# Drought Indicators Report

Georgia Environmental Protection Division

November 2019

# 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 7, 2019.

# Drought Indicator Analysis Summary (slide 1 of 2)

- **U.S. Drought Monitor** – Drought improved but remains statewide, except parts of 10 counties in northwest GA and parts of 19 counties in south GA. Extreme Drought (D3) no longer exists statewide. Severe Drought (D2) exists in parts of the Metro area and its northeast surrounding area as well as a small isolated area in south GA. Moderate Drought (D1) exists in half of the state area. Abnormally dry (D0, the least intense level) exists in one third of the state area, mainly in parts of northwest GA and south GA.
- **Precipitation -** Three-month precipitation is below normal statewide, with above normal in south GA. Six-month precipitation is below normal statewide, with slightly above normal in isolated areas in south GA. Twelve-month precipitation is largely normal or above normal statewide, with below normal in parts of the mid-east GA and southeast GA.
- **Soil Moisture -** Compared to the previous month, soil moisture conditions have improved significantly statewide. Some light dryness ($20^{th}$ – $30^{th}$ percentiles) exists in parts of Hall, Bacon, Ware, Thomas, Brooks, Lowndes and Clinch counties.

# Drought Indicator Analysis Summary (slide 2 of 2)

- **Streamflow** – Stream flows at most selected USGS gages are below normal (28 out of 34). Fourteen gages are between the driest 20th percentile and median. Seven gages are in the driest 10th - 20th percentiles (each in middle Chattahoochee, upper Ocmulgee, upper Oconee, upper Savannah and lower Ogeechee basins, and two in lower Suwanee basins). Four gages are in the driest 5th - 10th percentiles (each in middle Ocmulgee, lower Savannah, lower Ogeechee and lower Suwanee basins). Three gages are below the driest 5th percentile (each in lower Oconee, lower Satilla, and lower St. Marys basins).
- **Groundwater Level** – Groundwater levels observed at most selected wells are below normal (14 out of 17). Nine wells are between the lowest 20th percentile and median. Two wells are in the lowest 10th - 20th percentiles and two wells are in the lowest 5th -10th percentiles (all in Floridan Aquifer system in southern GA). One well is below the lowest 5th percentile (Crystalline Rocks Aquifer in northeast GA).
- **Reservoir Levels** – In October 2019, all federal reservoirs in Georgia (ACF, ACT, and Savannah River Basins) are below their respective top of conservation (normal) pools. Carters, Lanier, West Point, and WF George keep in their respective Zone 1. Allatoona and Hartwell were initially below their respective Zone 1/Level 1, but back to Zone 1/Level 1 at the end of the month. Clarks Hill keeps below its Level 1 but remains above Level 2.
- **Short-term Climate Prediction** - National Climatic Prediction Center projects above normal temperature and equal chance of precipitation statewide in November 2019 – January 2020. U.S. Drought Outlook predicts drought removal likely in most of the state and drought remains but improves in current D2 areas and their surrounding areas in mid October 2019 – January 2019.
- **Water Supplies** – EPD has granted Drought Response Level 2 Variances to City of Griffin, Coweta County, and City of Forsyth.

# US Drought Monitor

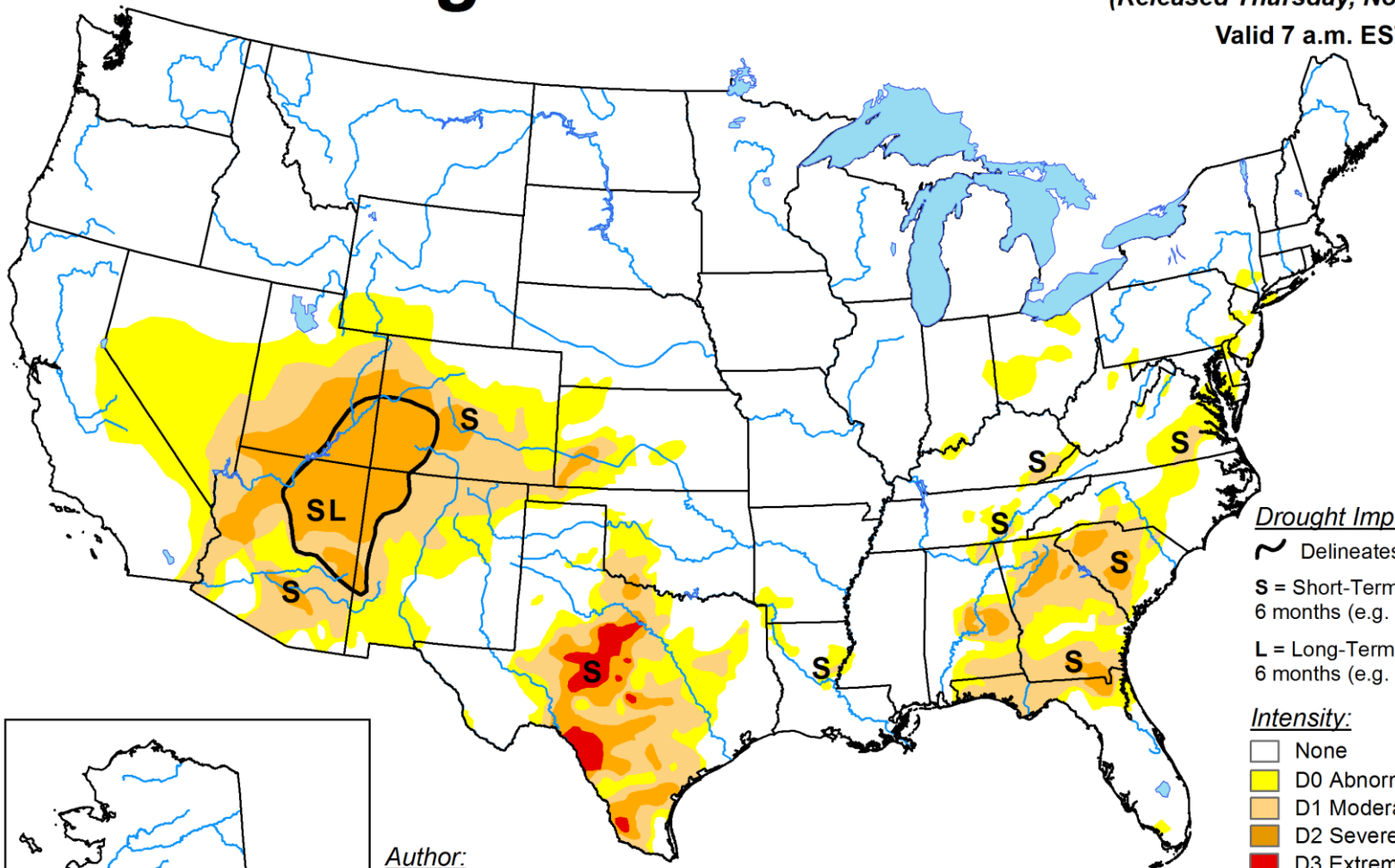
Data Source:
http://droughtmonitor.unl.edu/

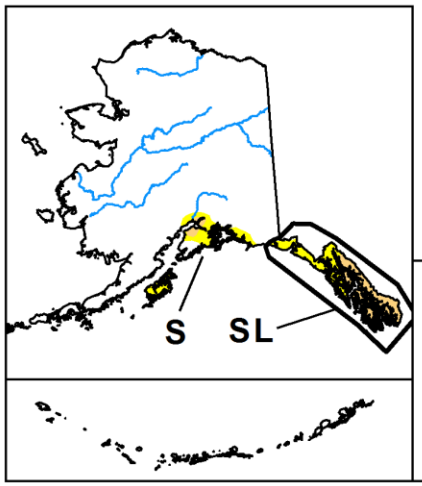
# U.S. Drought Monitor

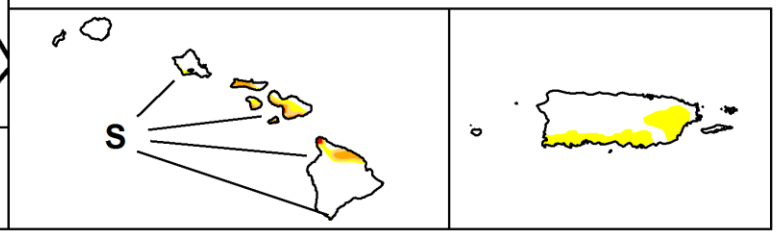
**November 5, 2019**

***(Released Thursday, Nov. 7, 2019)***

**Valid 7 a.m. EST**





*Author:*

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Western Regional Climate Center


