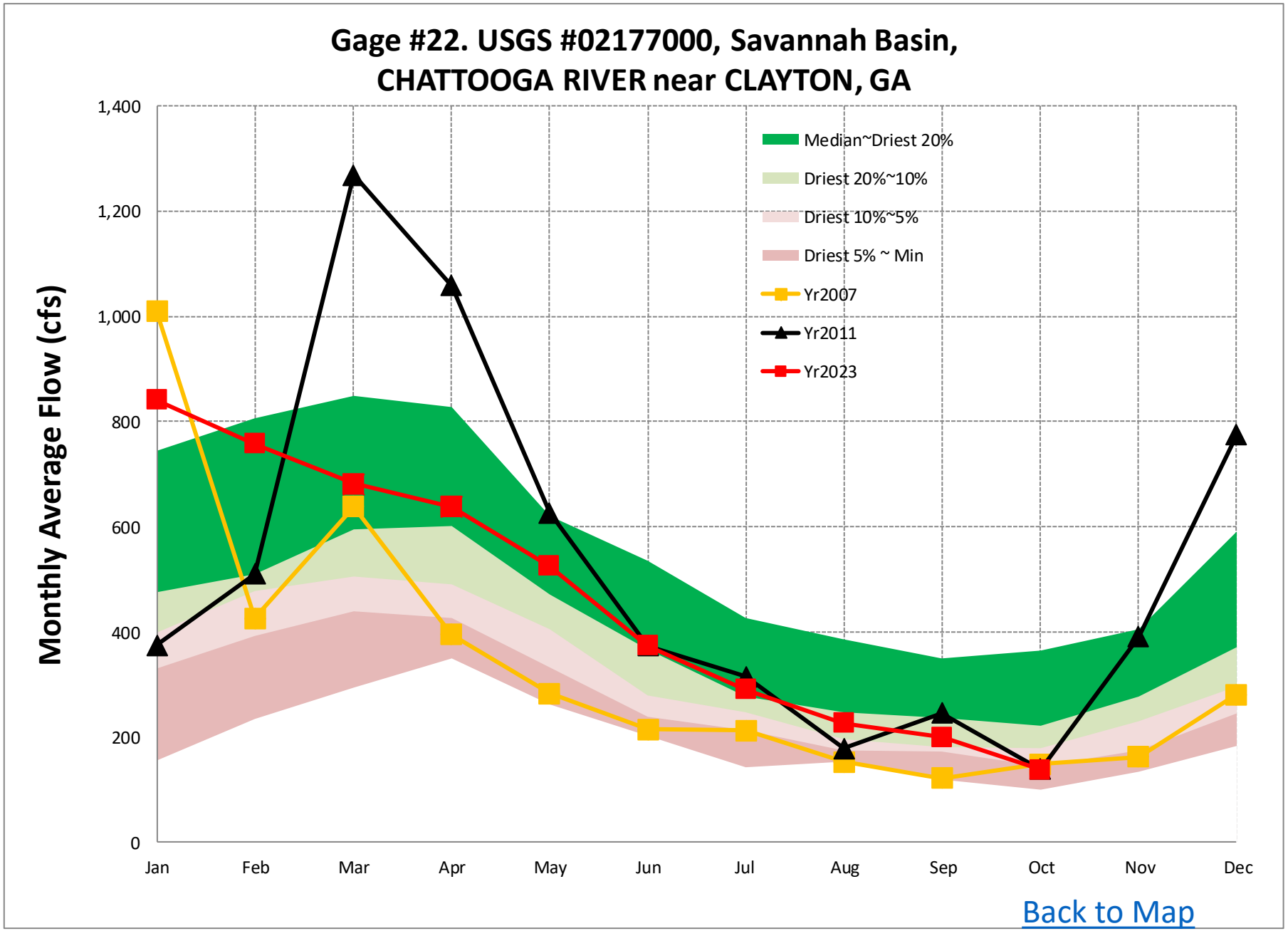
Gage #22. USGS #02177000, Savannah Basin,
CHATTOOGA RIVER near CLAYTON, GA
Monthly Average Flow (cfs)
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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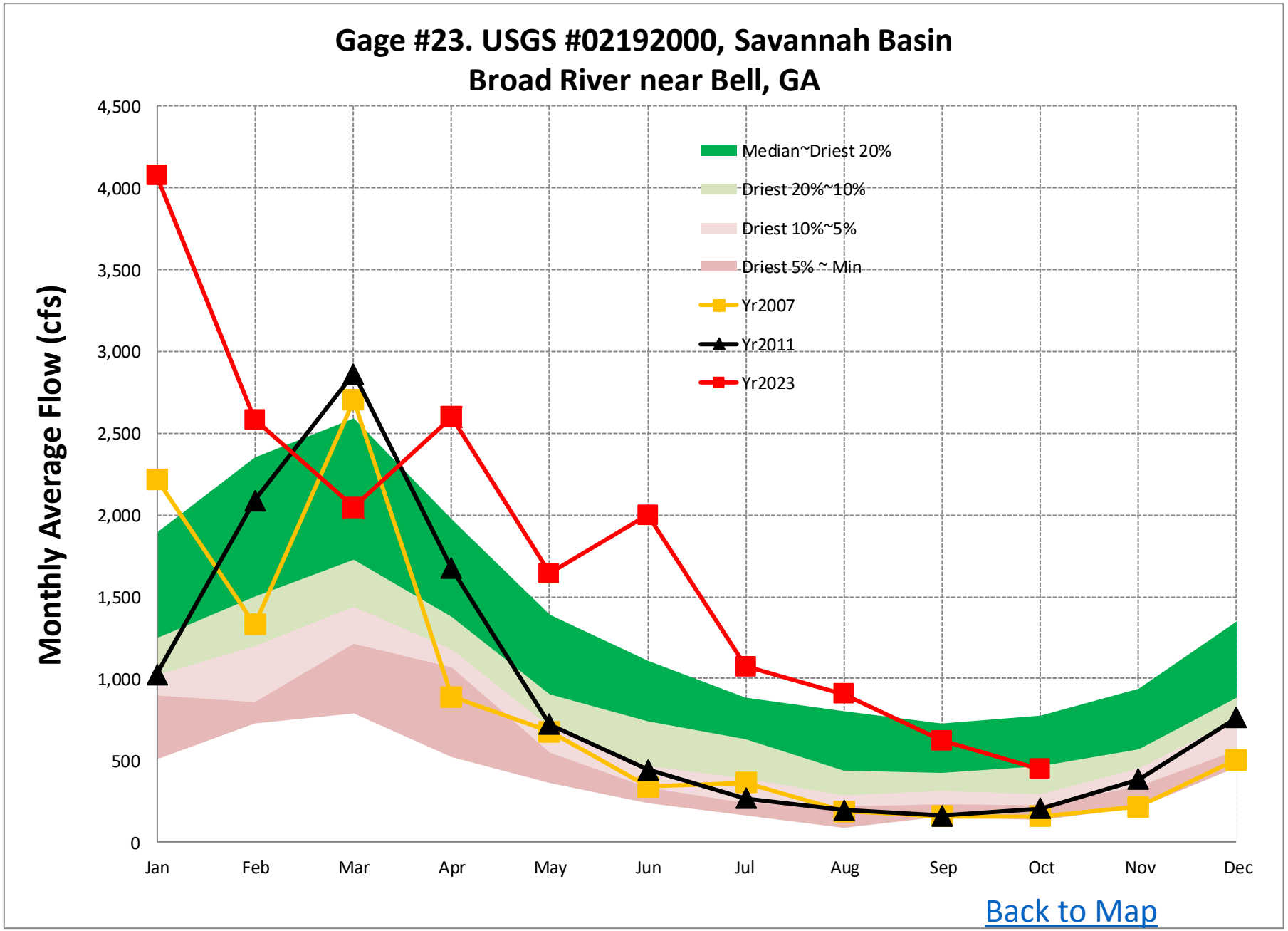
Gage #23. USGS #02192000, Savannah Basin
Broad River near Bell, GA
Monthly Average Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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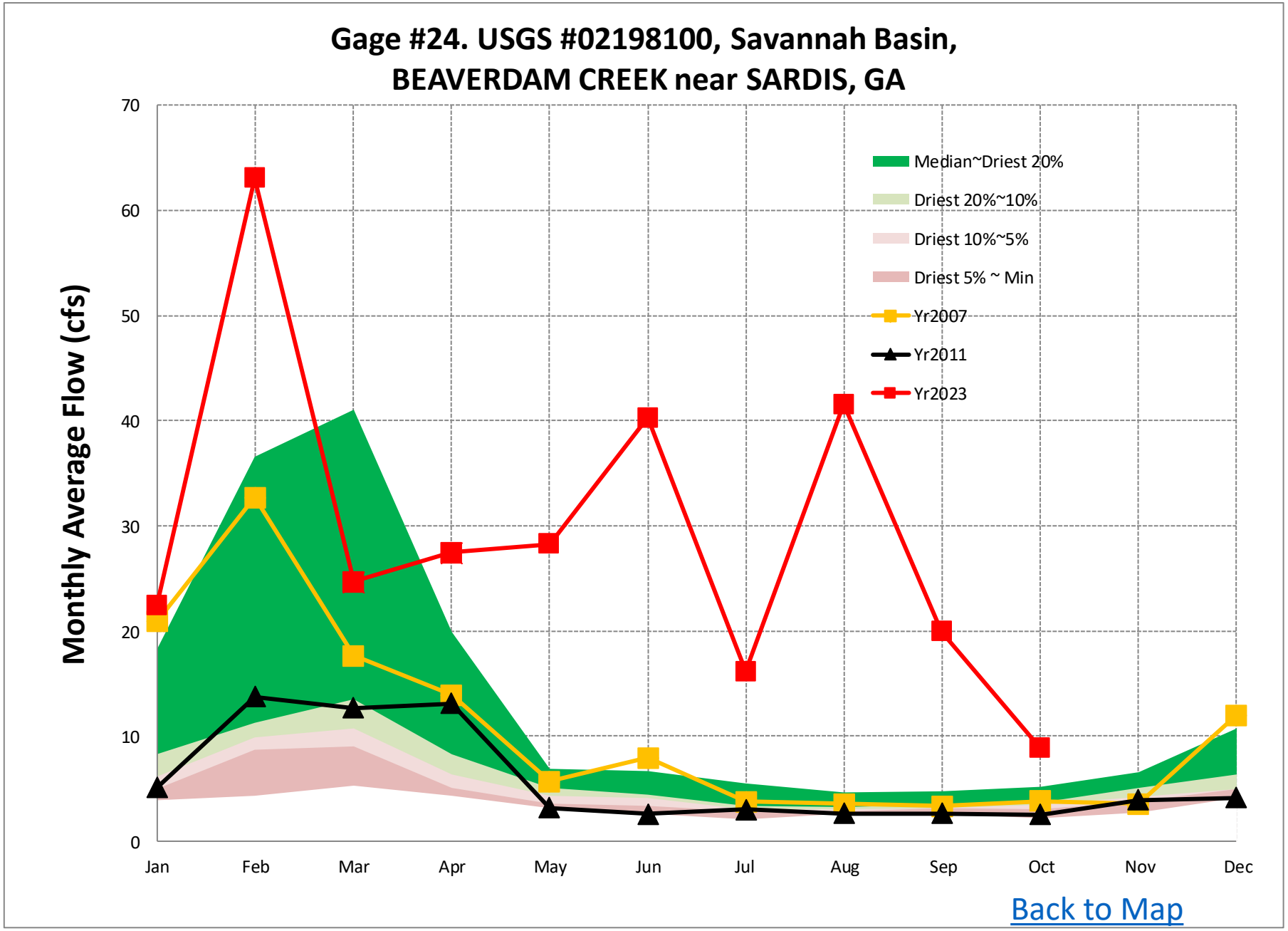
Gage #24. USGS #02198100, Savannah Basin,
BEAVERDAM CREEK near SARDIS, GA
Monthly Average Flow (cfs)
70
60
50
40
30
20
10
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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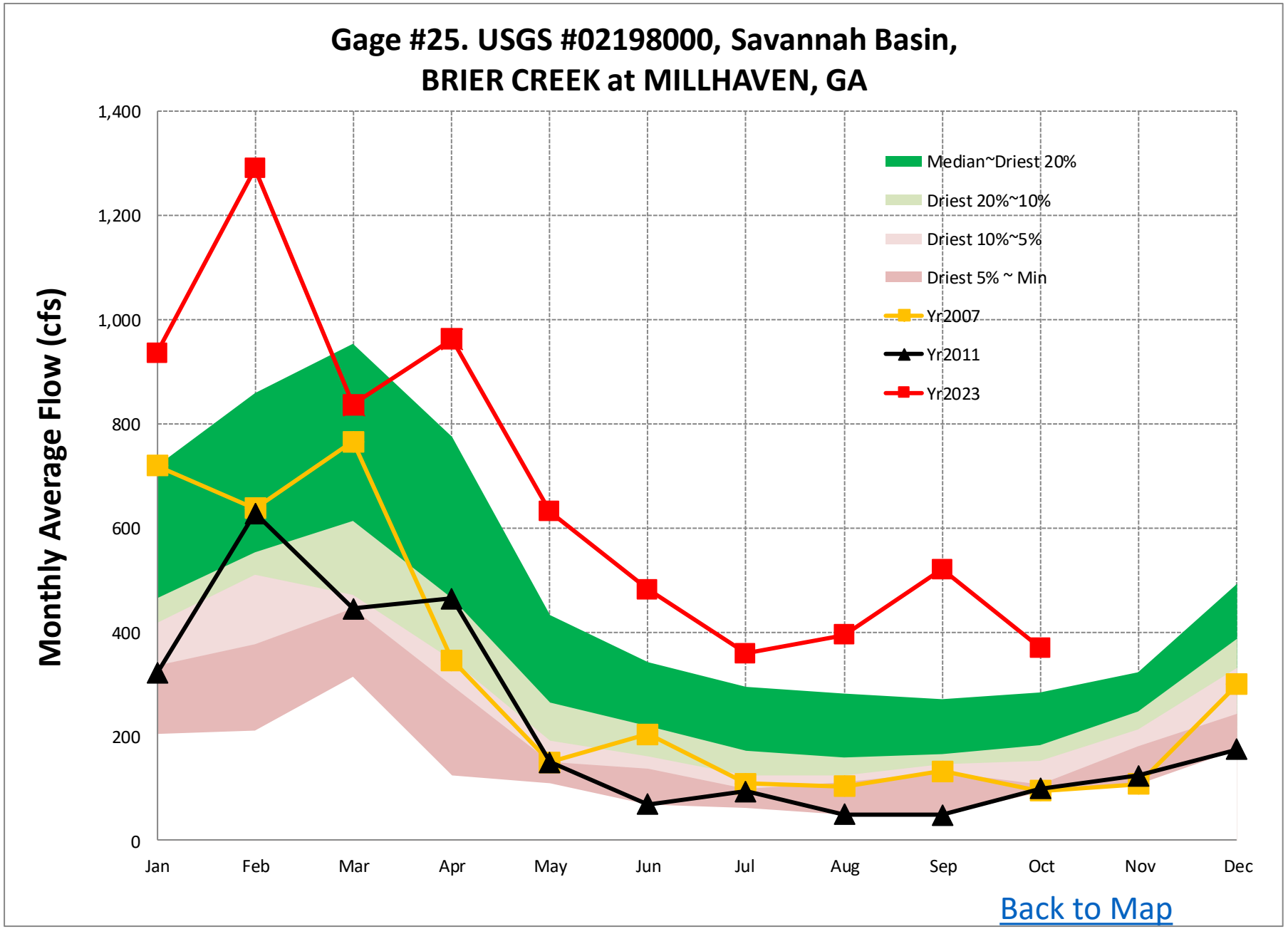
Gage #25. USGS #02198000, Savannah Basin,
BRIER CREEK at MILLHAVEN, GA
Monthly Average Flow (cfs)
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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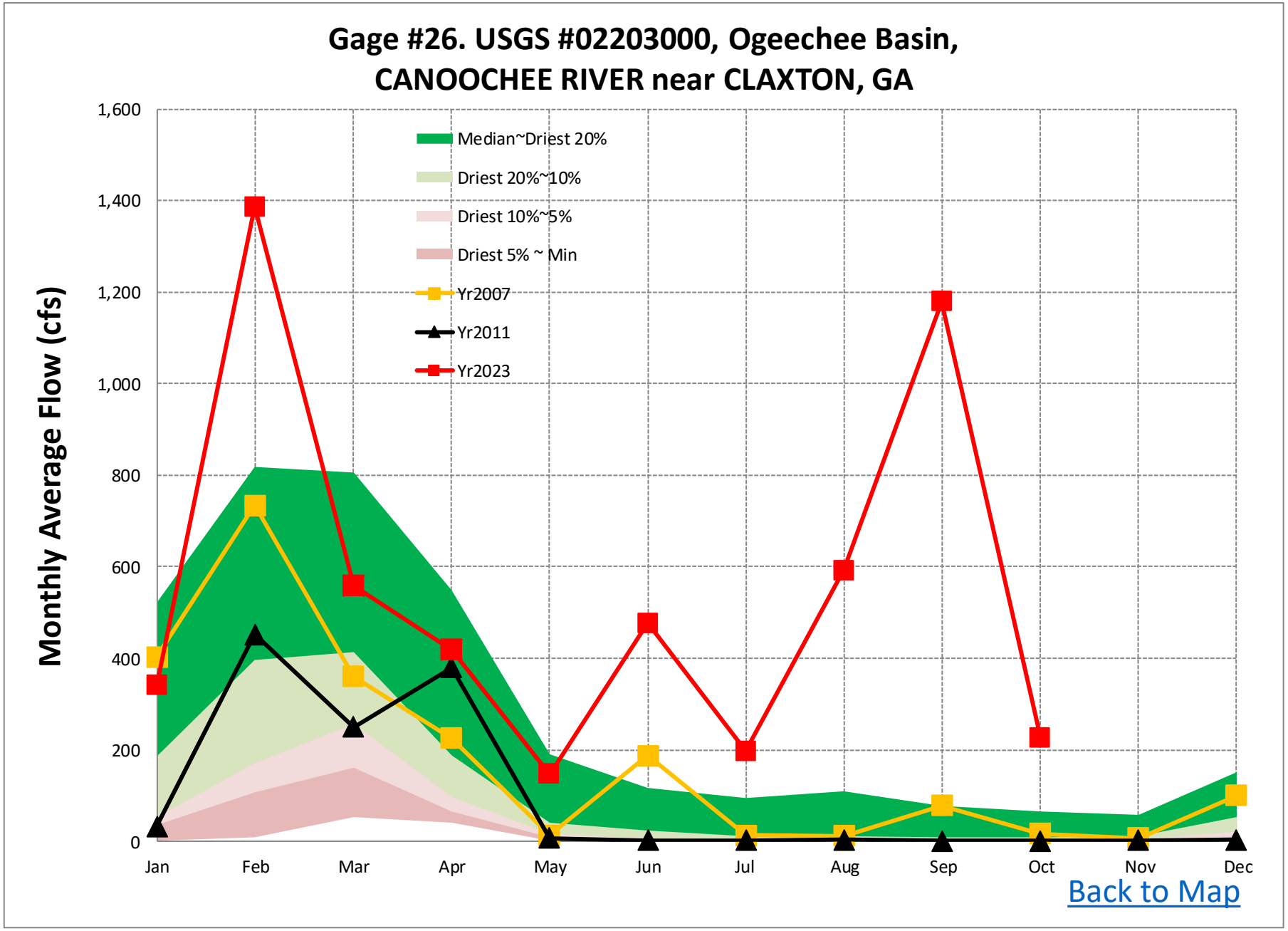
Gage #26. USGS #02203000, Ogeechee Basin,
CANOOCHEE RIVER near CLAXTON, GA
Monthly Average Flow (cfs)
1,600
1,400
1,200
1,000
800
600
400
200
0
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

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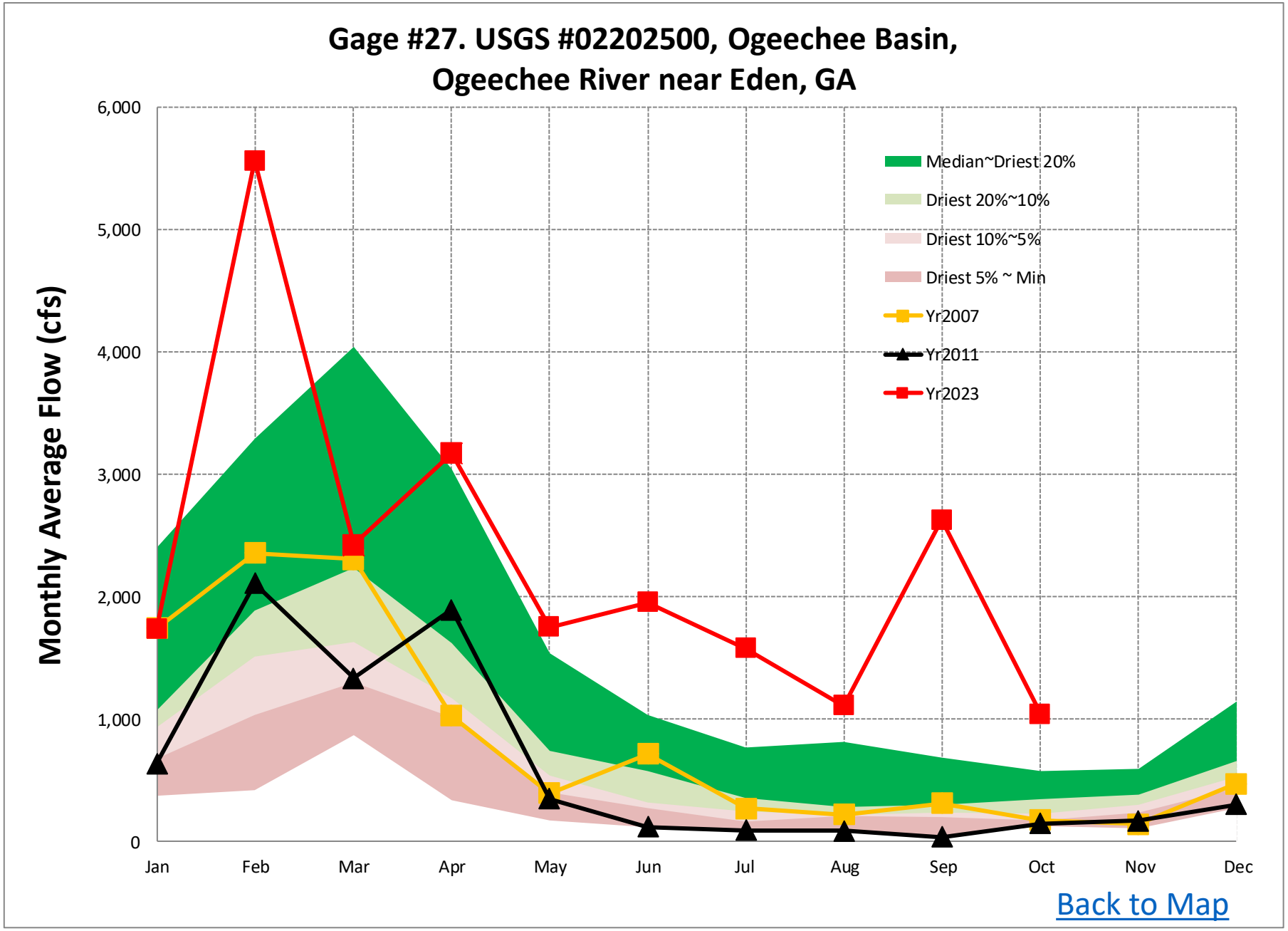
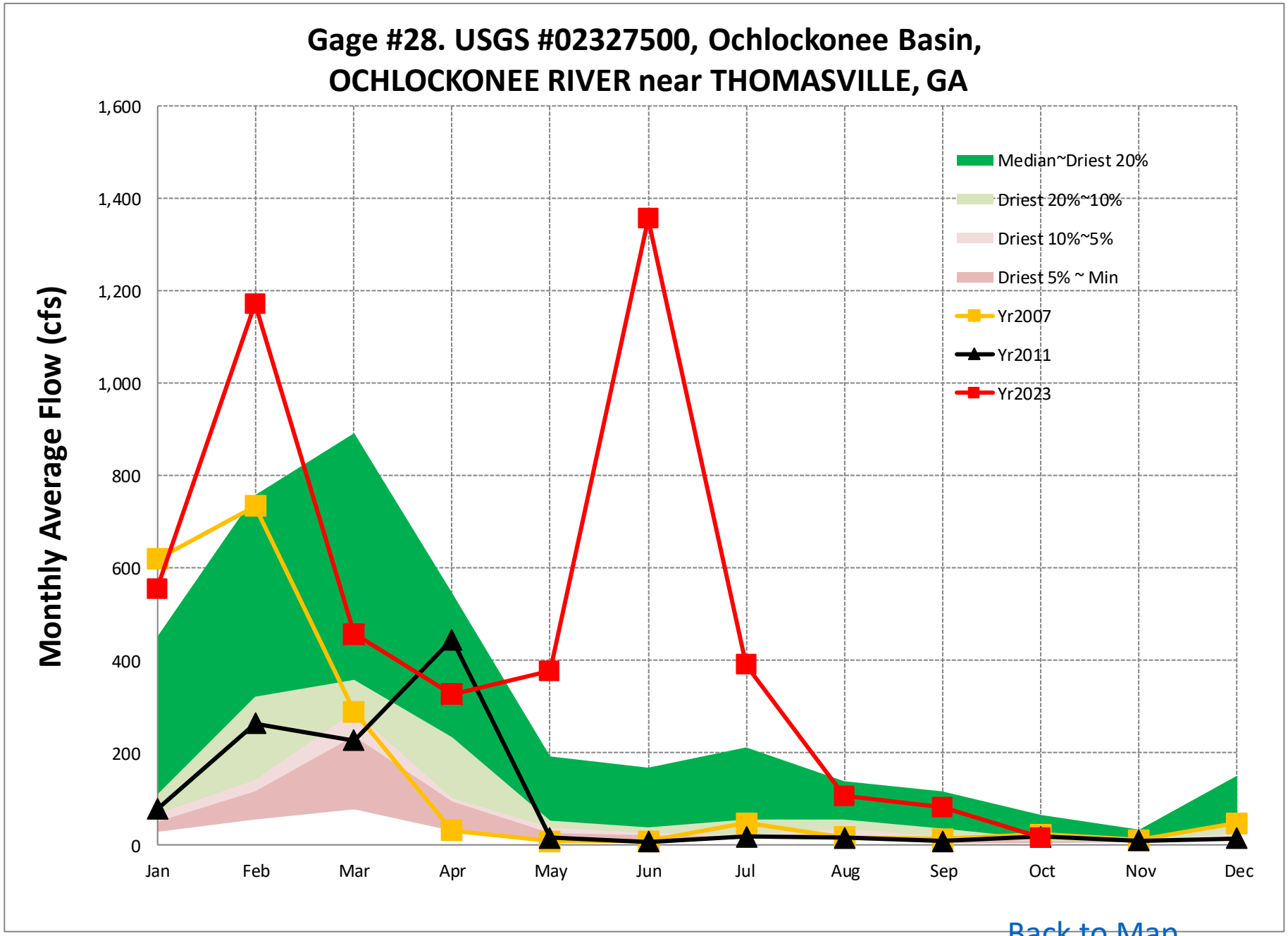

Gage #27. USGS #02202500, Ogeechee Basin,
Ogeechee River near Eden, GA
Monthly Average Flow (cfs)
6,000
5,000
4,000
3,000
2,000
1,000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023
Back to Map


Gage #28. USGS #02327500, Ochlockonee Basin,
OCHLOCKONEE RIVER near THOMASVILLE, GA
Monthly Average Flow (cfs)
1,600
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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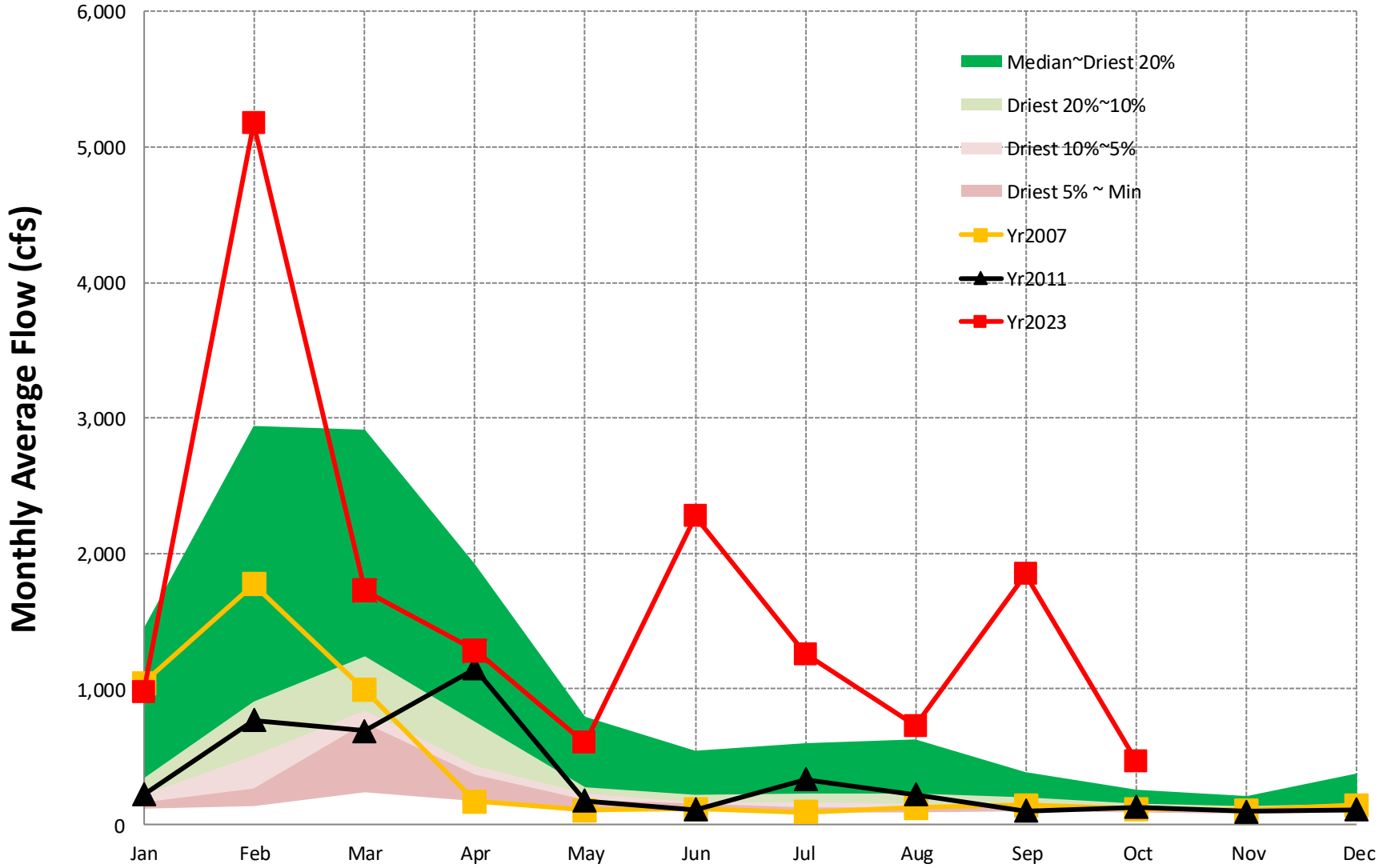
Gage #29. USGS #02319000, Suwanee Basin, WITHLACOOCHEE RIVER near PINETTA, FL



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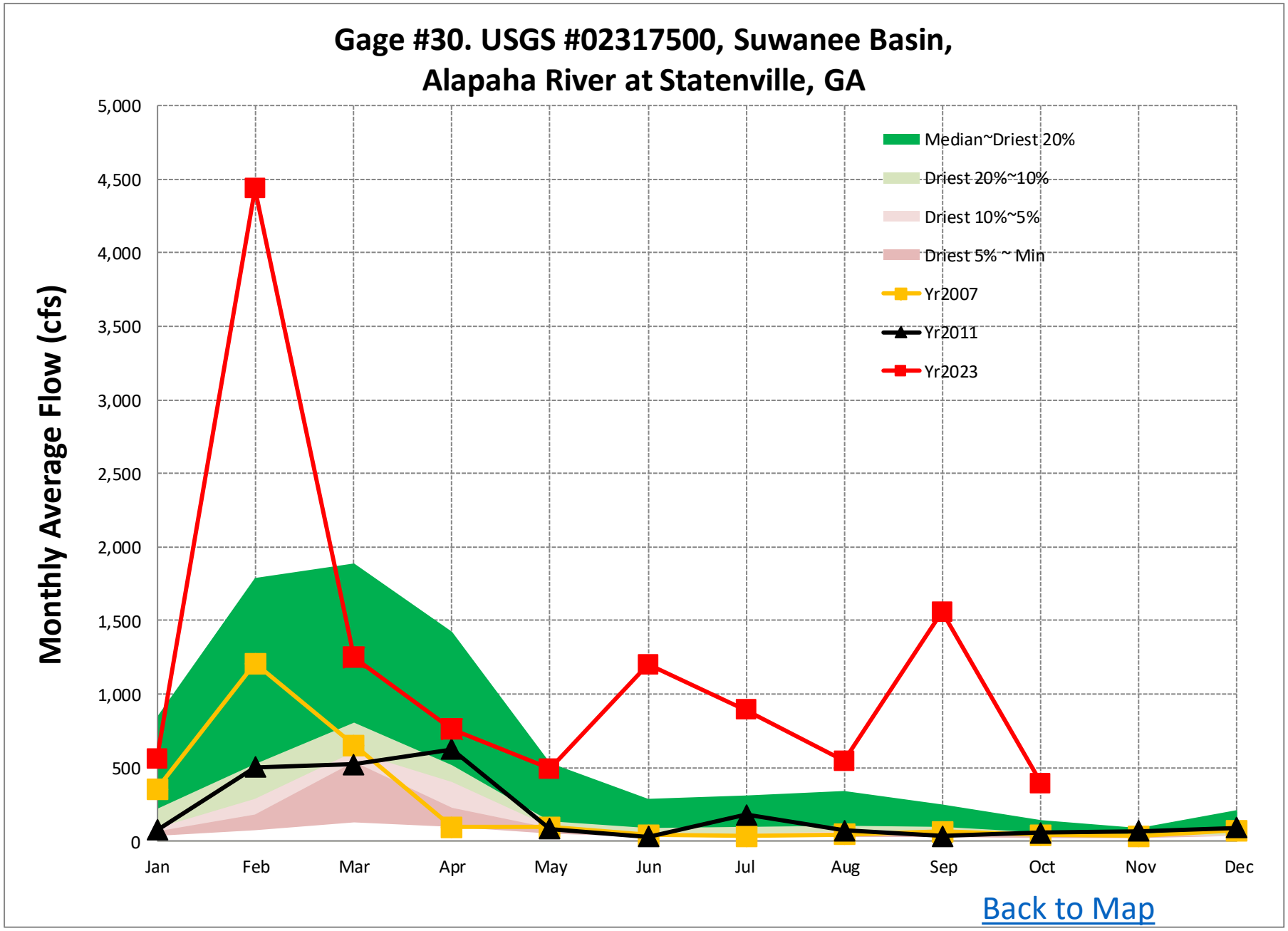
Gage #30. USGS #02317500, Suwanee Basin,
Alapaha River at Statenville, GA
Monthly Average Flow (cfs)
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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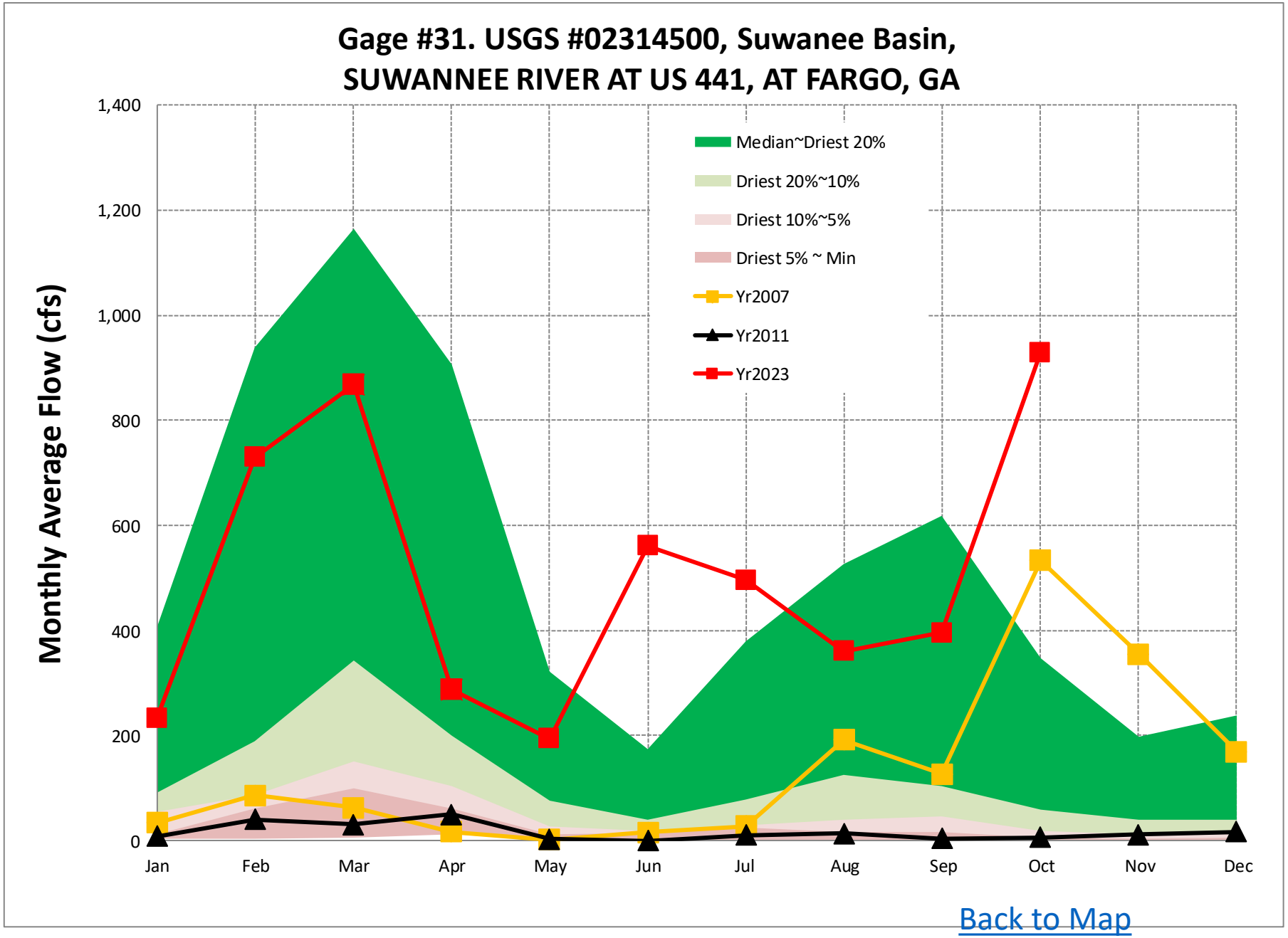
Gage #31. USGS #02314500, Suwanee Basin,
SUWANNEE RIVER AT US 441, AT FARGO, GA
Monthly Average Flow (cfs)
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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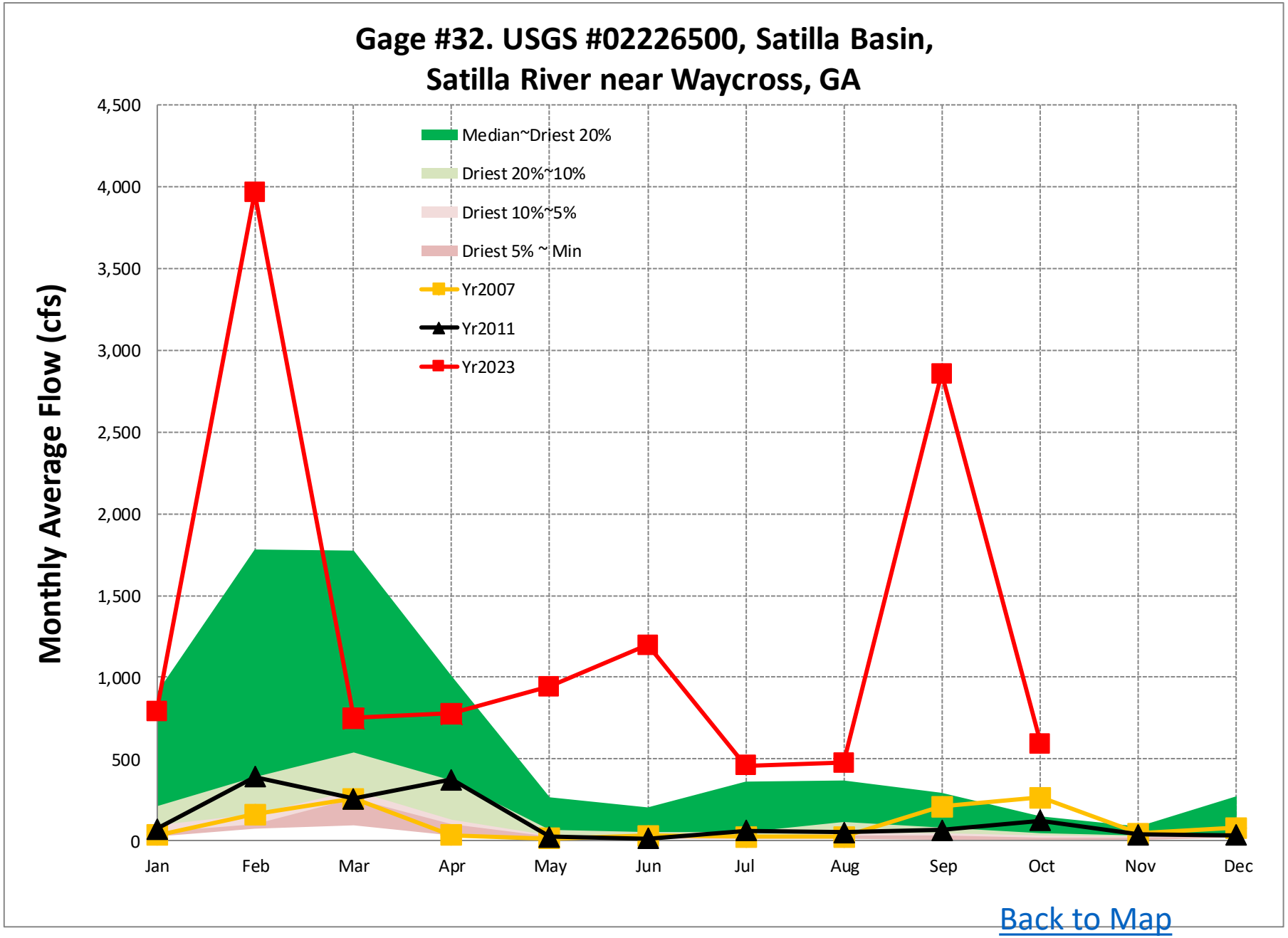
Gage #32. USGS #02226500, Satilla Basin,
Satilla River near Waycross, GA
Monthly Average Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