*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:*

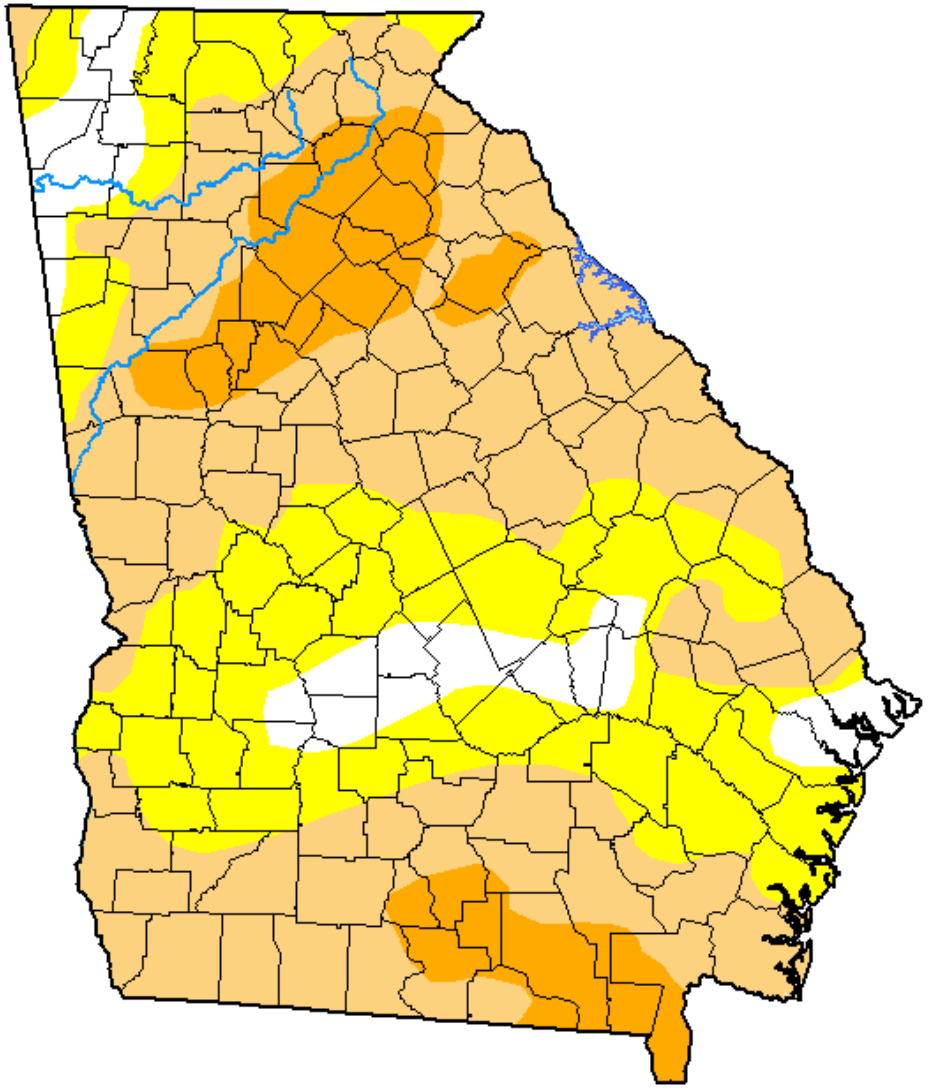
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

USDA NDMC NOAA

**droughtmonitor.unl.edu**

# U.S. Drought Monitor
# Georgia



## November 5, 2019
***(Released Thursday, Nov. 7, 2019)***
**Valid 7 a.m. EST**

*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 8.71 | 91.29 | 60.87 | 12.56 | 0.00 | 0.00 |
| **Last Week** *10-29-2019* | 3.89 | 96.11 | 81.67 | 28.98 | 2.35 | 0.00 |
| **3 Months Ago** *08-06-2019* | 75.77 | 24.23 | 5.50 | 0.00 | 0.00 | 0.00 |
| **Start of Calendar Year** *01-01-2019* | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Start of Water Year** *10-01-2019* | 0.00 | 100.00 | 61.58 | 28.35 | 4.49 | 0.00 |
| **One Year Ago** *11-06-2018* | 80.45 | 19.55 | 3.46 | 0.00 | 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. See accompanying text summary for forecast statements.*

*Author:*
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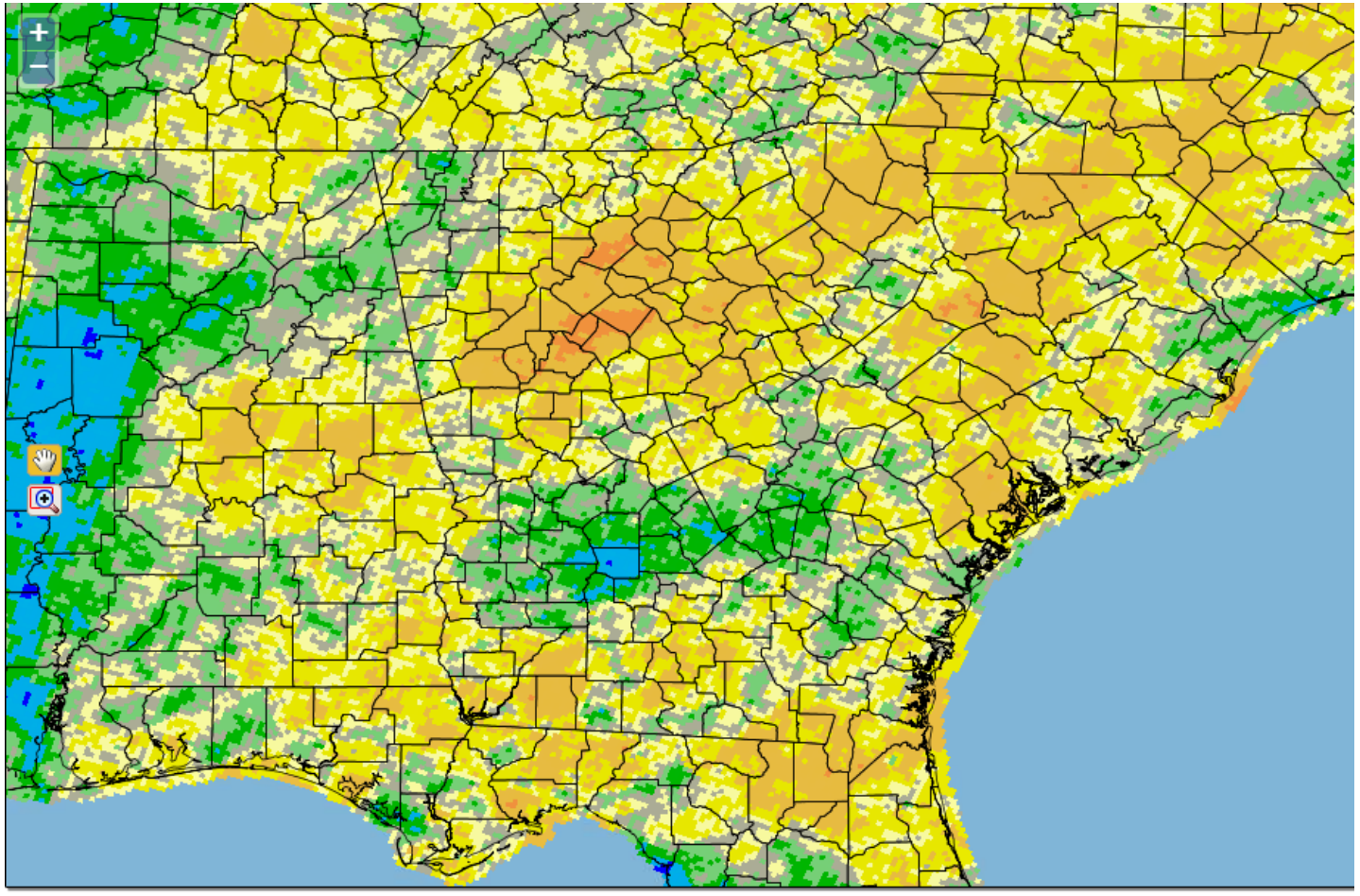
Western Regional Climate Center

**droughtmonitor.unl.edu**

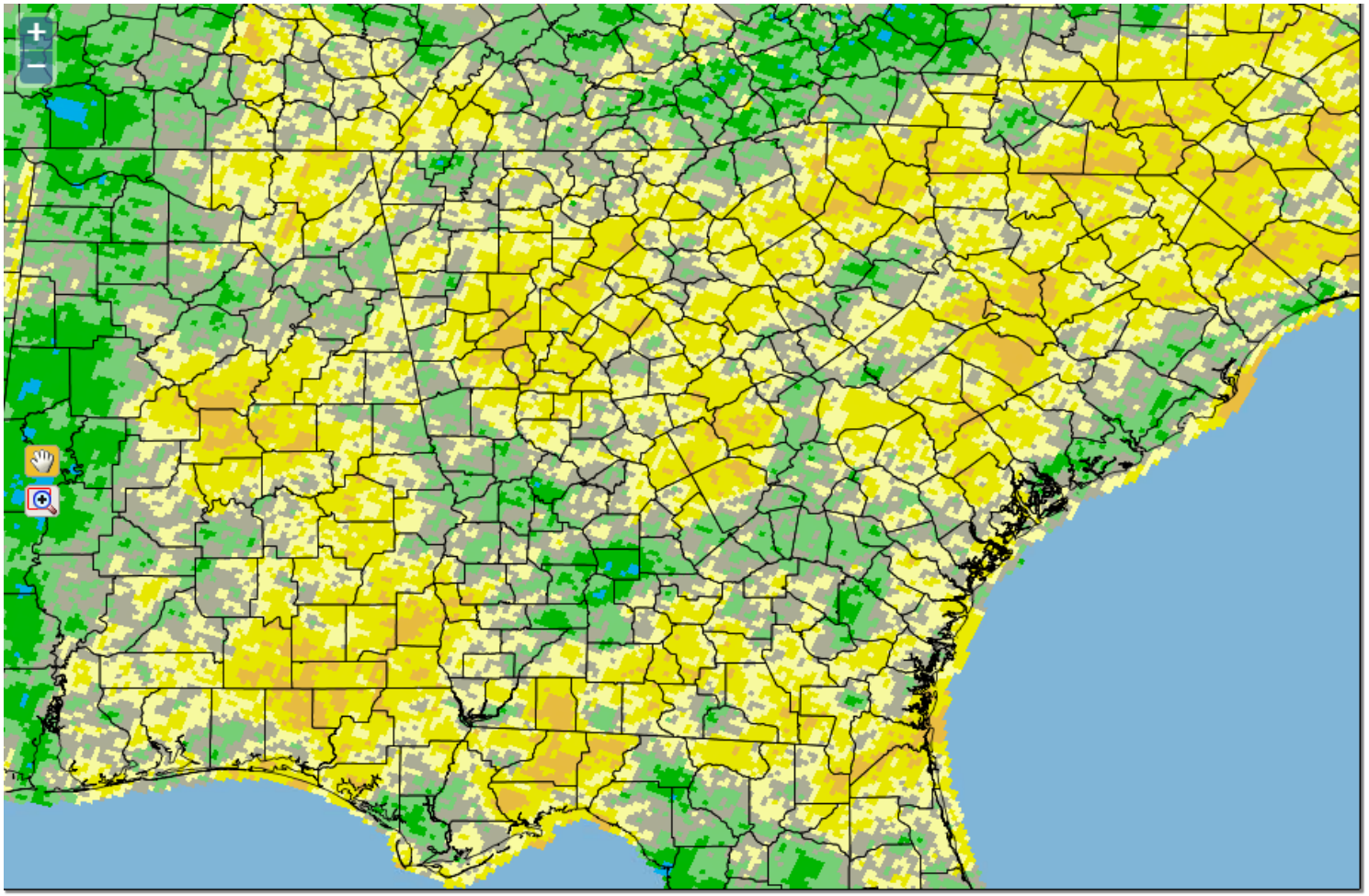
# 3, 6, and 12 Month Percent of Normal Precipitation