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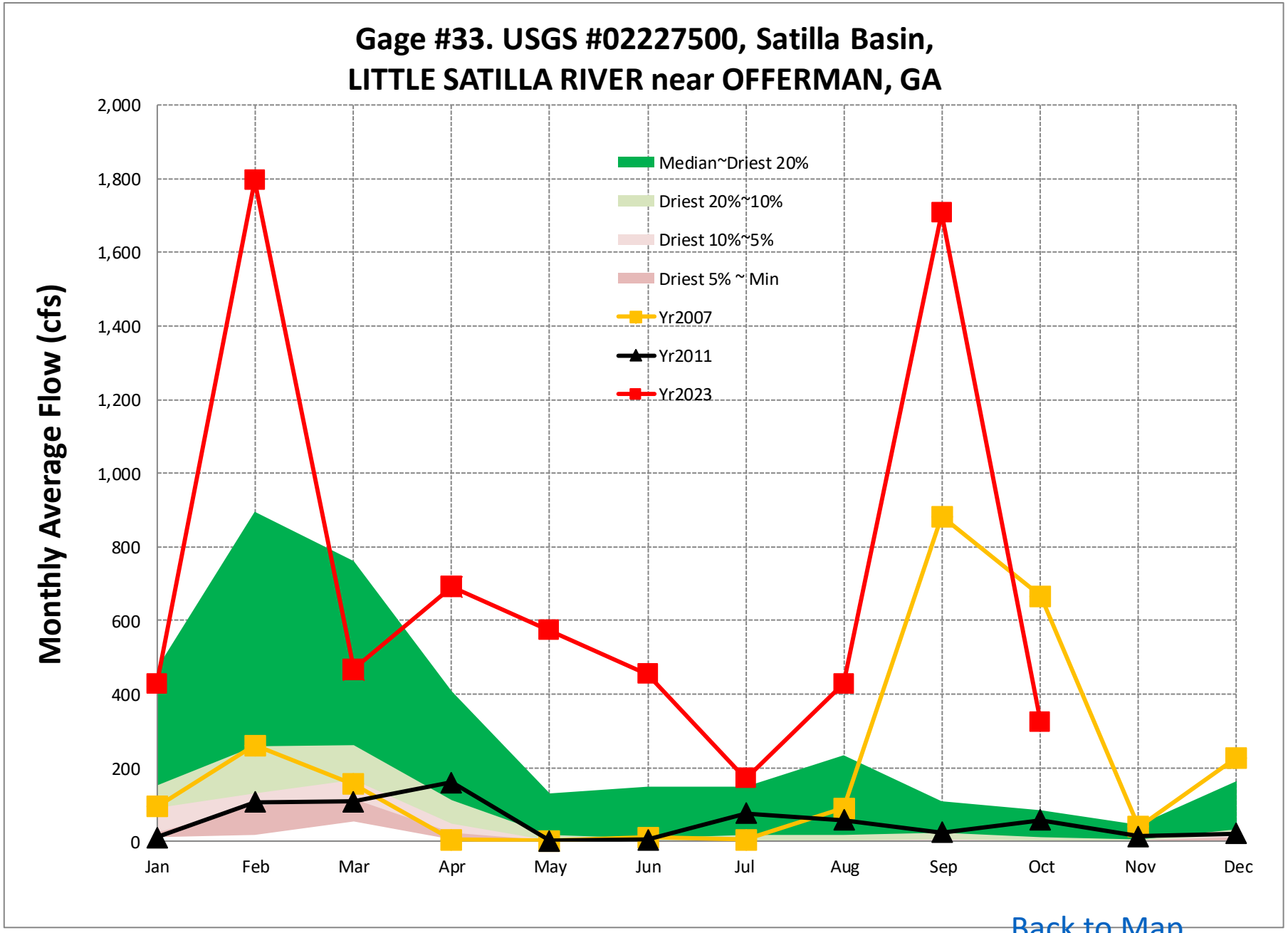
Gage #33. USGS #02227500, Satilla Basin,
LITTLE SATILLA RIVER near OFFERMAN, GA
Monthly Average Flow (cfs)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023

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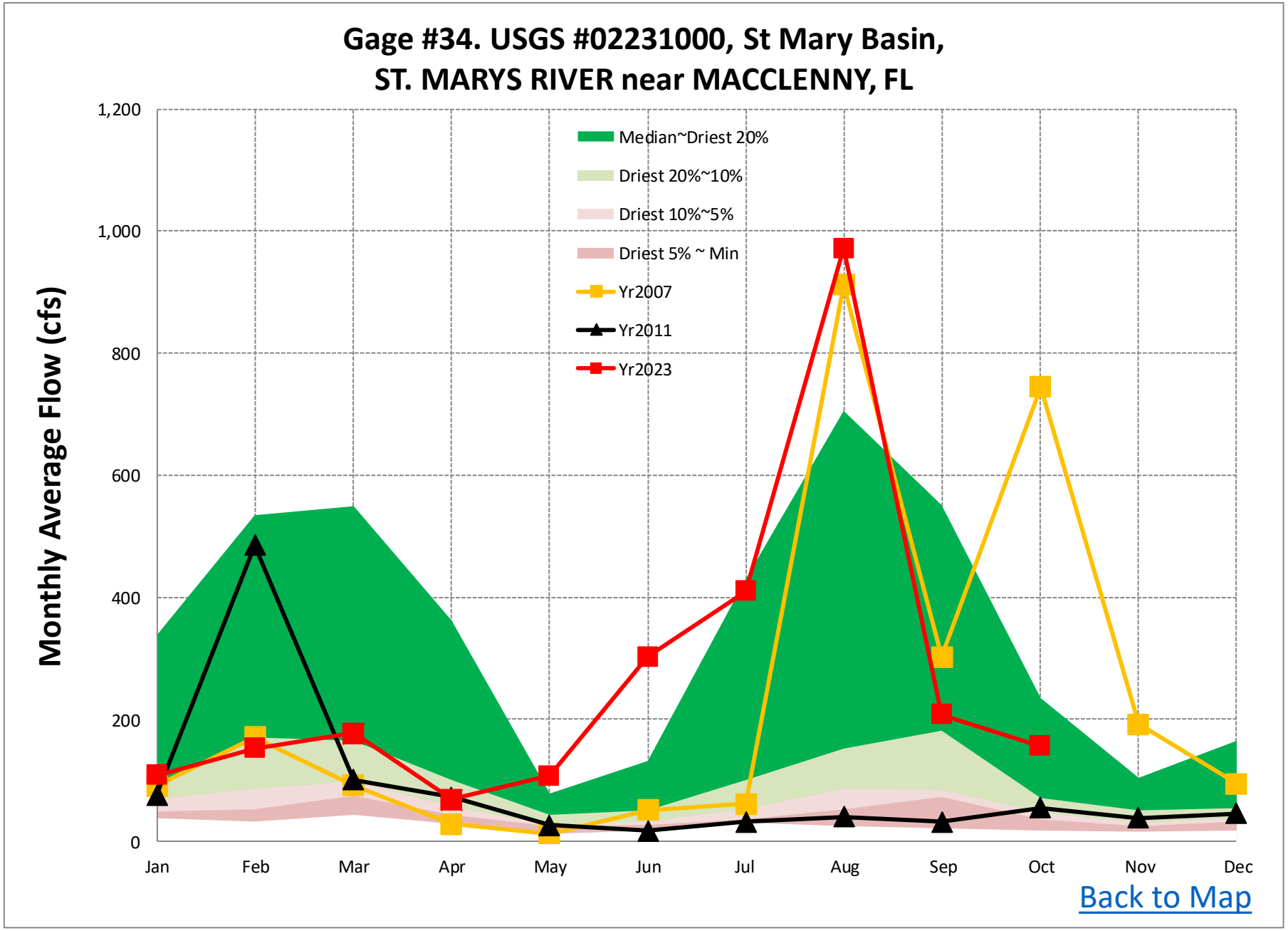
Gage #34. USGS #02231000, St Mary Basin,
ST. MARYS RIVER near MACCLENNY, FL
Monthly Average Flow (cfs)
1,200
1,000
800
600
400
200
0
Median~Driest 20%
Driest 20%~10%
Driest 10%~5%
Driest 5% ~ Min
Yr2007
Yr2011
Yr2023
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

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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

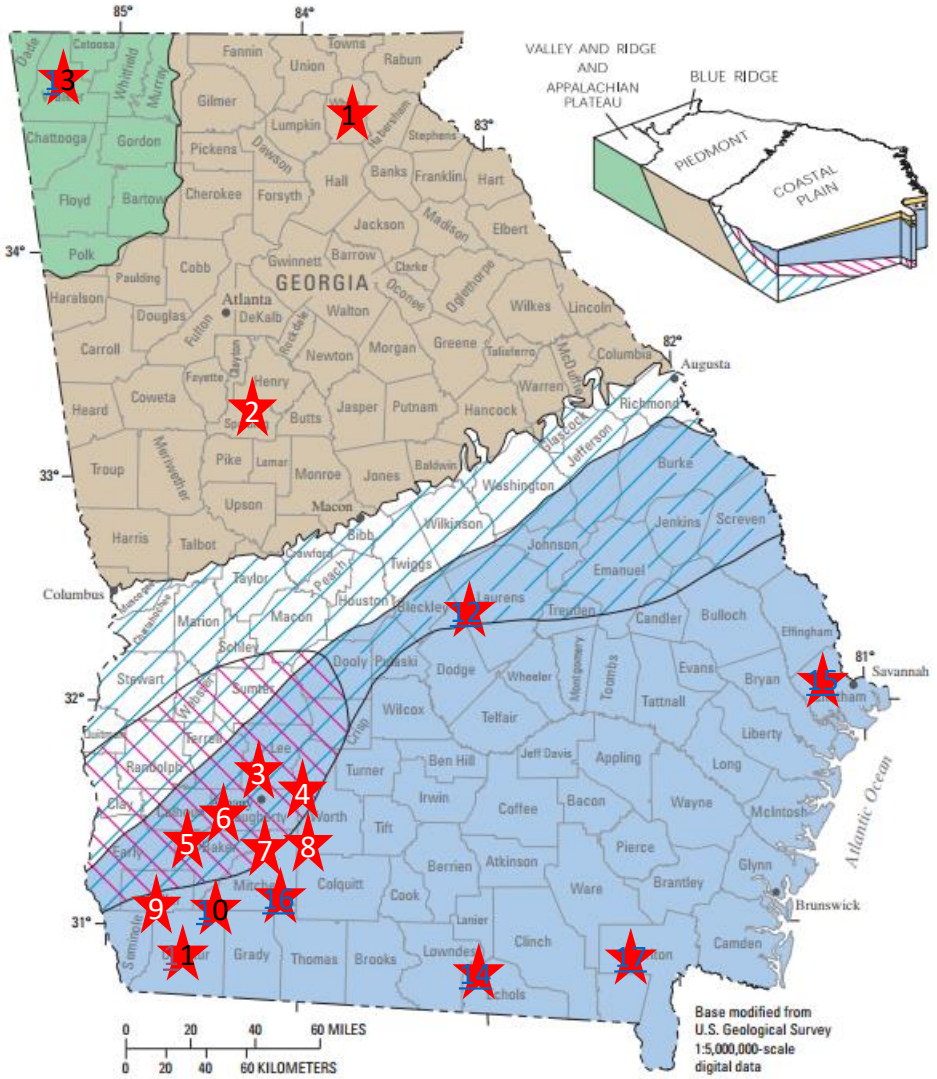


Figure 2. Area of use of principal aquifers and physiographic provinces in Georgia (modified from U.S. Geological Survey, 2006).

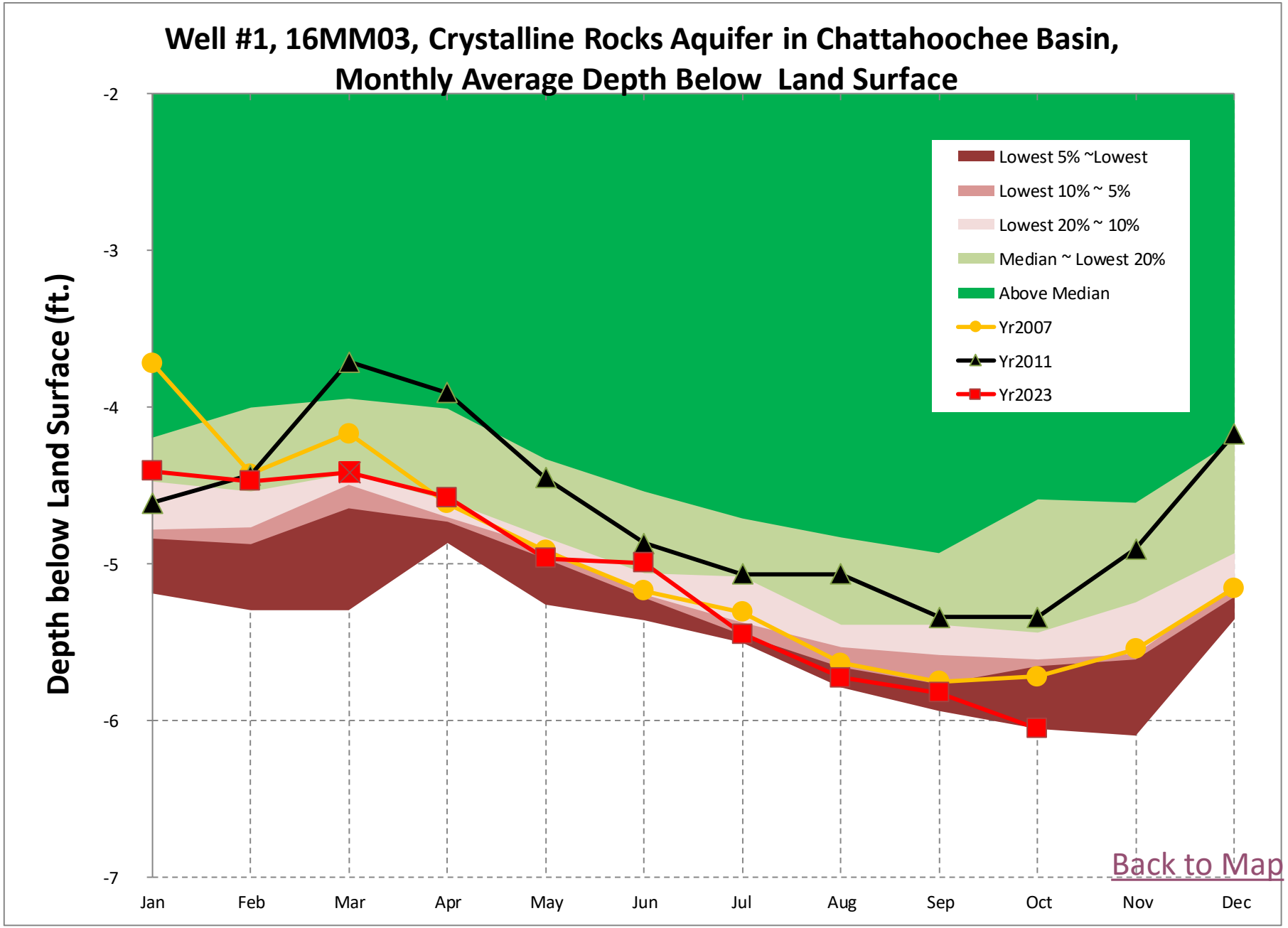
Groundwater Level Graphs

- For each of the 17 groundwater wells, EPD has prepared a graph that shows monthly average groundwater levels from January 2023 through October 2023;
- 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 October 2023 was 50 ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in October have historically been lower than October 2023 about 16% of the time; about 84% of the time in October they have been higher.
- The average monthly groundwater level in October 2011 was 50.9 ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in October have historically been lower than October 2011 about 2% of the time; about 98% of the time in October they have been higher.
- The average monthly groundwater level in October 2007 was 51 ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in October have historically been lower than October 2007 about 0.1% of the time; about 99.9% of the time in October they have been higher.


Well #1, 16MM03, Crystalline Rocks Aquifer in Chattahoochee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-2
-3
-4
-5
-6
-7
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

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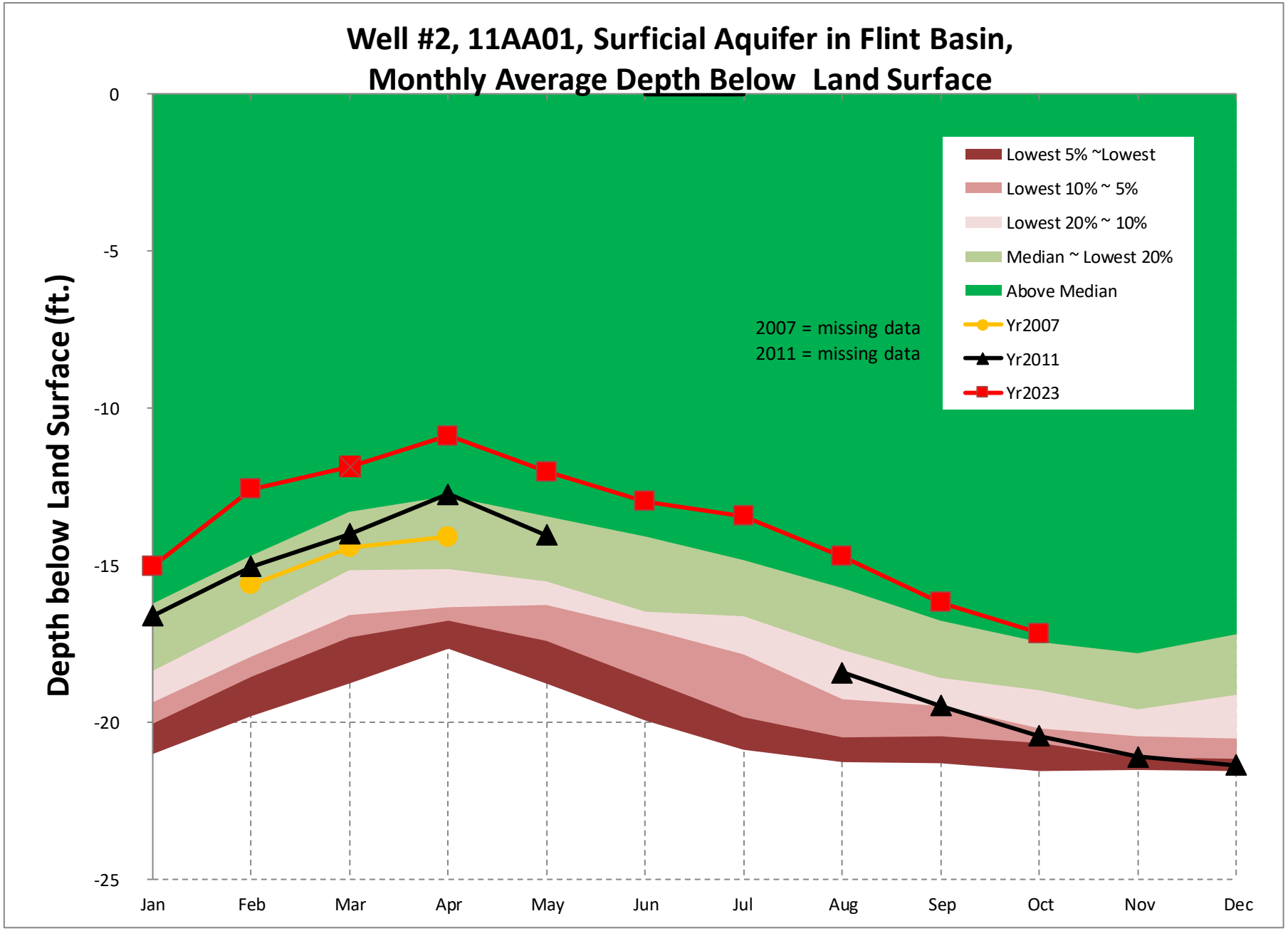
Well #2, 11AA01, Surficial Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
0
-5
-10
-15
-20
-25
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2007 = missing data
2011 = missing data
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

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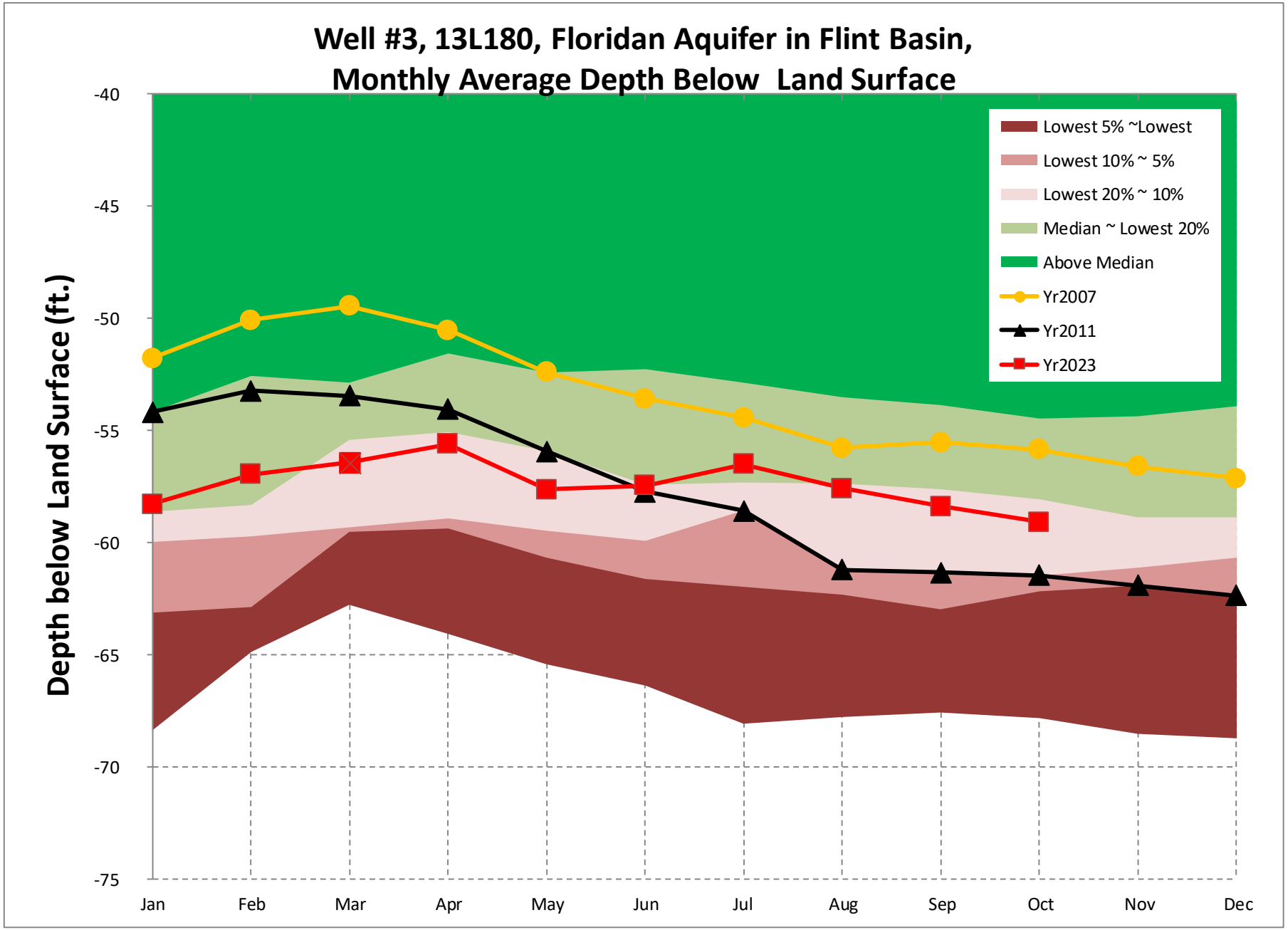
Well #3, 13L180, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-40
-45
-50
-55
-60
-65
-70
-75
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

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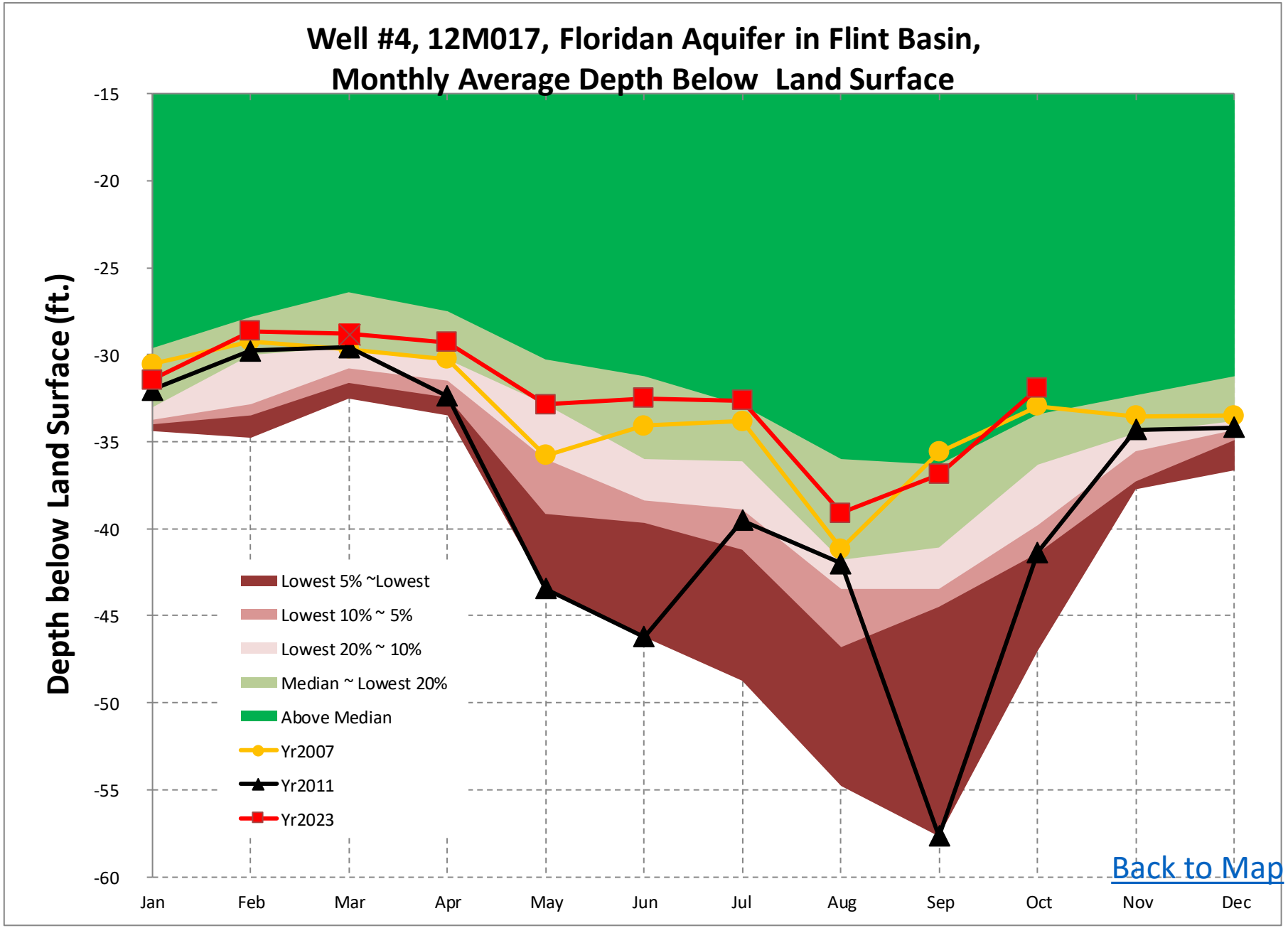
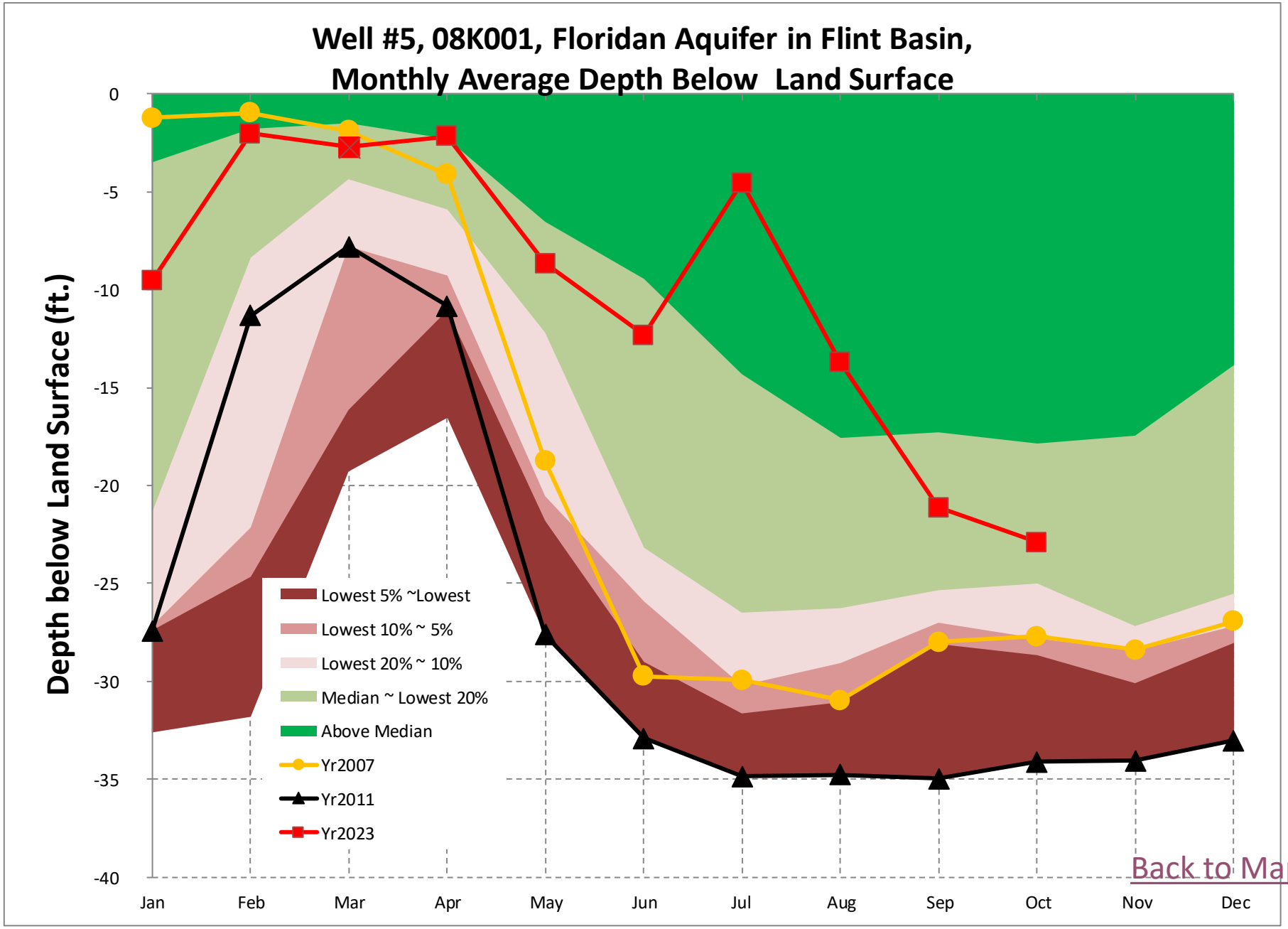
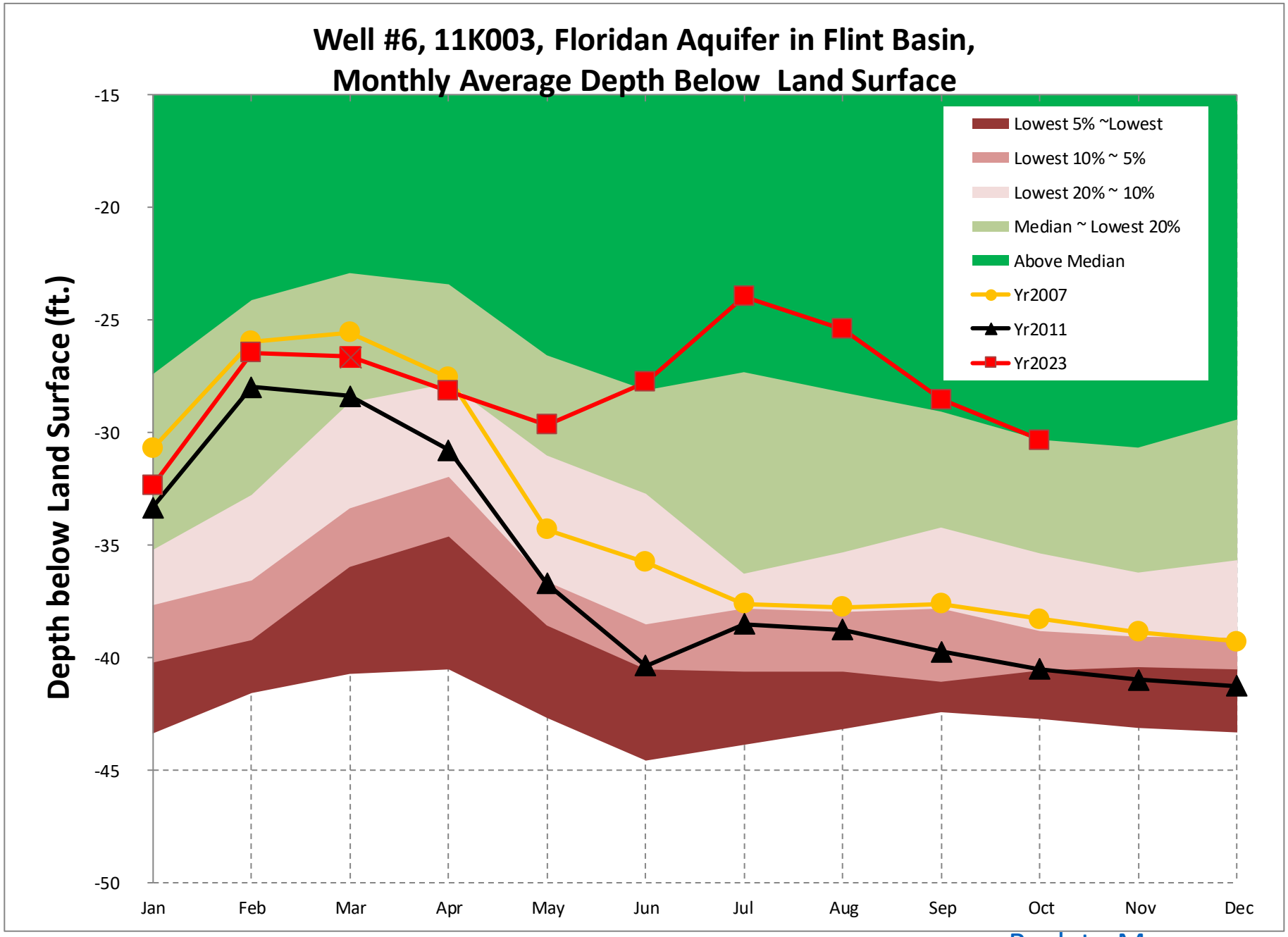

Well #4, 12M017, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-15
-20
-25
-30
-35
-40
-45
-50
-55
-60
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

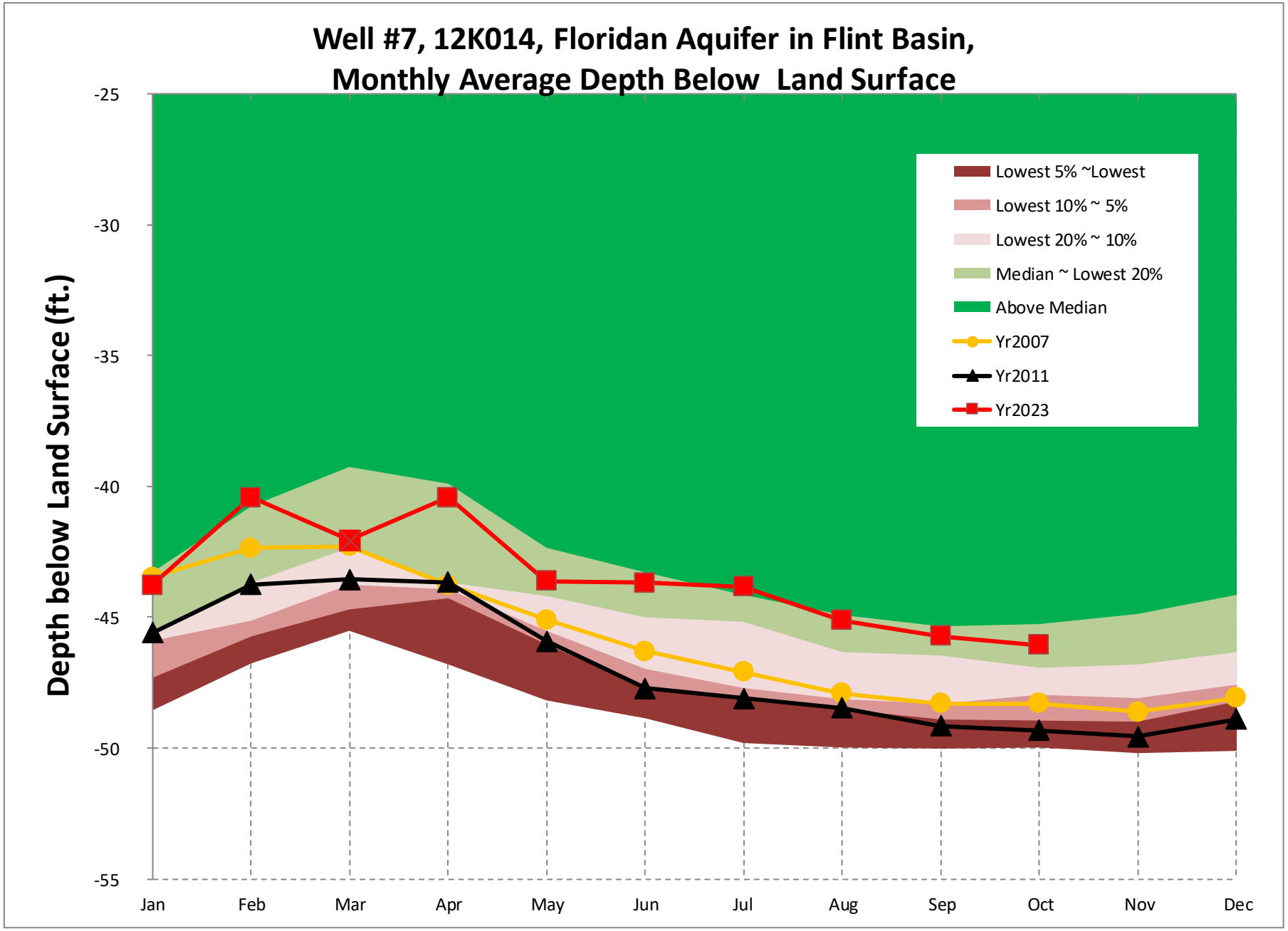
Back to Map


Well #5, 08K001, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
0
-5
-10
-15
-20
-25
-30
-35
-40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