Data Source:
http://climate.ncsu.edu/drought/map

# 3 Month Percent of Normal Precipitation



# 6 Month Percent of Normal Precipitation



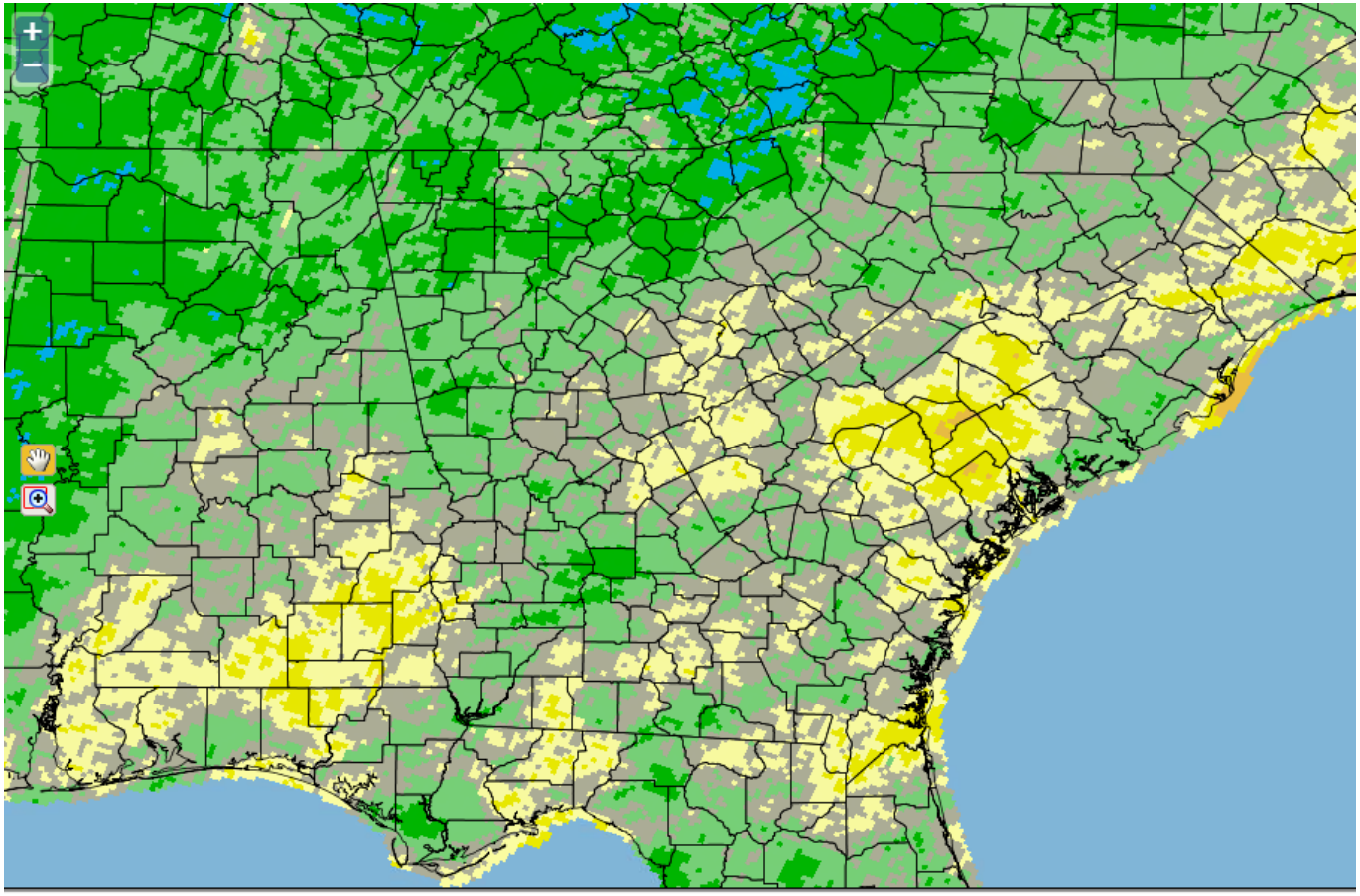
**6 month Percent of Normal Precipitation for November 04, 2019**

0 5 10 25 50 75 90 100 110 125 150 200 300 400 600 %

Transparency:

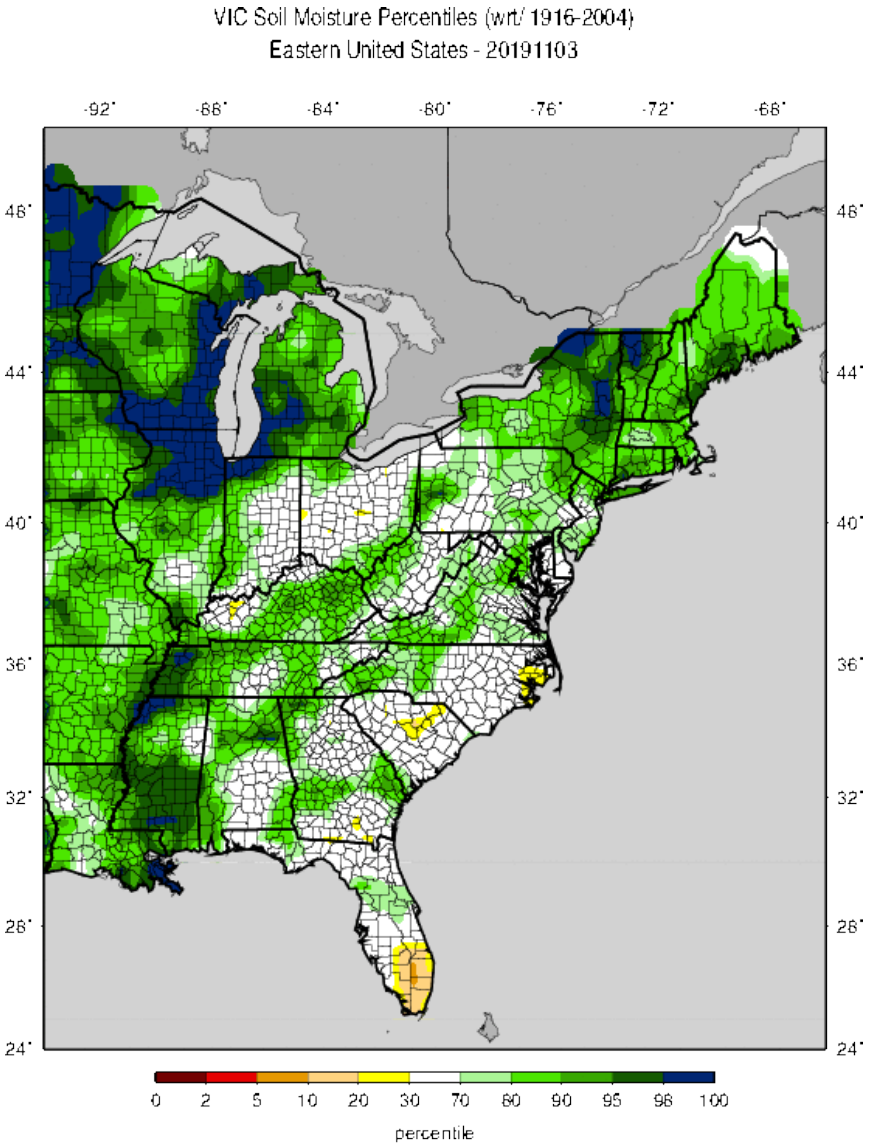
DOWNLOAD GEOTIFF

# 12 Month Percent of Normal Precipitation



# Soil Moisture Conditions

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



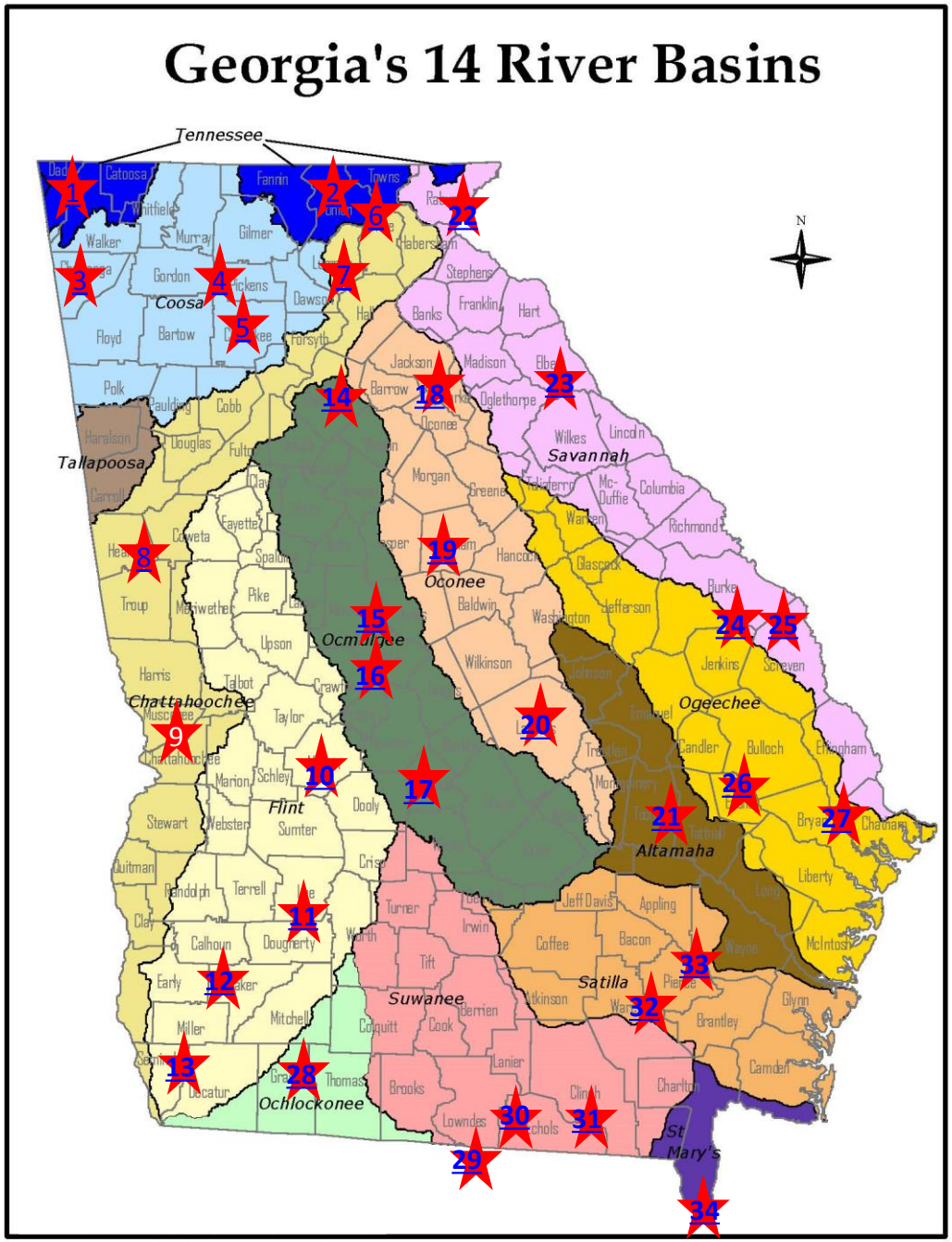

Current (daily updated) percentiles for soil moisture (SWE) with respect to the climatological period (1916-2004).

# 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 2019 through October 2019;
- 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 :

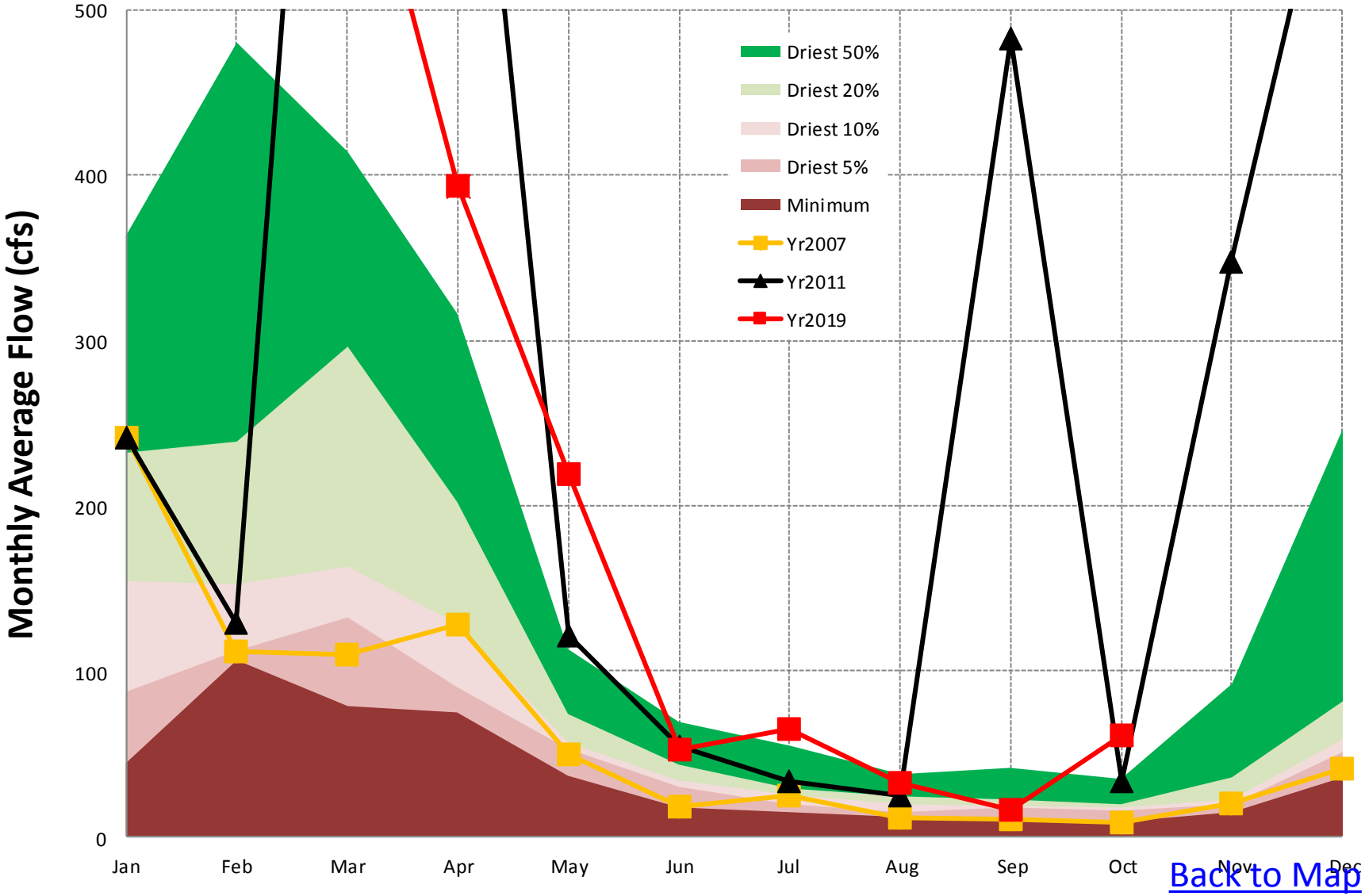
- Average stream flow for October 2019 was 486 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2019 about 36% of the time; about 64% of the time in October it has been higher.
- Average stream flow in 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 only 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 only 1% of the time; 99% 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 for October 2019 was 1,639 cfs. The statistical composite of all historical data for this gage shows that average streamflow in October has historically been lower than October 2019 about 20% of the time; about 80% 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 1% of the time; about 99% of the time in October it has been higher.
- Average stream flow in October 2007 was 1,104 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% of the time; about 98% of the time in October it has been higher.