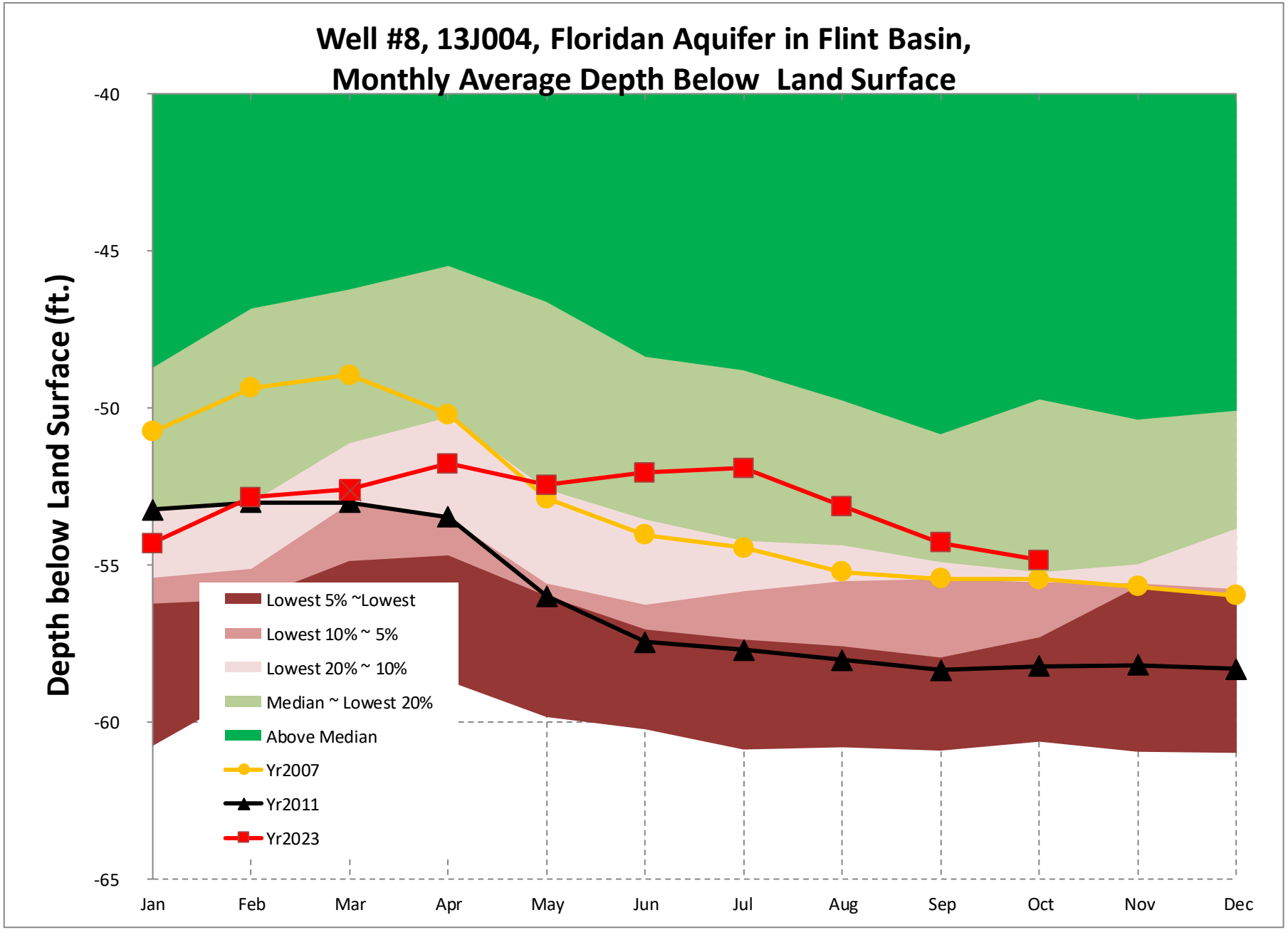
Back to Map


Well #6, 11K003, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-15
-20
-25
-30
-35
-40
-45
-50
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

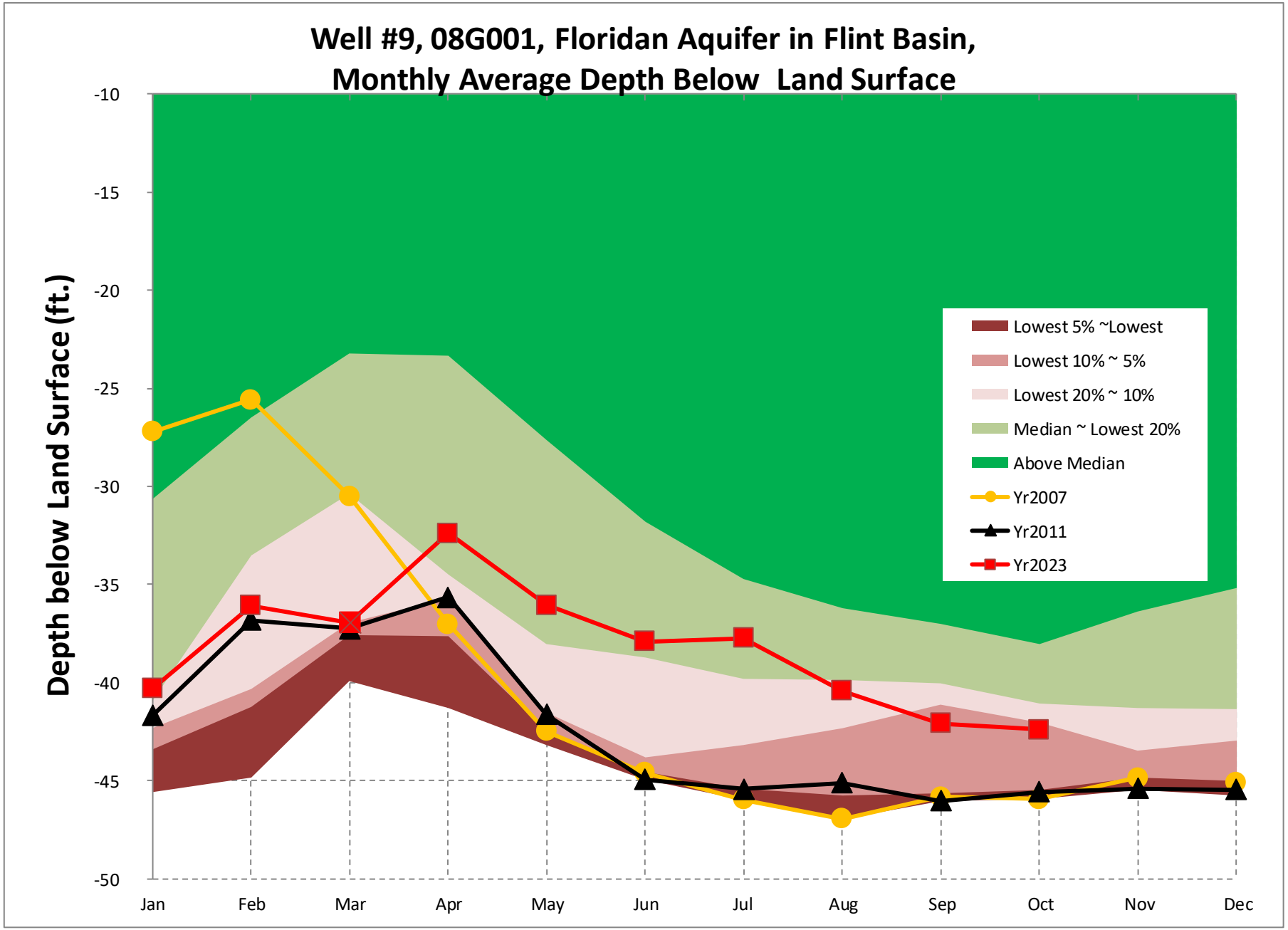
Back to Map


Well #7, 12K014, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-25
-30
-35
-40
-45
-50
-55
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

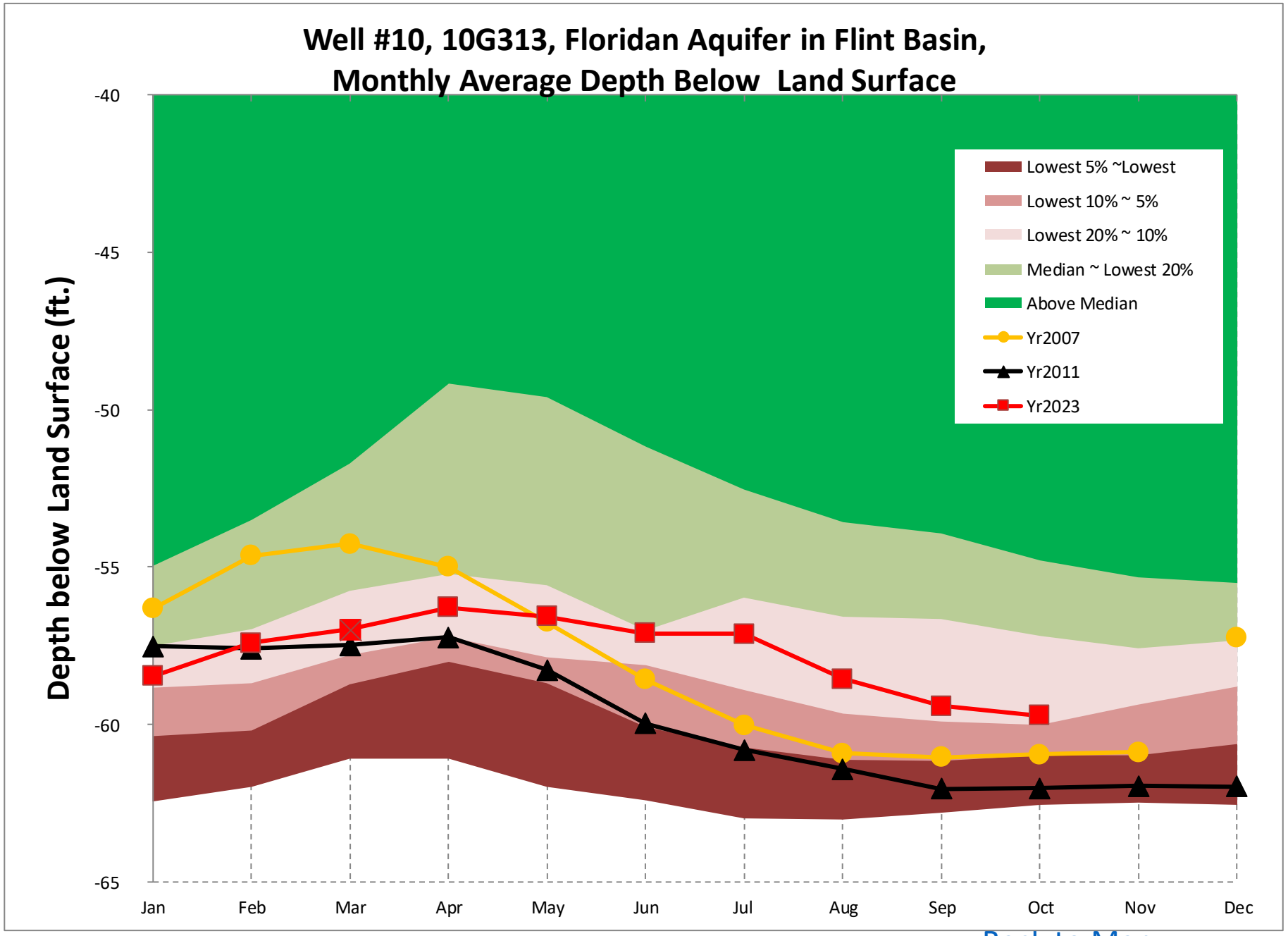
Back to Map


Well #8, 13J004, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-40
-45
-50
-55
-60
-65
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

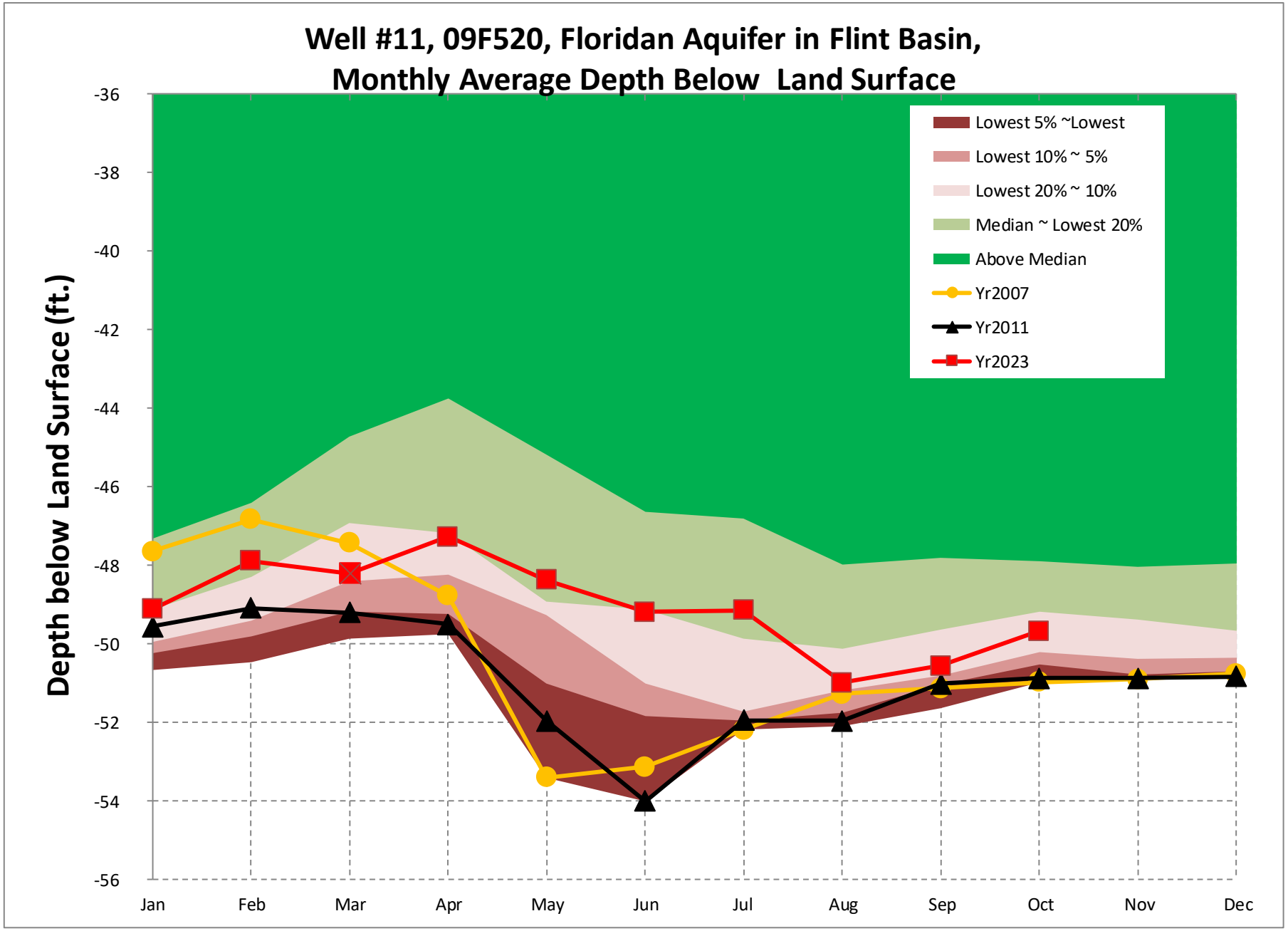
Back to Map


Well #9, 08G001, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-10
-15
-20
-25
-30
-35
-40
-45
-50
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

Back to Map

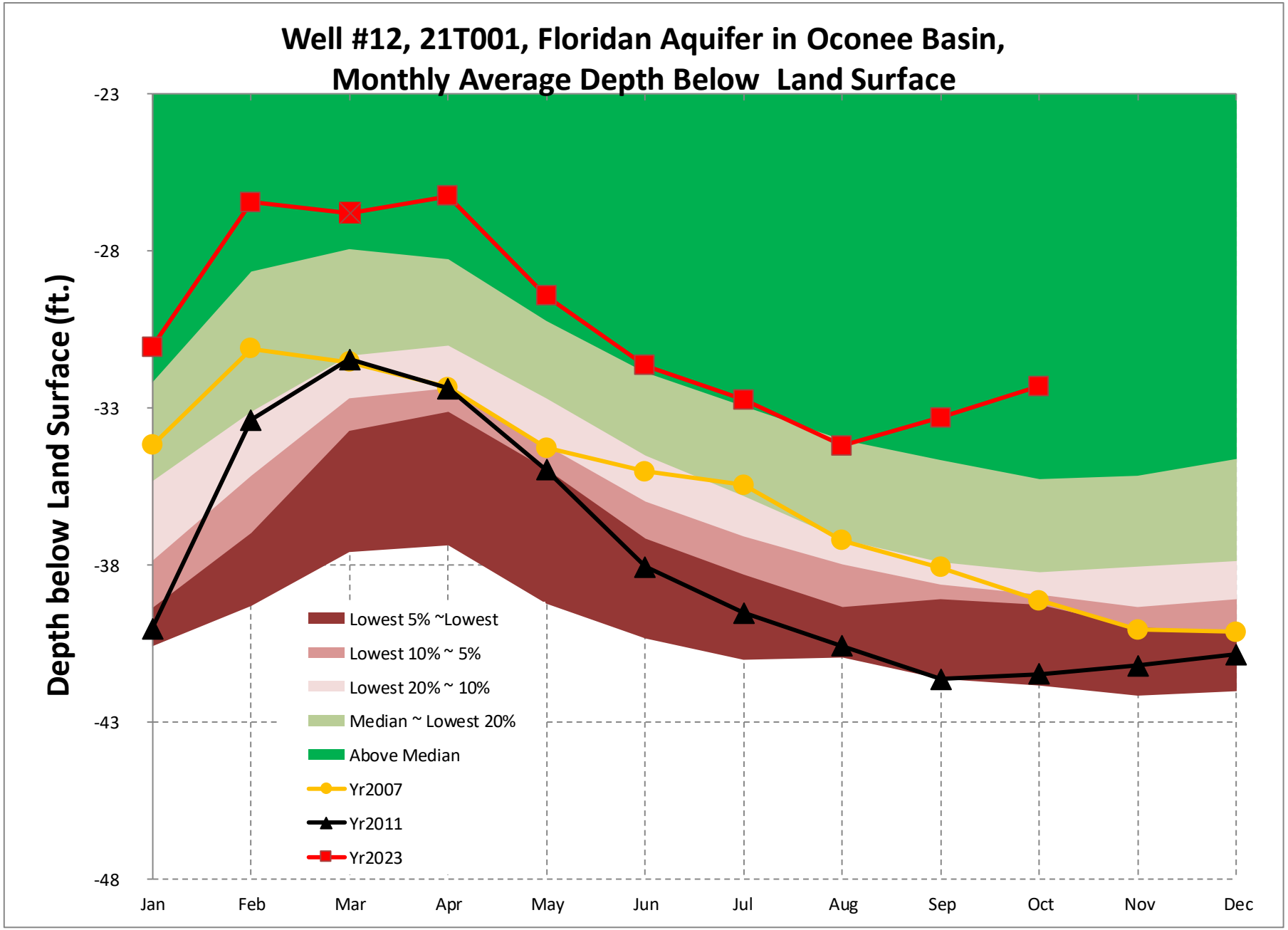

Well #10, 10G313, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-40
-45
-50
-55
-60
-65
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

Back to Map

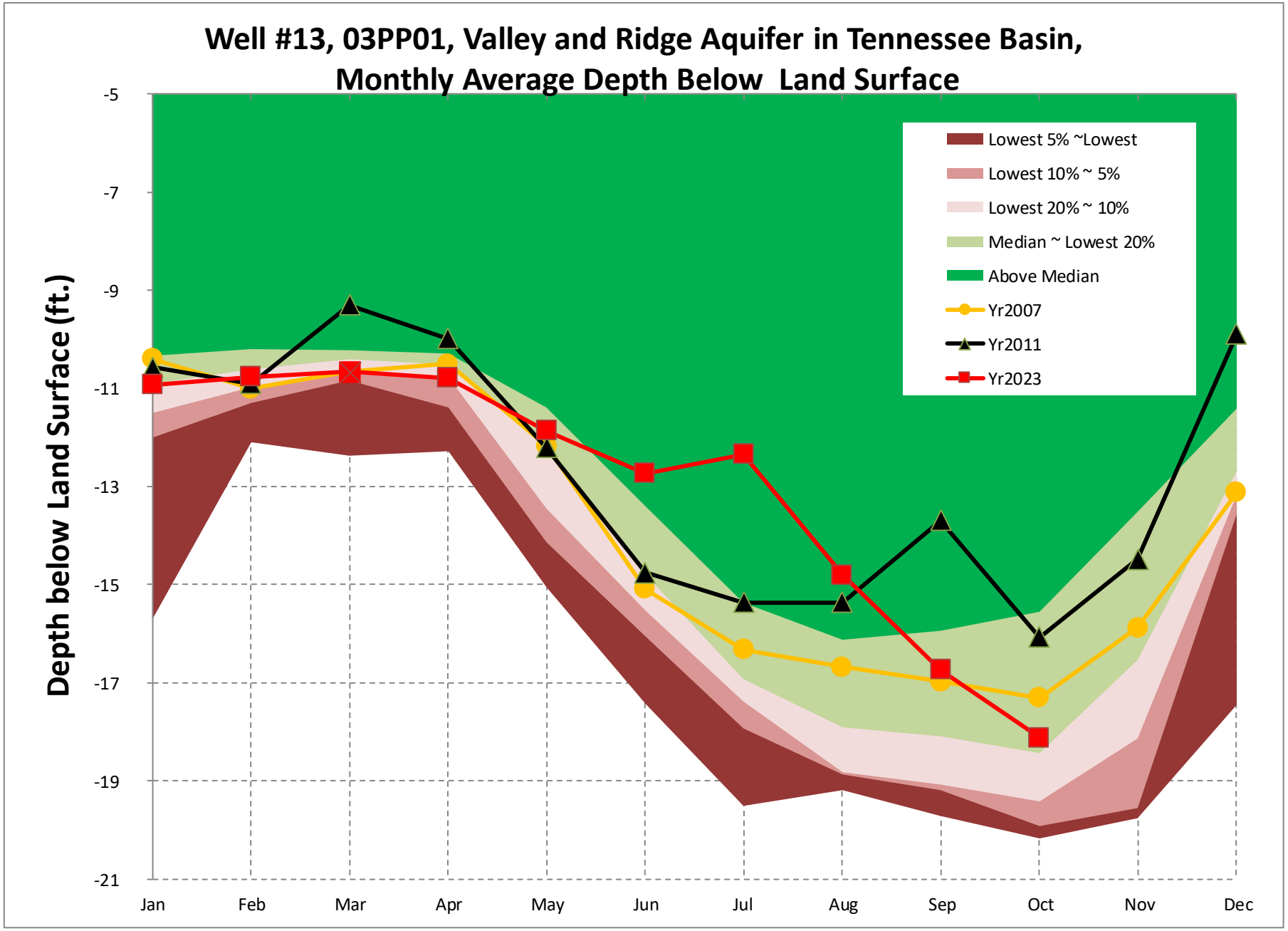


Back to Interpretation

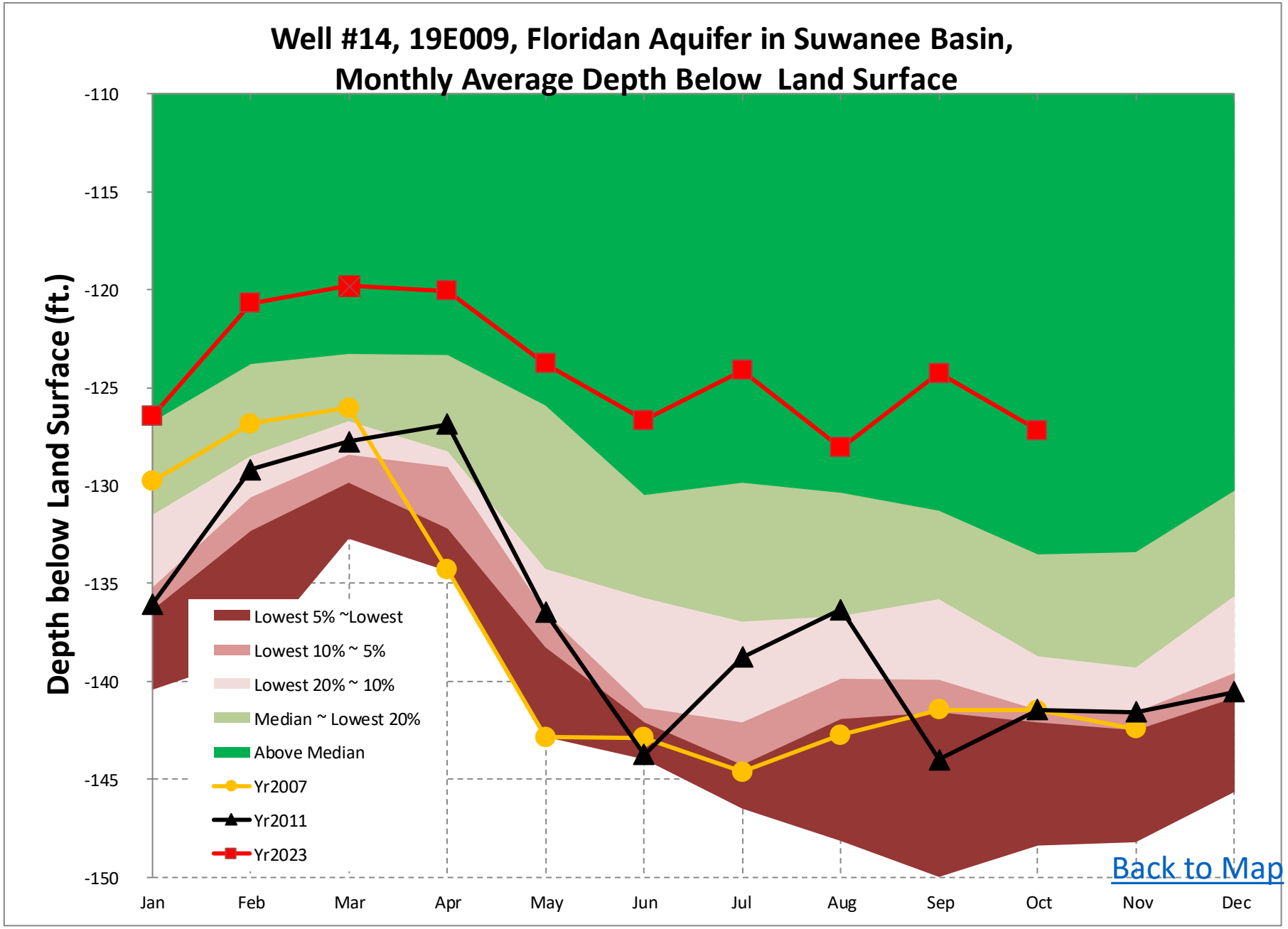
Back to Map


Well #12, 21T001, Floridan Aquifer in Oconee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-23
-28
-33
-38
-43
-48
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

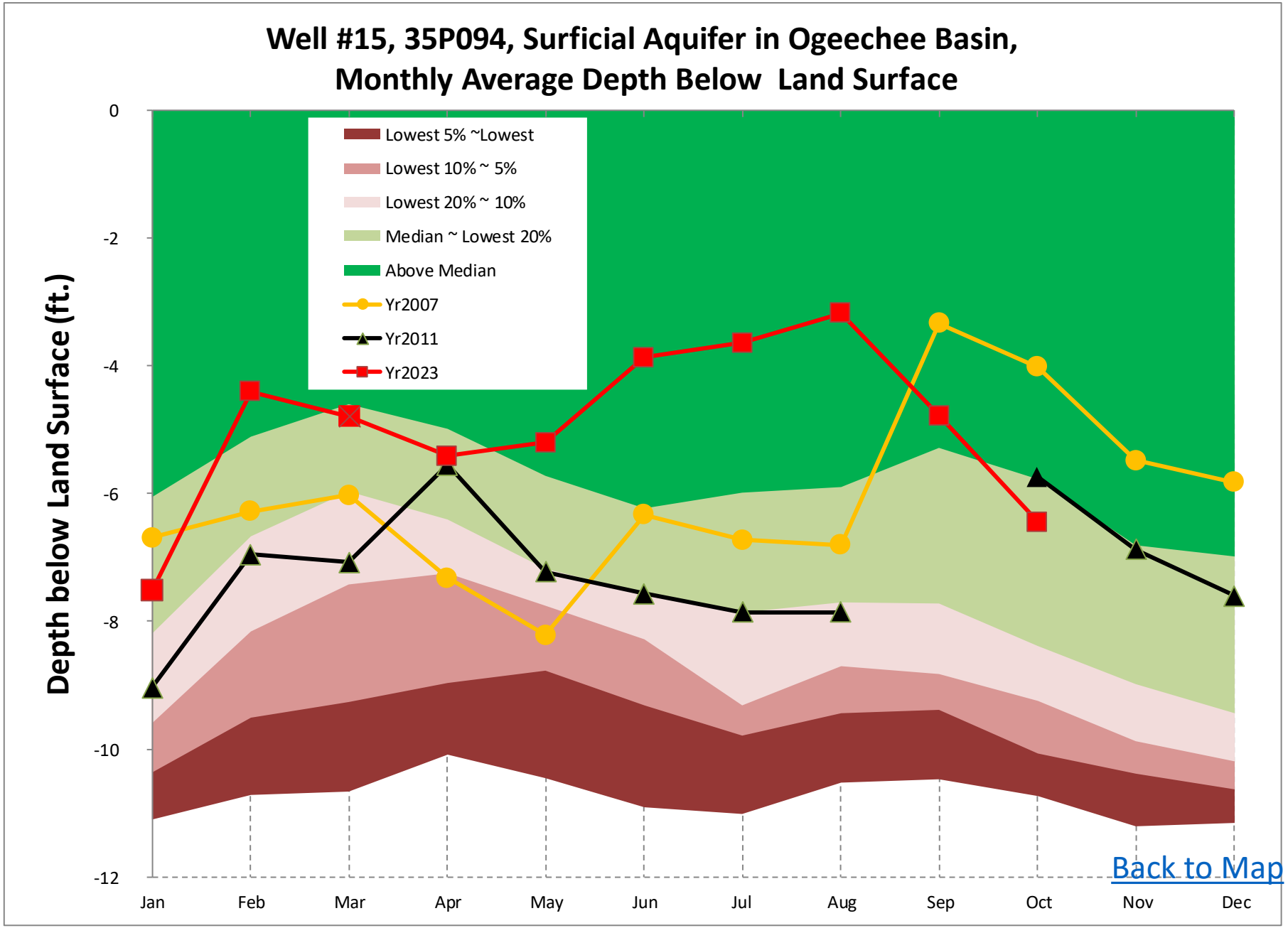
Back to Map


Well #13, 03PP01, Valley and Ridge Aquifer in Tennessee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-5
-7
-9
-11
-13
-15
-17
-19
-21
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

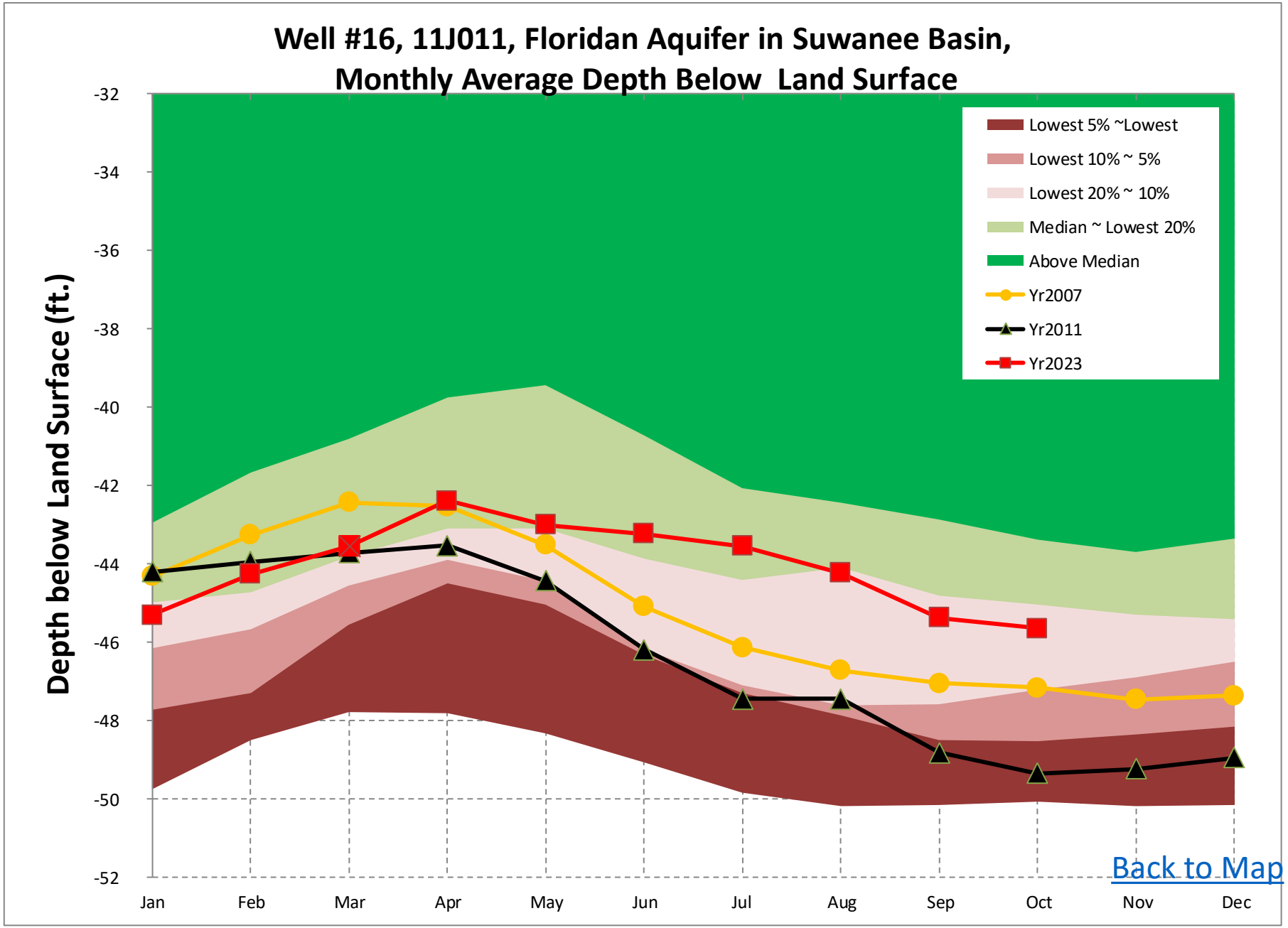
Back to Map


Well #14, 19E009, Floridan Aquifer in Suwanee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-110
-115
-120
-125
-130
-135
-140
-145
-150
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

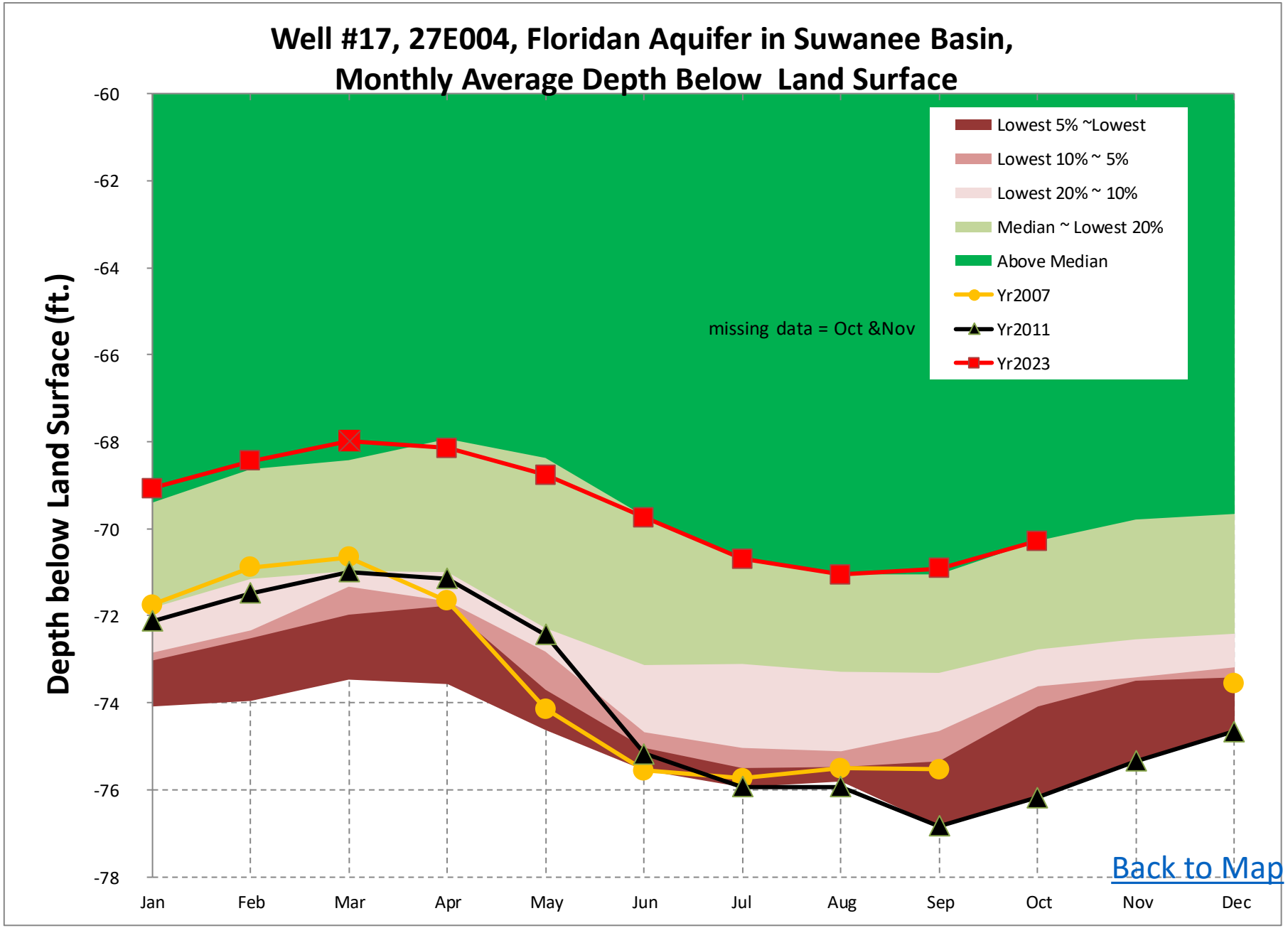
Back to Map


Well #15, 35P094, Surficial Aquifer in Ogeechee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
0
-2
-4
-6
-8
-10
-12
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

Back to Map


Well #16, 11J011, Floridan Aquifer in Suwanee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-32
-34
-36
-38
-40
-42
-44
-46
-48
-50
-52
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

Back to Map


Well #17, 27E004, Floridan Aquifer in Suwanee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-60
-62
-64
-66
-68
-70
-72
-74
-76
-78
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
missing data = Oct &Nov
Lowest 5% ~Lowest
Lowest 10% ~ 5%
Lowest 20% ~ 10%
Median ~ Lowest 20%
Above Median
Yr2007
Yr2011
Yr2023

Back to Map

Reservoir Levels

Data Source:
US Army Corps of Engineers

Coosa Basin
1. Carters
2. Allatoona

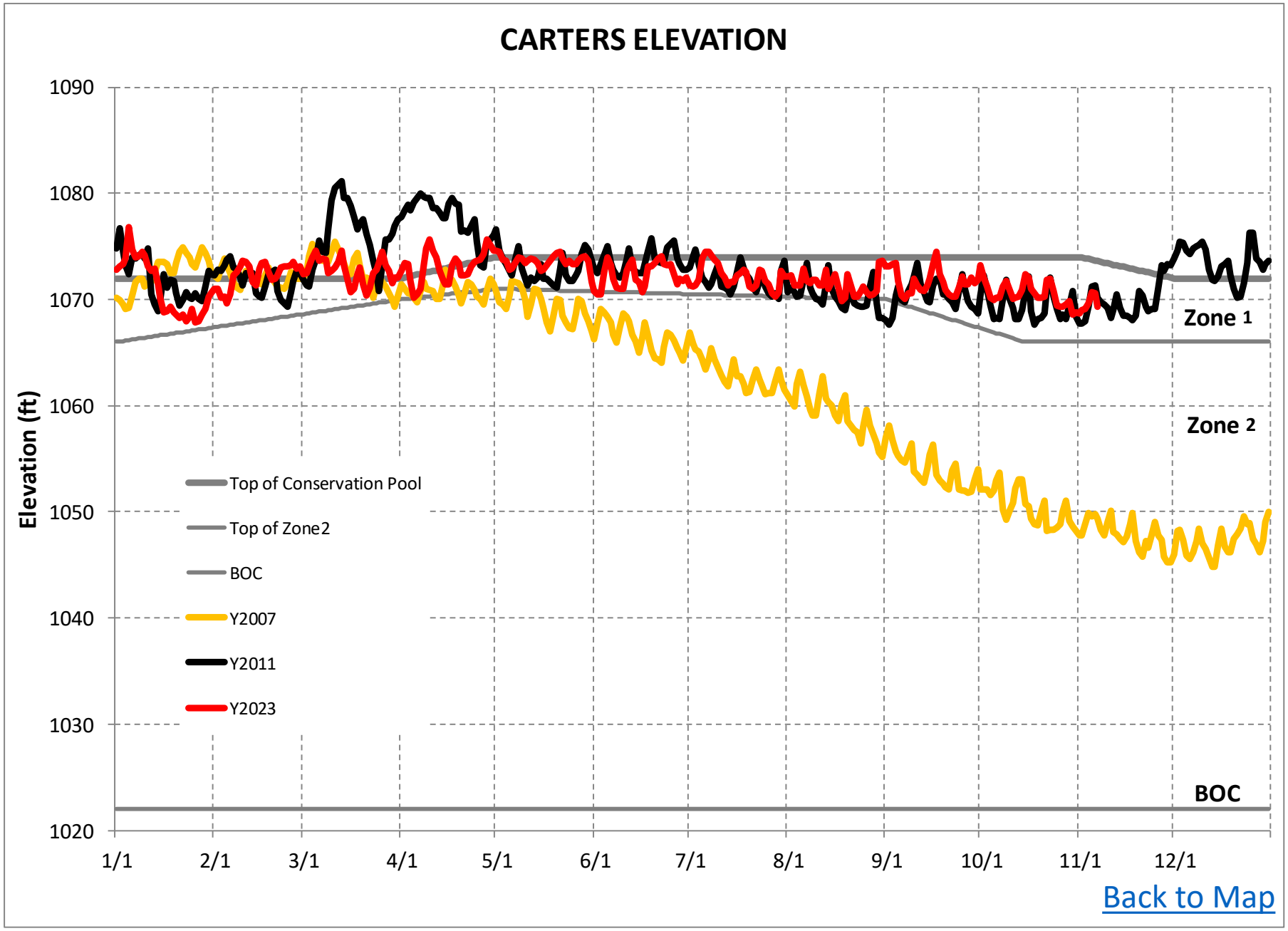
Chattahoochee Basin
3. Lanier
4. West Point
5. W.F. George