# Gage #1. USGS #03568933, Tennessee Basin, LOOKOUT CREEK NEAR NEW ENGLAND, GA

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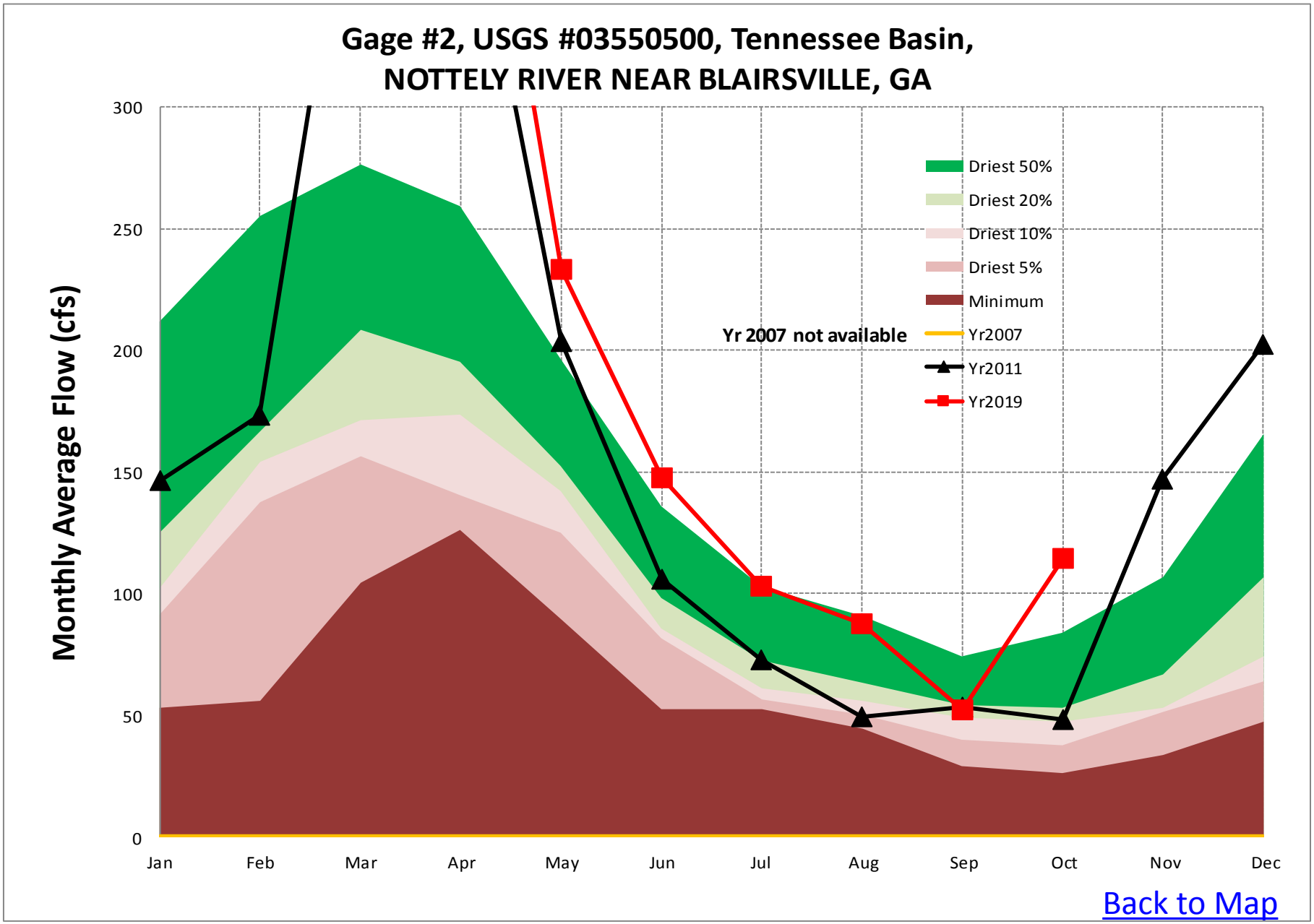
Gage #2, USGS #03550500, Tennessee Basin,
NOTTELY RIVER NEAR BLAIRSVILLE, GA
Monthly Average Flow (cfs)
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019
Yr 2007 not available

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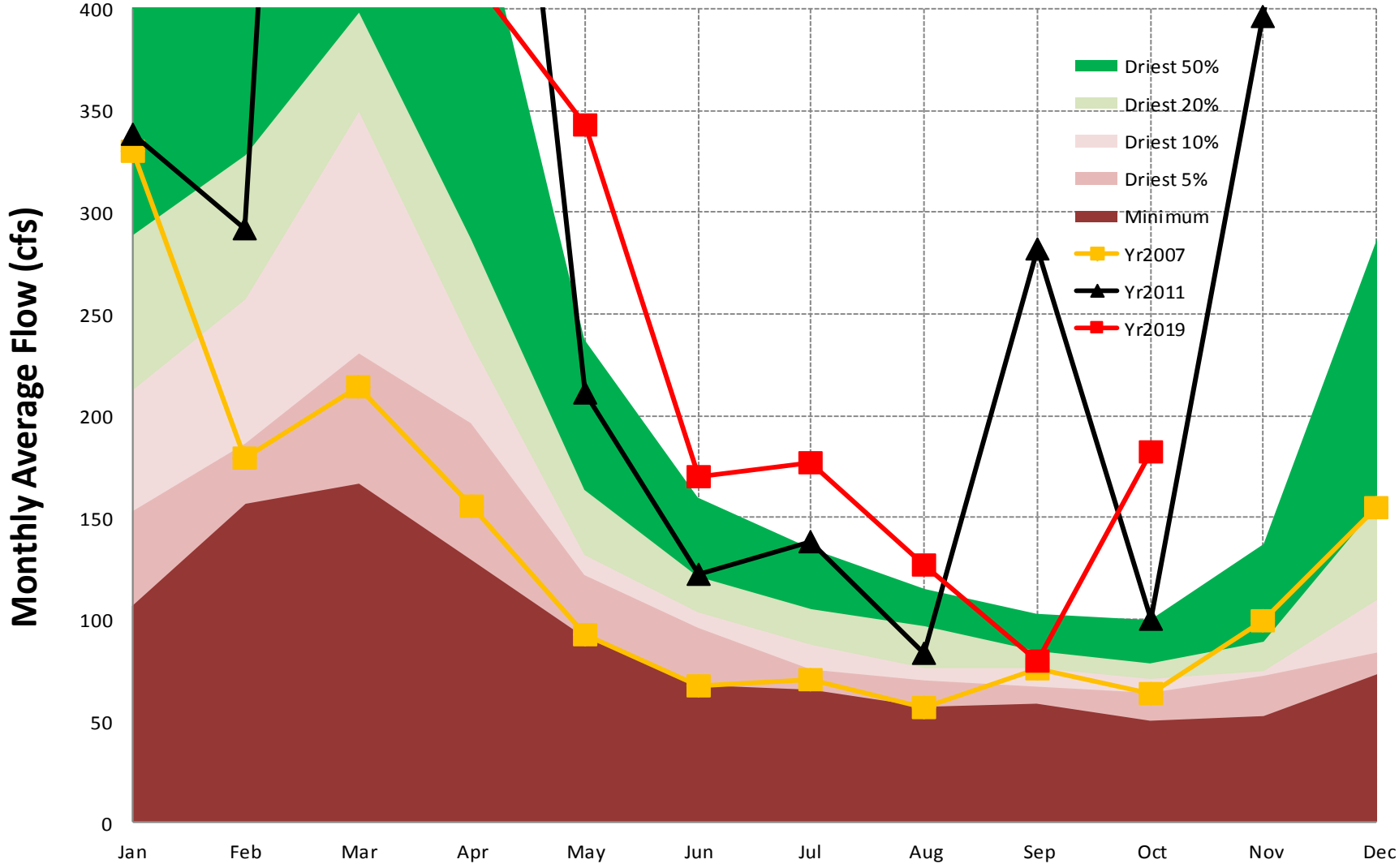
## Gage #3. USGS #02398000, Coosa Basin, Chattooga River at Summerville, GA

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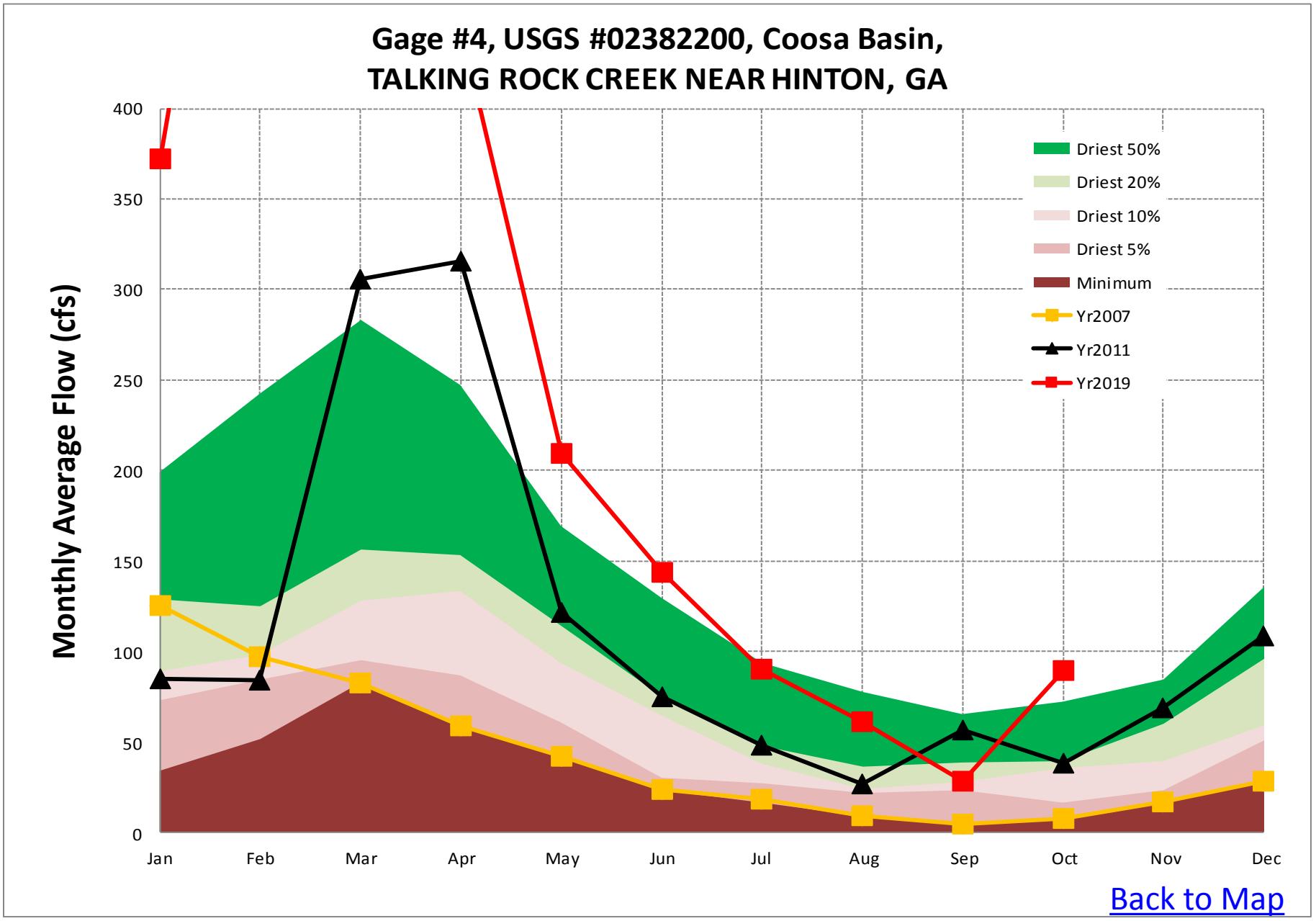
Gage #4, USGS #02382200, Coosa Basin,
TALKING ROCK CREEK NEAR HINTON, GA
Monthly Average Flow (cfs)
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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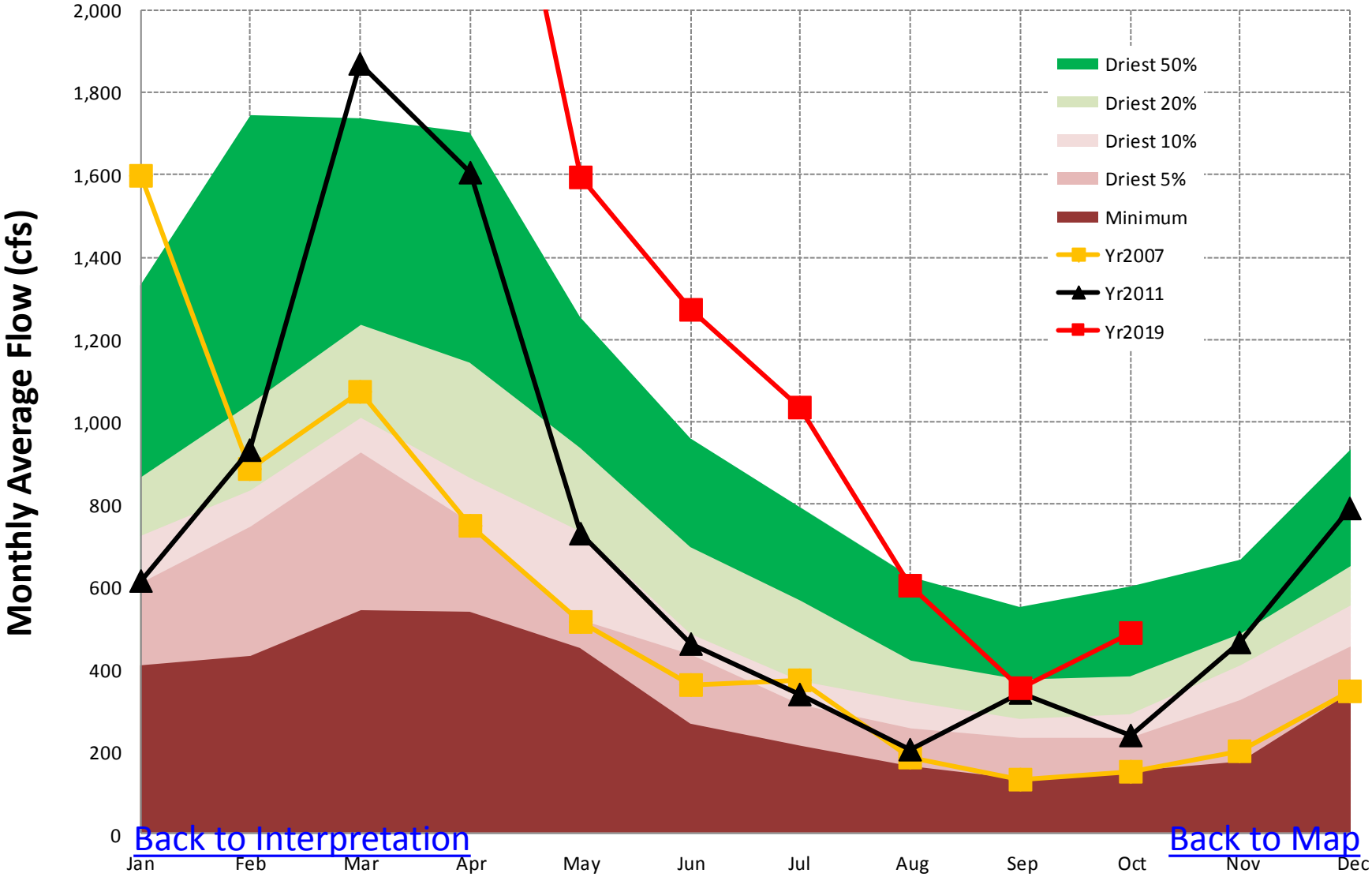
# Gage #5, USGS #02392000, Coosa Basin, Etowah River at Canton, GA

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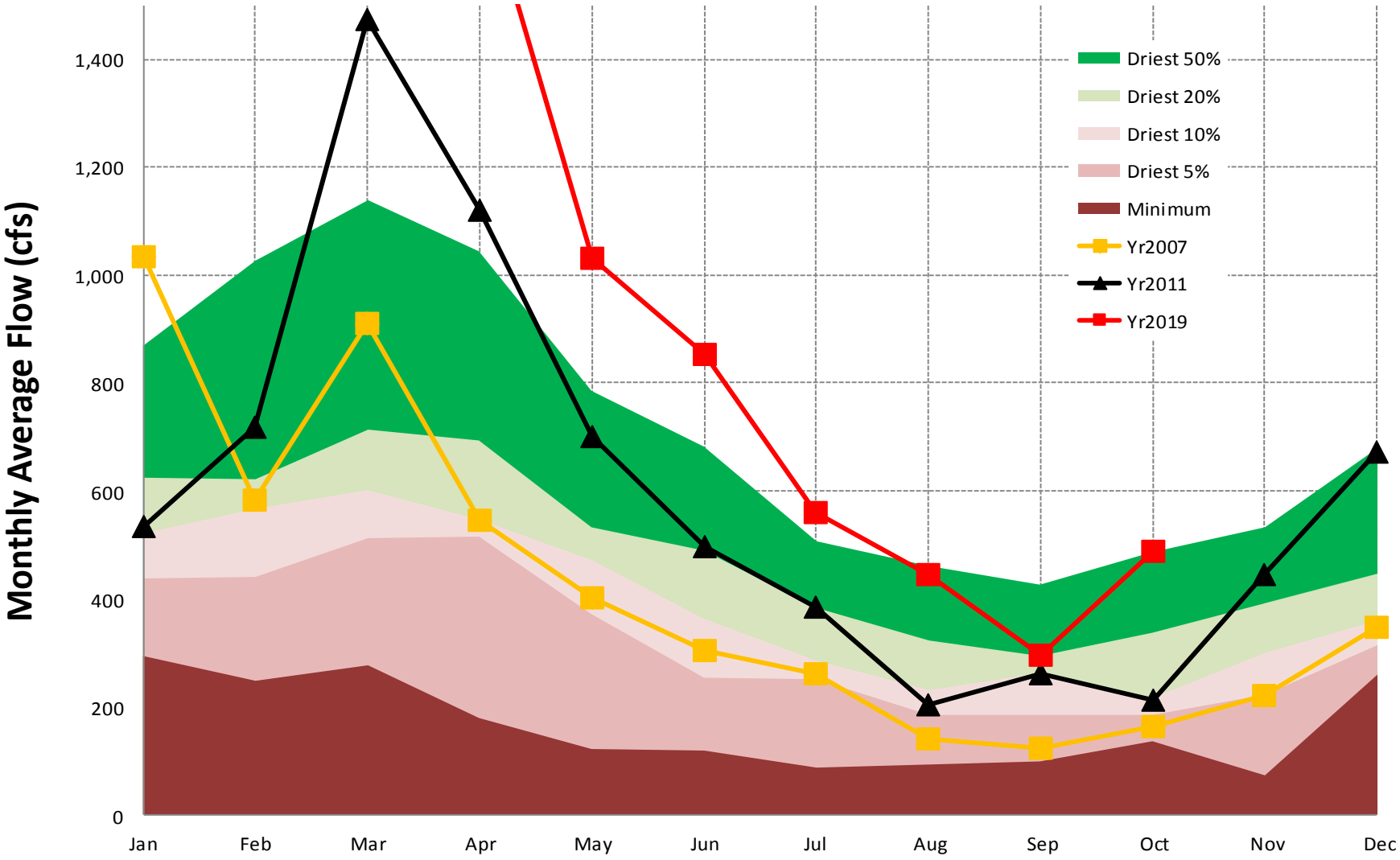
# Gage #6, USGS #02331600, Chatthoochee Basin, CHATTAHOOCHEE RIVER AT CORNELIA, GA