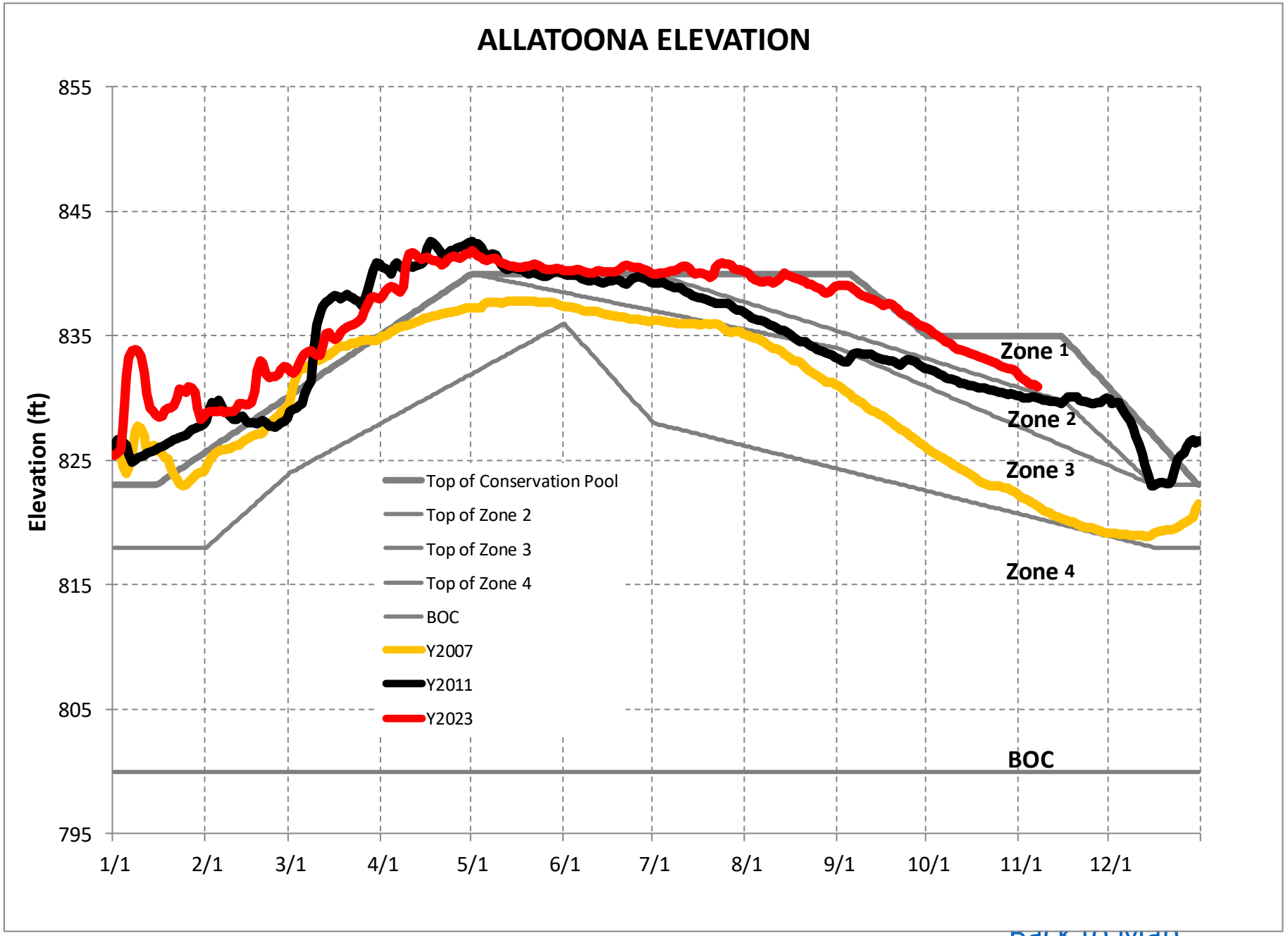
Savannah Basin
6. Hartwell
7. Thurmond

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

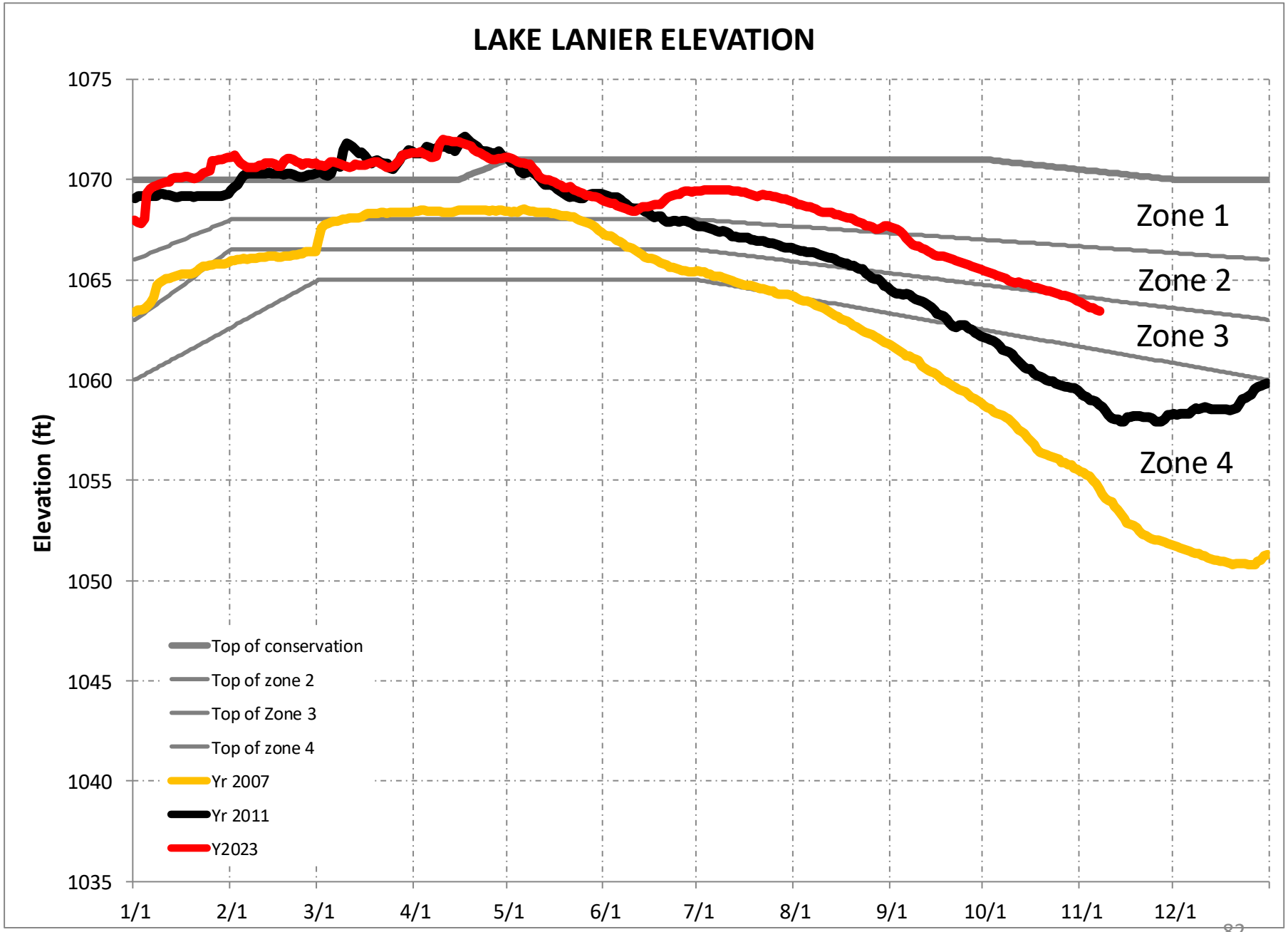
Reservoir Elevation Graphs

- The following graphs show the reservoir elevation curves for January 2023 through October 2023.
- 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 2023 reservoir elevations into perspective, elevations for 2007 and 2011 are also shown.

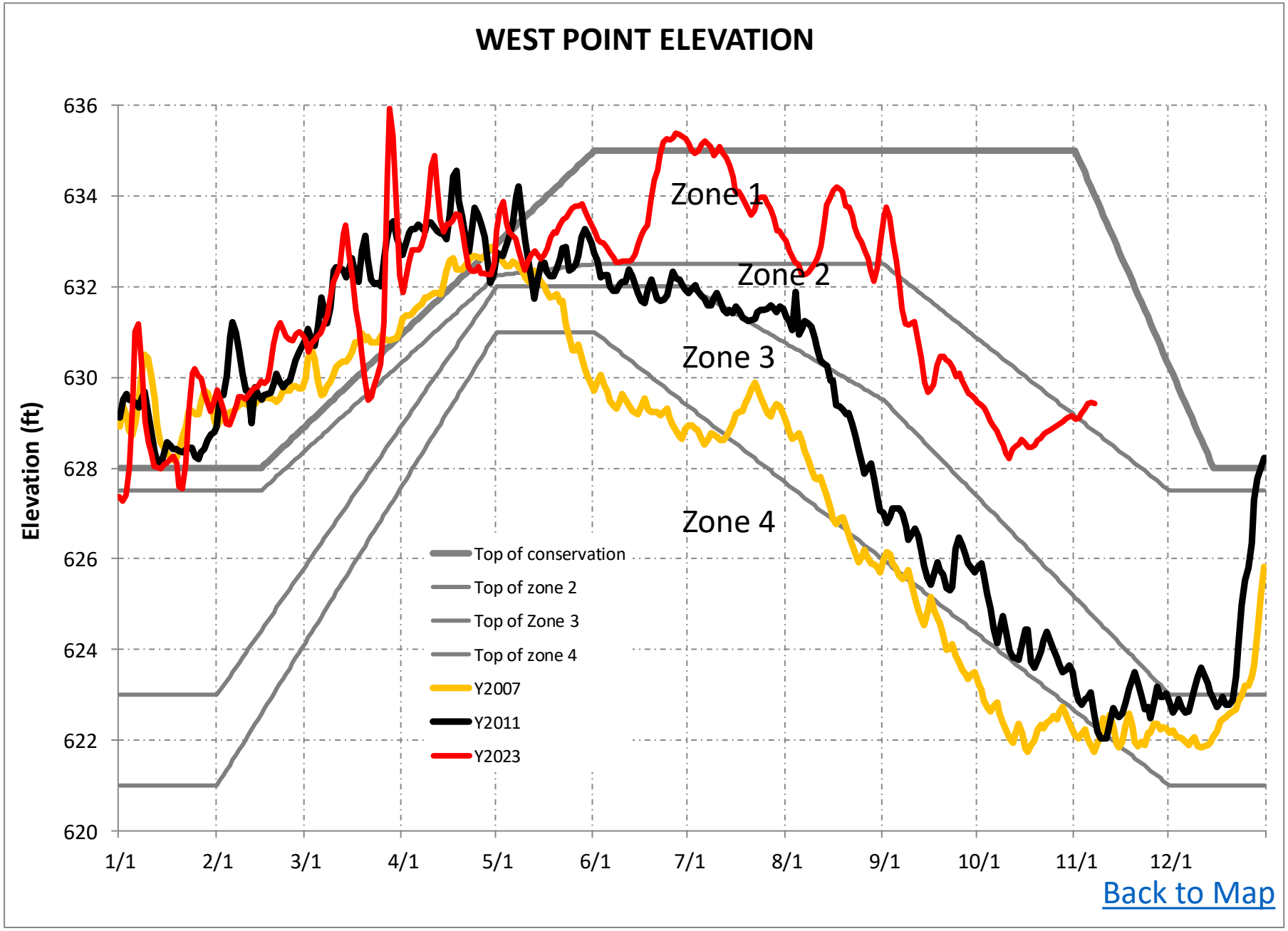

CARTERS ELEVATION
Elevation (ft)
1090
1080
1070
1060
1050
1040
1030
1020
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Top of Conservation Pool
Top of Zone2
BOC
Y2007
Y2011
Y2023
Zone 1
Zone 2
BOC
Back to Map

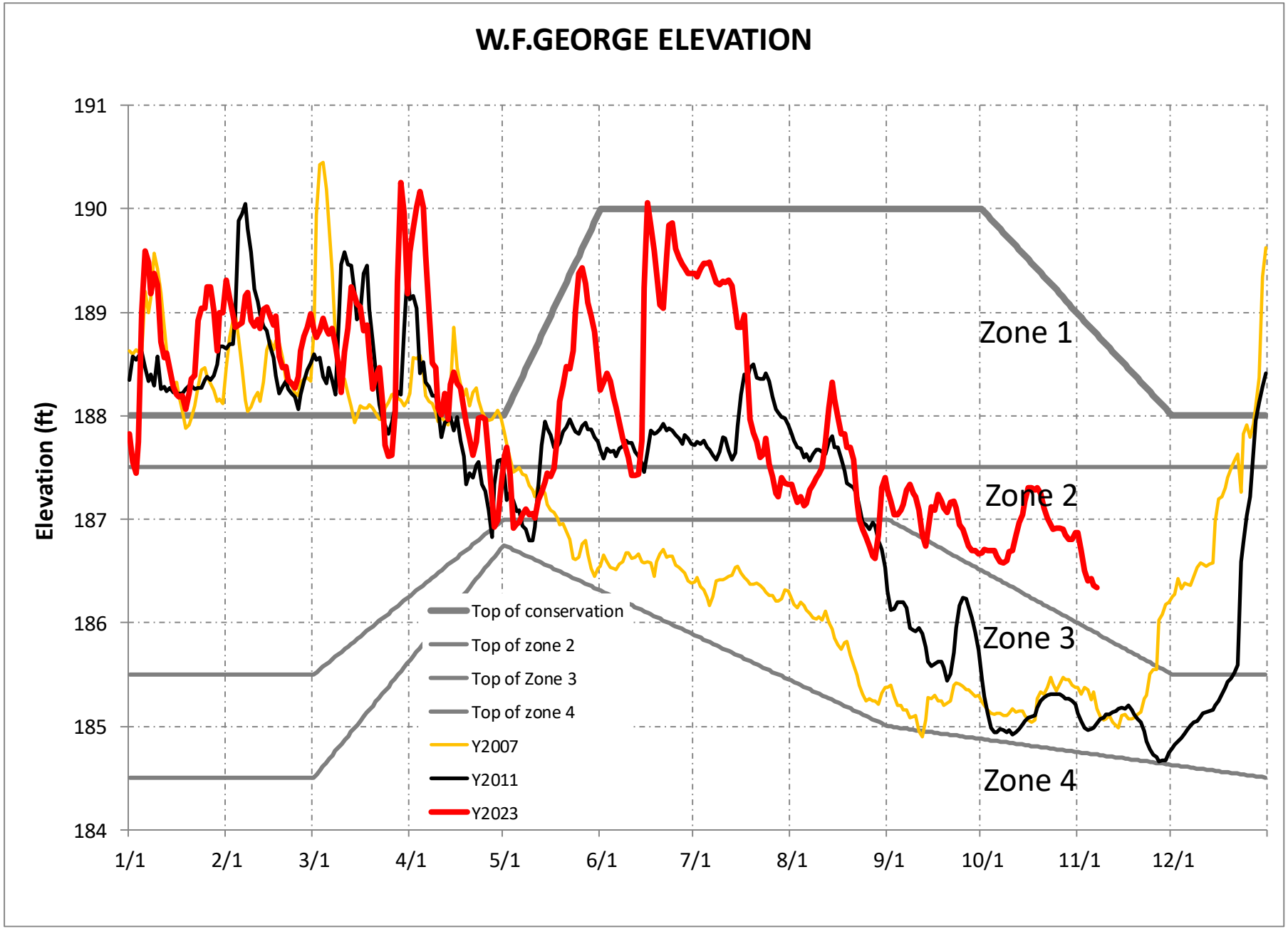

ALLATOONA ELEVATION
Elevation (ft)
855
845
835
825
815
805
795
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Top of Conservation Pool
Top of Zone 2
Top of Zone 3
Top of Zone 4
BOC
Y2007
Y2011
Y2023
Zone 1
Zone 2
Zone 3
Zone 4
BOC

Back to Map


LAKE LANIER ELEVATION
Elevation (ft)
1075
1070
1065
1060
1055
1050
1045
1040
1035
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Yr 2007
Yr 2011
Y2023

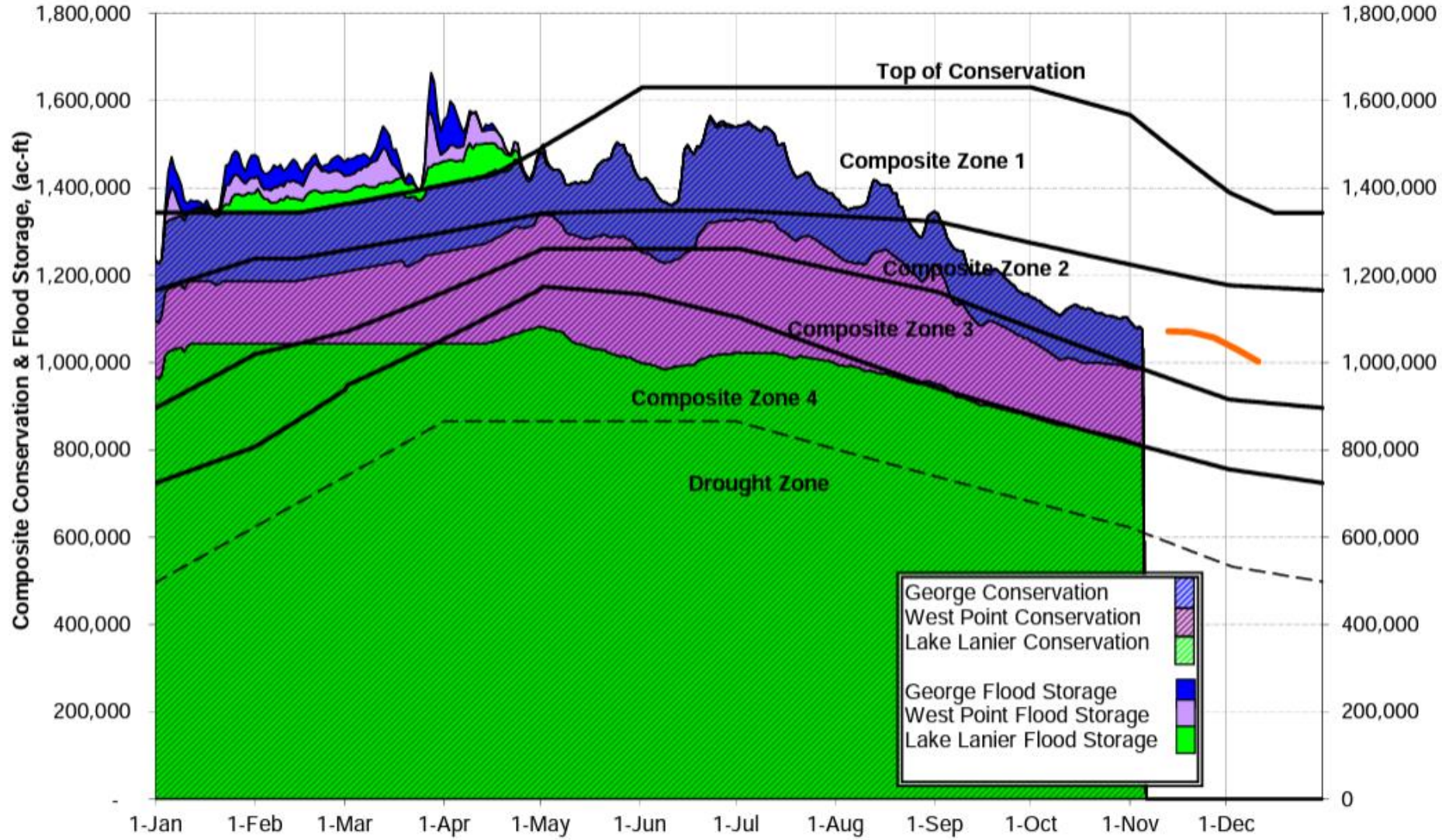
Back to Map


WEST POINT ELEVATION
Elevation (ft)
636
634
632
630
628
626
624
622
620
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Y2007
Y2011
Y2023
Back to Map


W.F.GEORGE ELEVATION
Elevation (ft)
191
190
189
188
187
186
185
184
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Y2007
Y2011
Y2023