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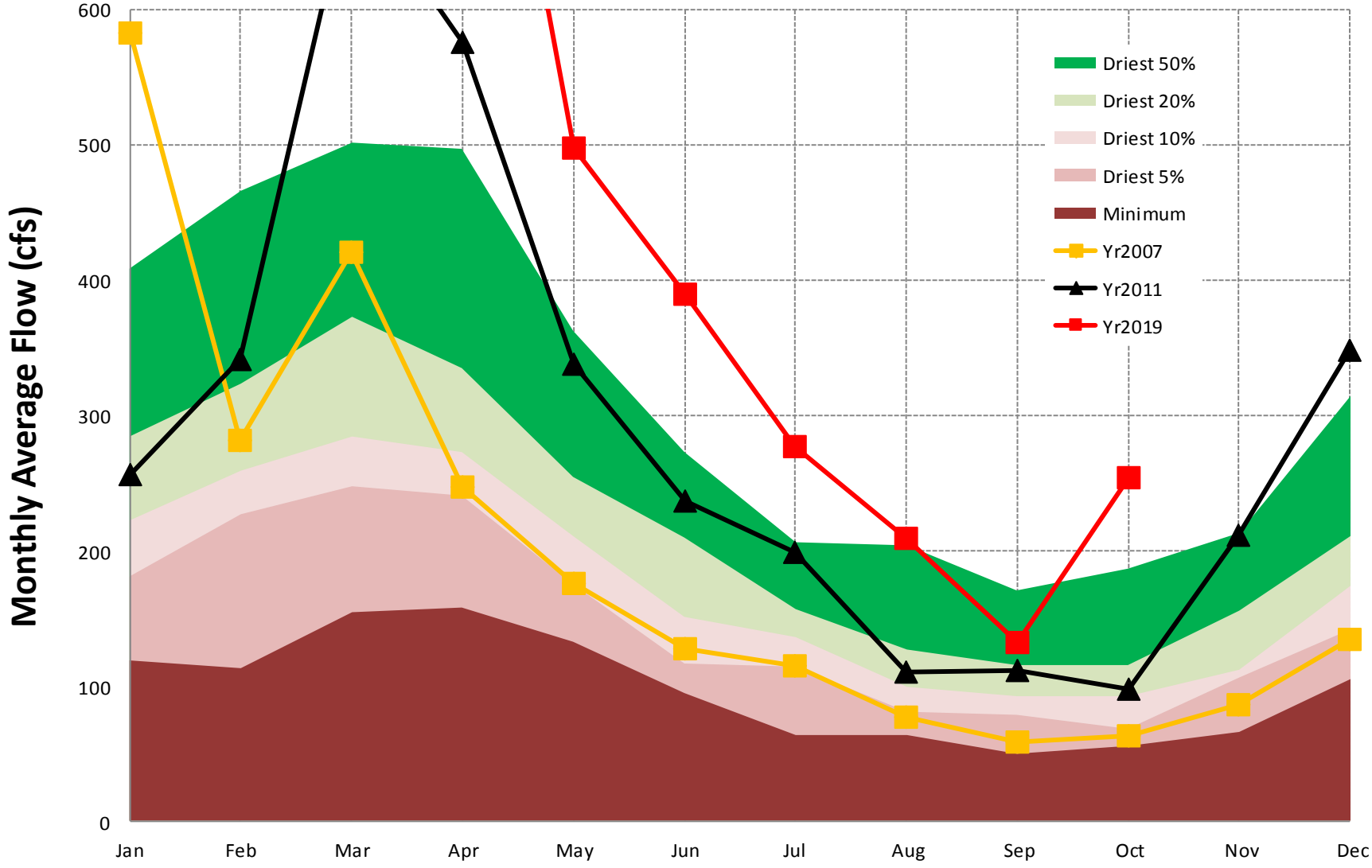
# Gage #7, USGS #02333500, Chatahoochee Basin, CHESTATEE RIVER NEAR DAHLONEGA, GA

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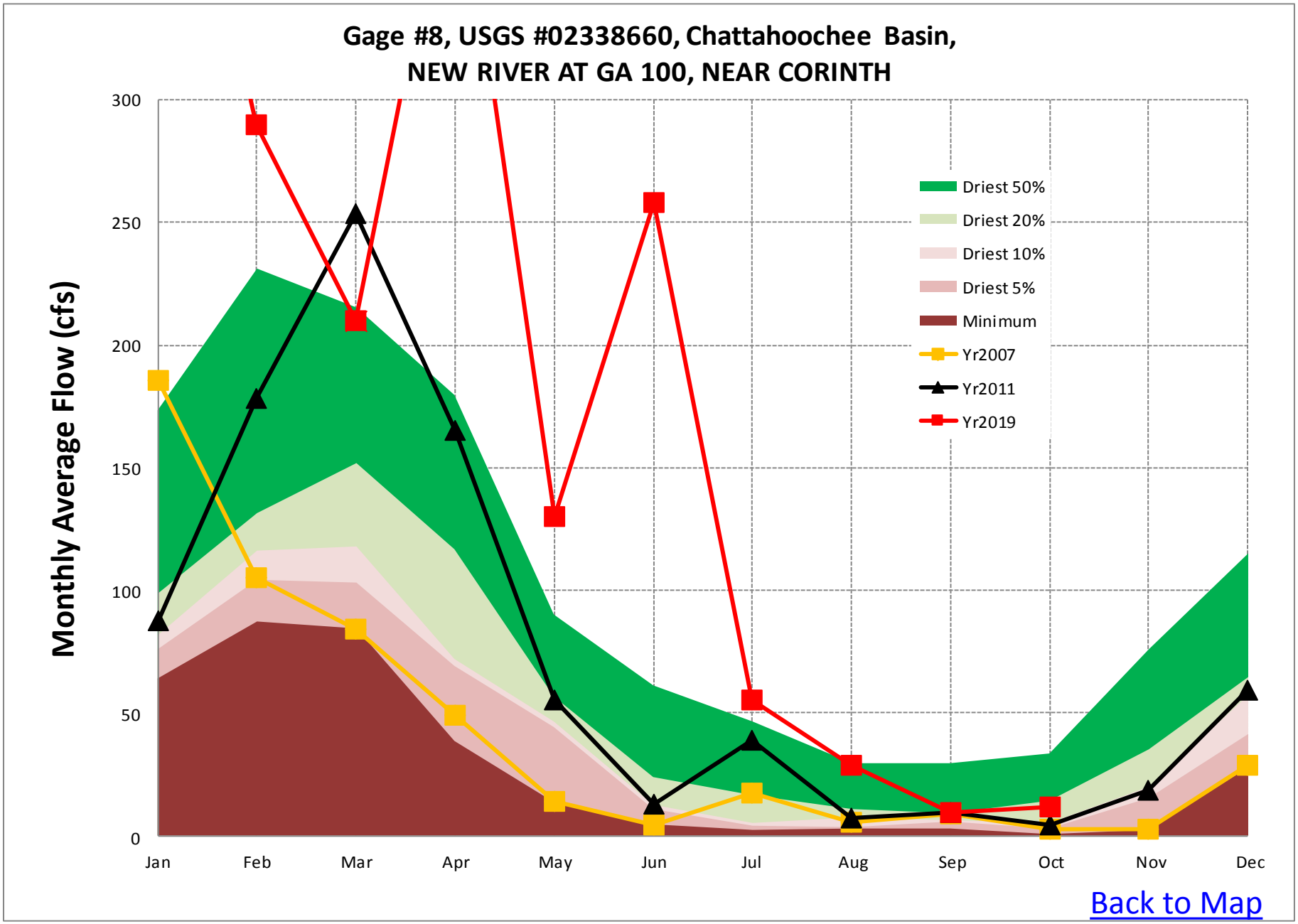
Gage #8, USGS #02338660, Chattahoochee Basin,
NEW RIVER AT GA 100, NEAR CORINTH
Monthly Average Flow (cfs)
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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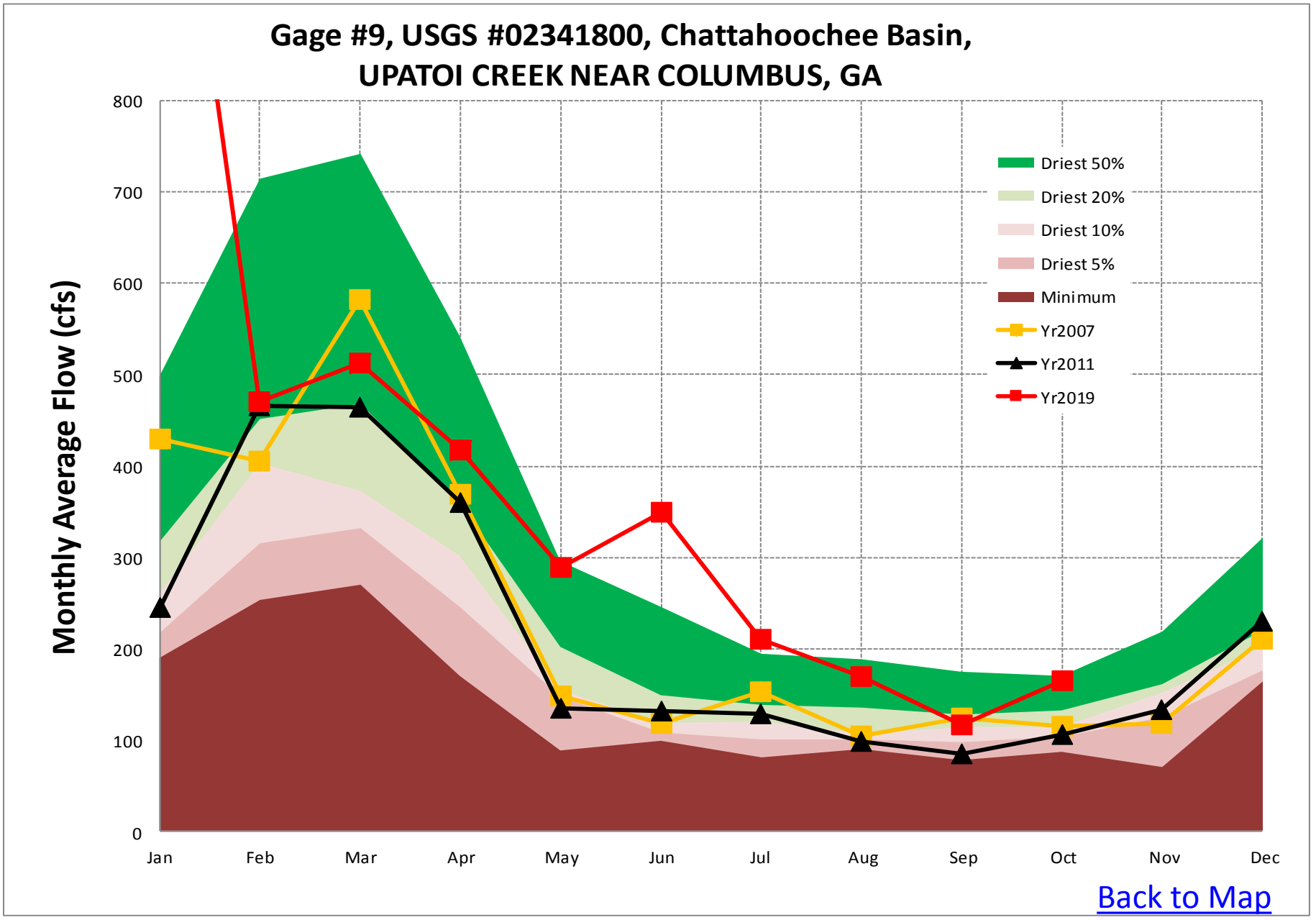
Gage #9, USGS #02341800, Chattahoochee Basin,
UPATOI CREEK NEAR COLUMBUS, GA
Monthly Average Flow (cfs)
800
700
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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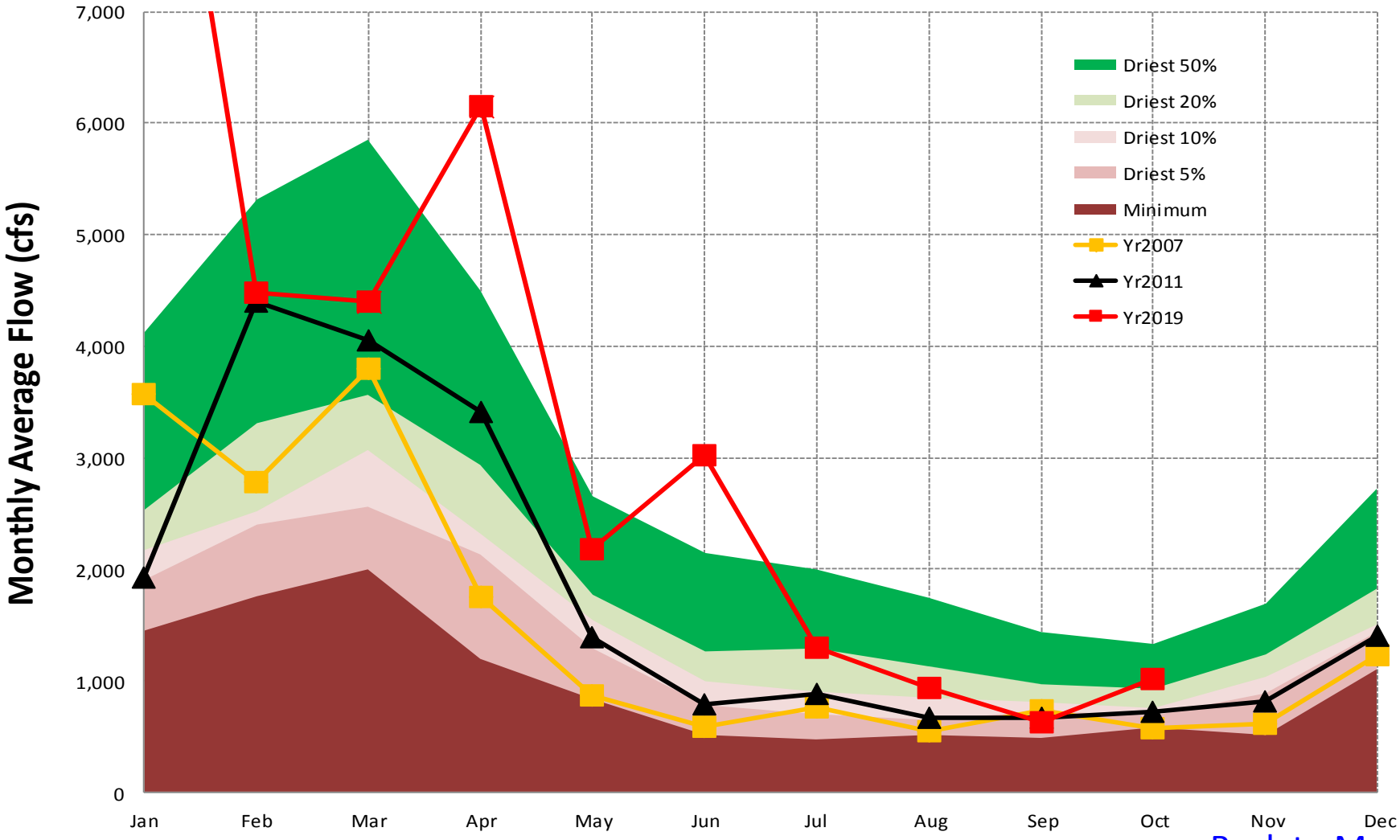
# Gage #10. USGS #02349605, Flint Basin,
# FLINT RIVER AT GA26 NEAR MONTEZUMA, GA