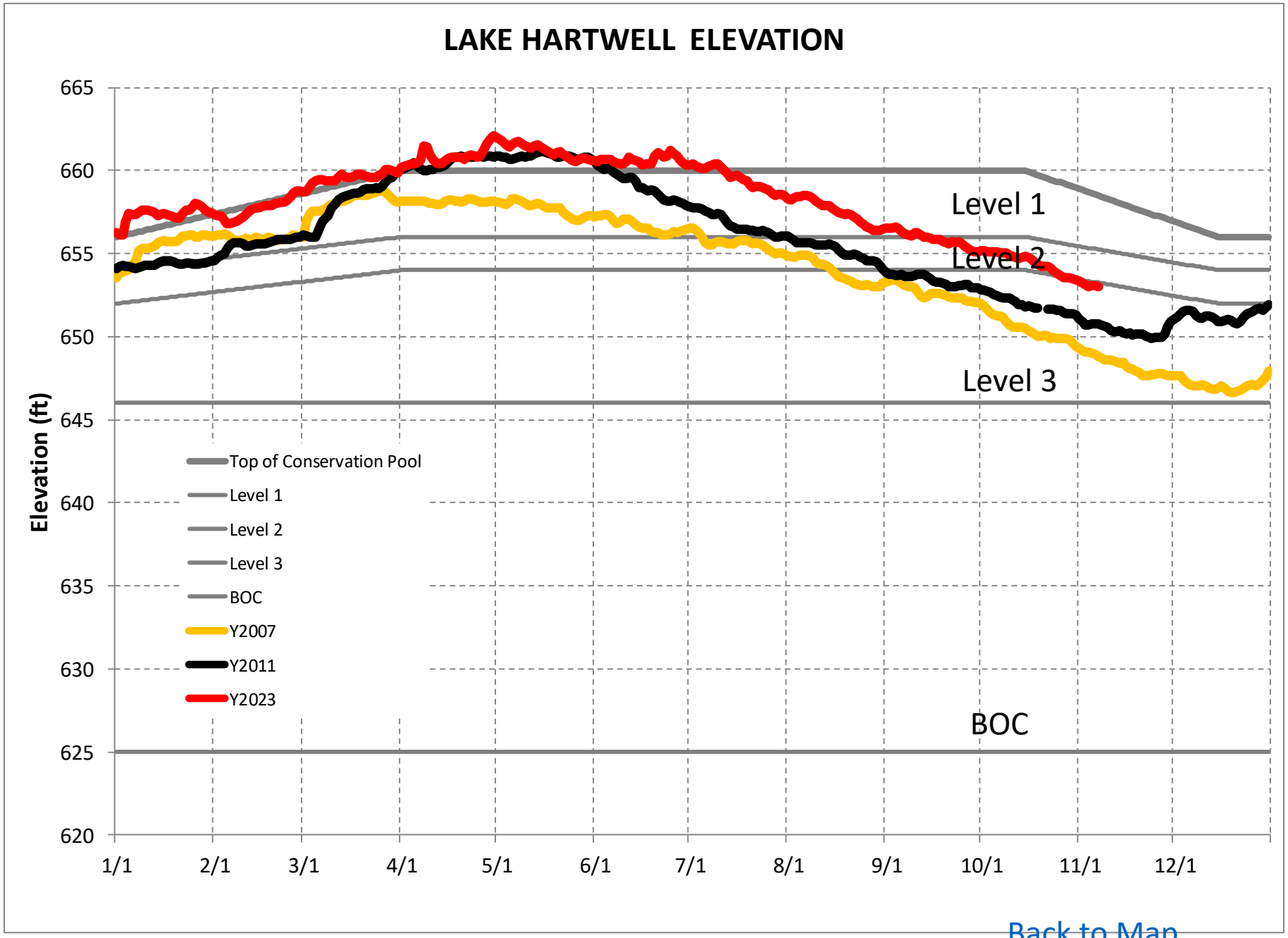
Back to Map

2023 ACF Basin Composite Conservation and Flood Storage

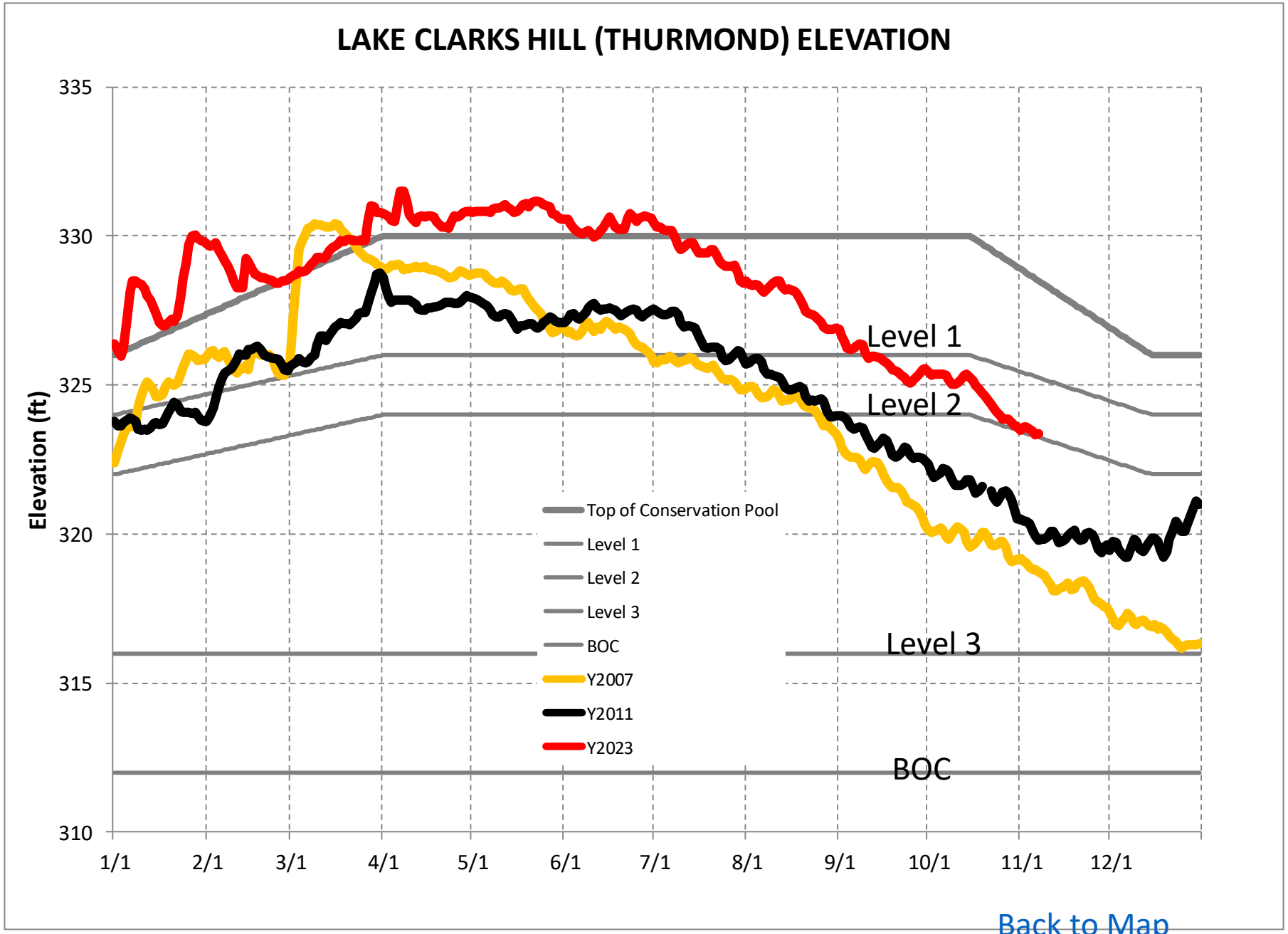


Actual data thru 11/06/2023

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


LAKE HARTWELL ELEVATION
Elevation (ft)
665
660
655
650
645
640
635
630
625
620
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Level 1
Level 2
Level 3
BOC
Top of Conservation Pool
Level 1
Level 2
Level 3
BOC
Y2007
Y2011
Y2023

Back to Map


LAKE CLARKS HILL (THURMOND) ELEVATION
Elevation (ft)
335
330
325
320
315
310
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Level 1
Level 2
Level 3
BOC
Top of Conservation Pool
Level 1
Level 2
Level 3
BOC
Y2007
Y2011
Y2023

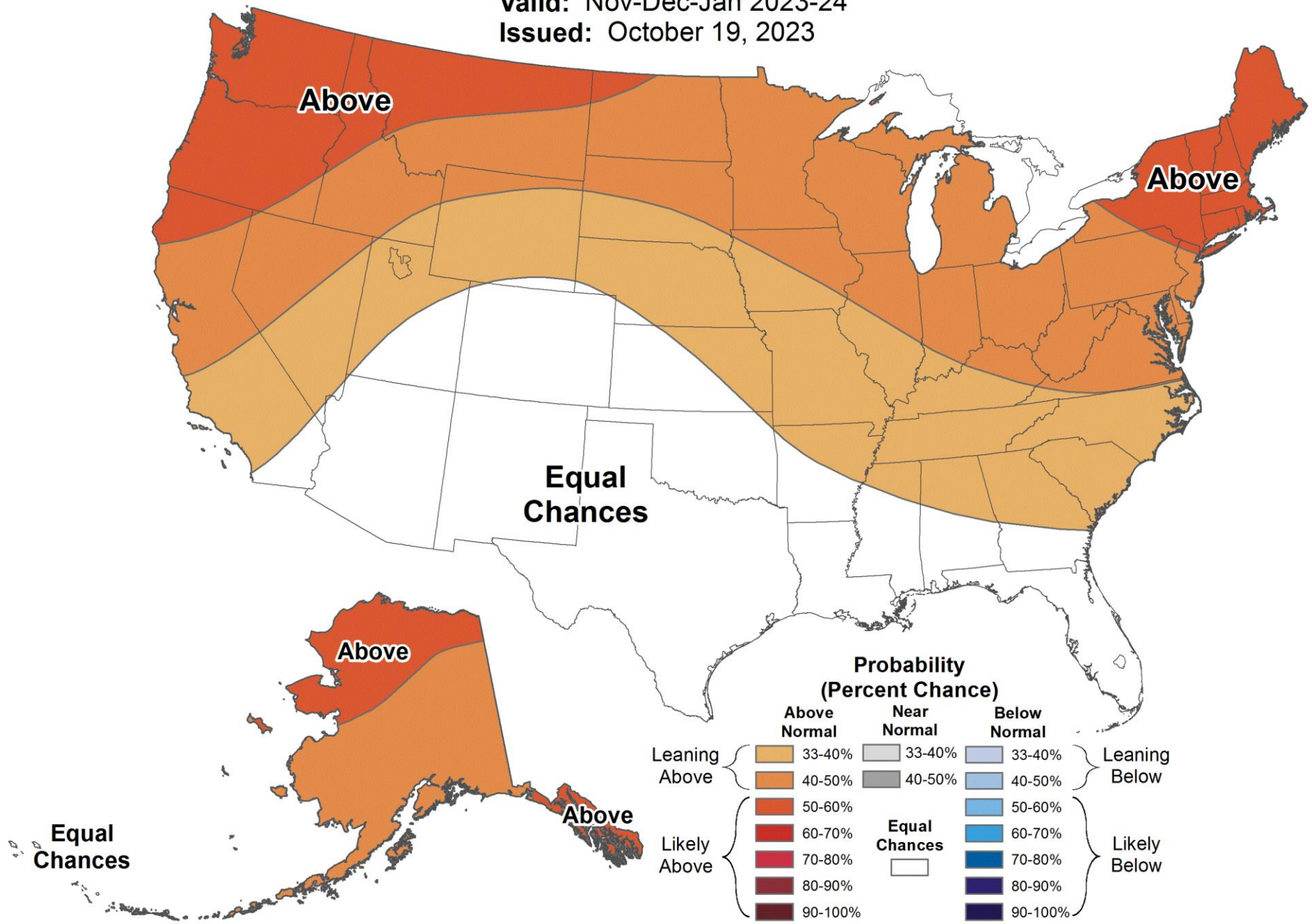
Back to Map

Probability Outlook and Seasonal Drought Outlook

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

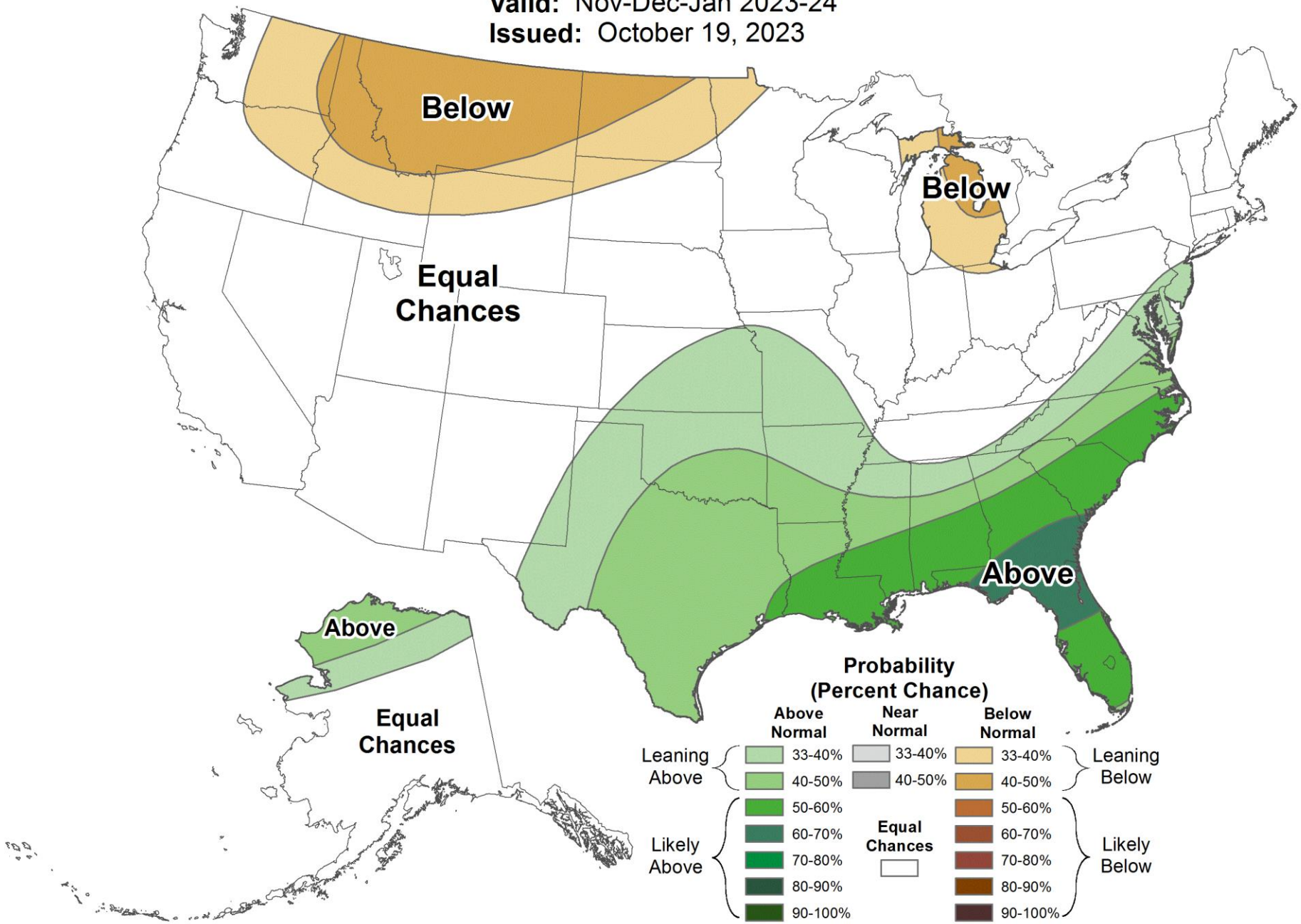
Seasonal Temperature Outlook

Valid: Nov-Dec-Jan 2023-24
Issued: October 19, 2023



Seasonal Precipitation Outlook

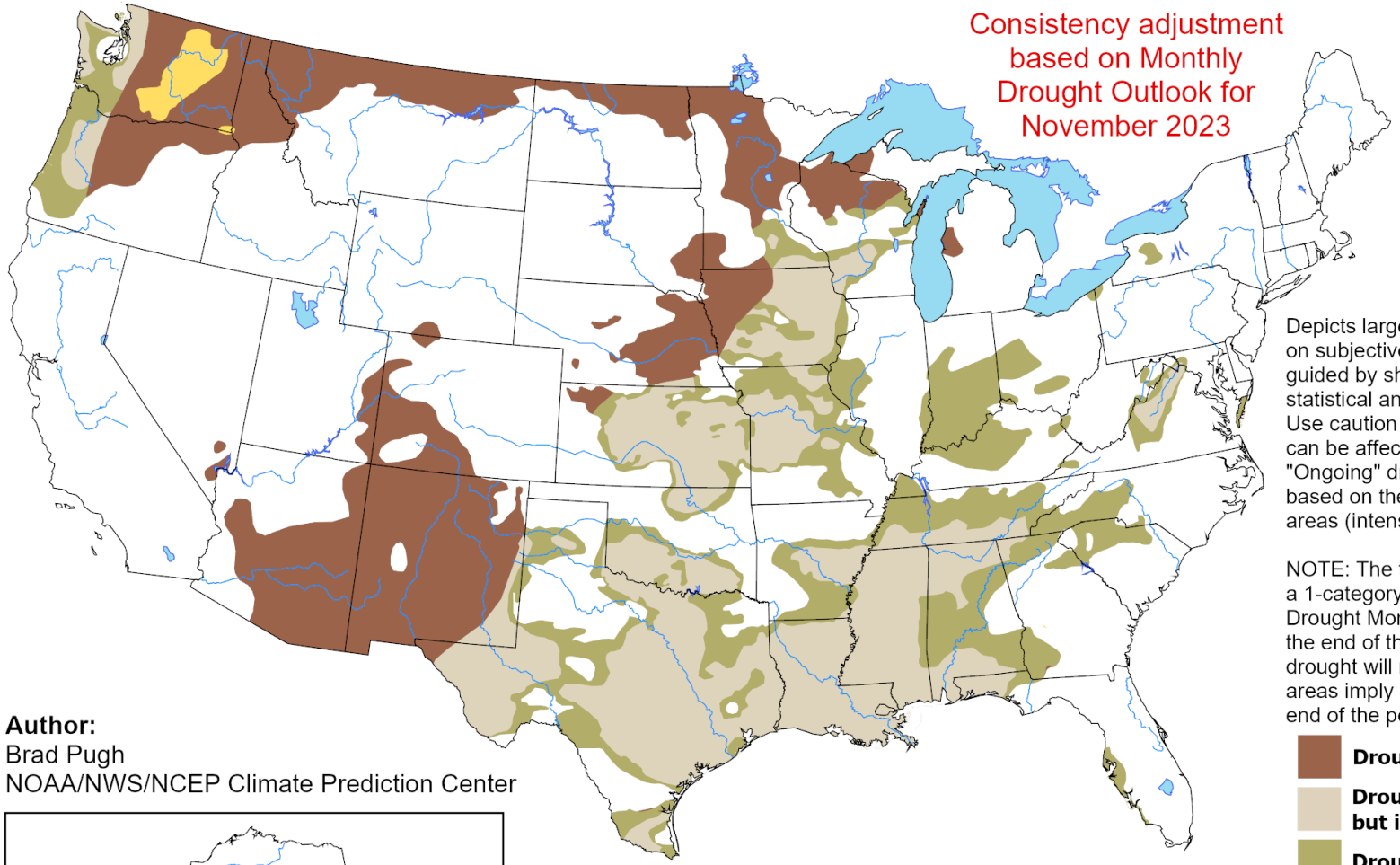
Valid: Nov-Dec-Jan 2023-24
Issued: October 19, 2023



U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for November 1, 2023 - January 31, 2024
Released October 31, 2023

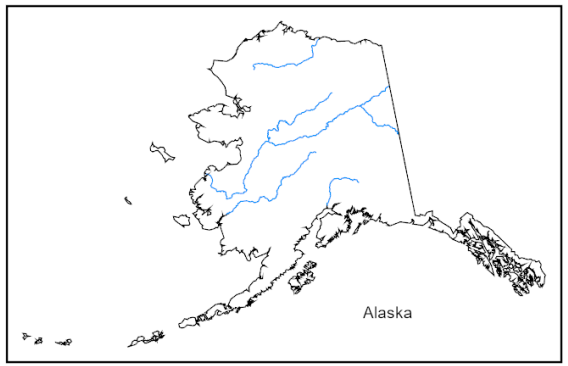


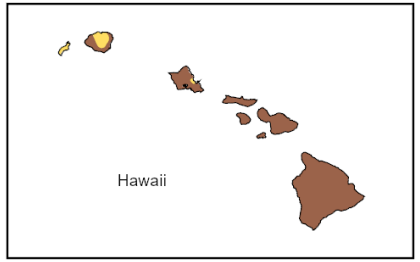
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to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

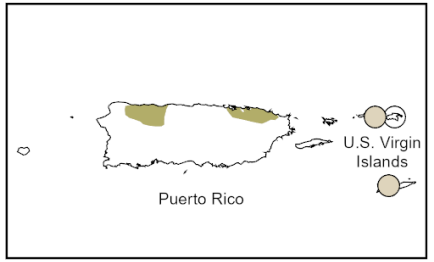
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

- **Drought persists**
- **Drought remains, but improves**
- **Drought removal likely**
- **Drought development likely**
- **No drought**

Author:
Brad Pugh
NOAA/NWS/NCEP Climate Prediction Center







https://go.usa.gov/3eZ73