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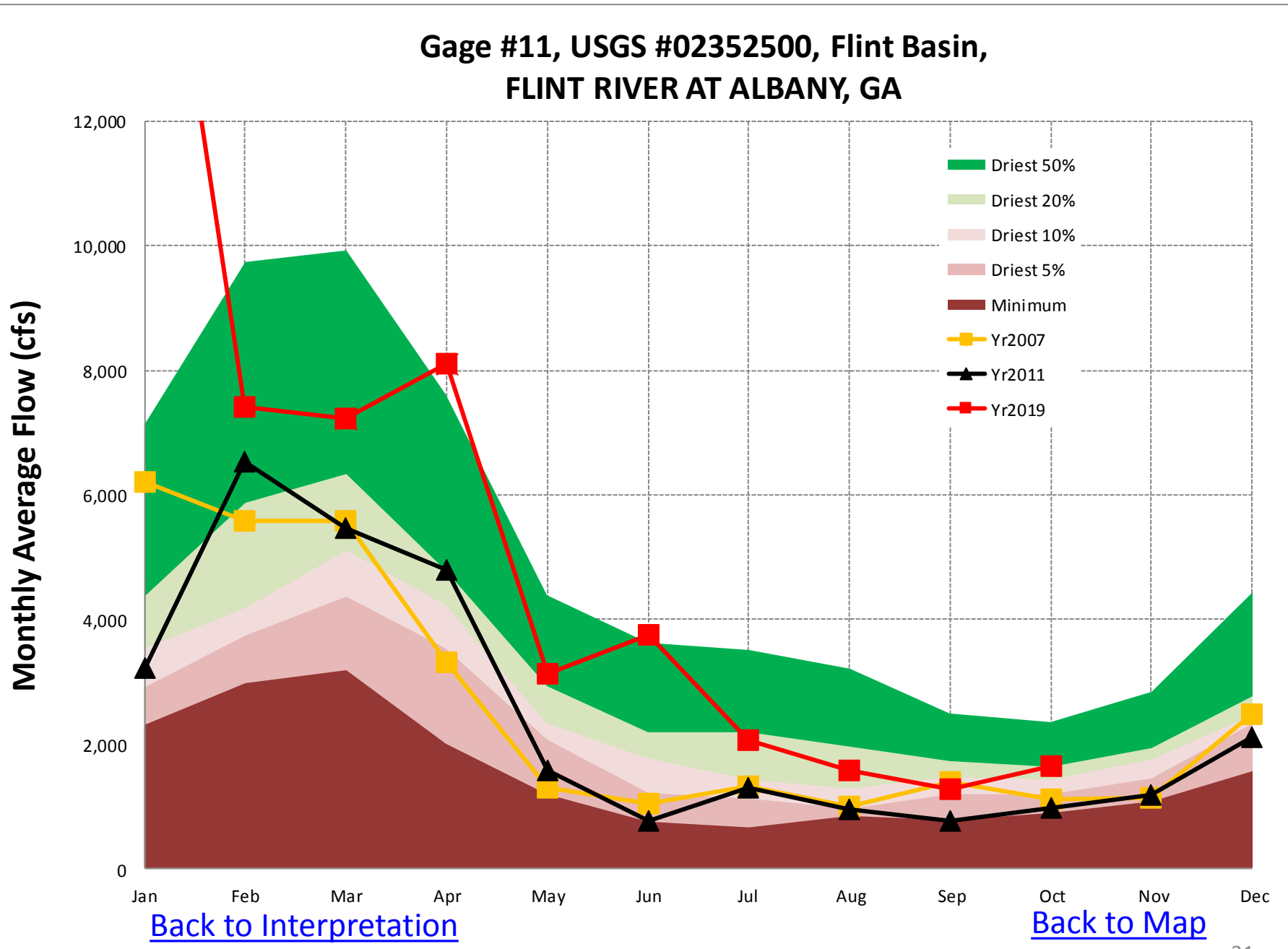


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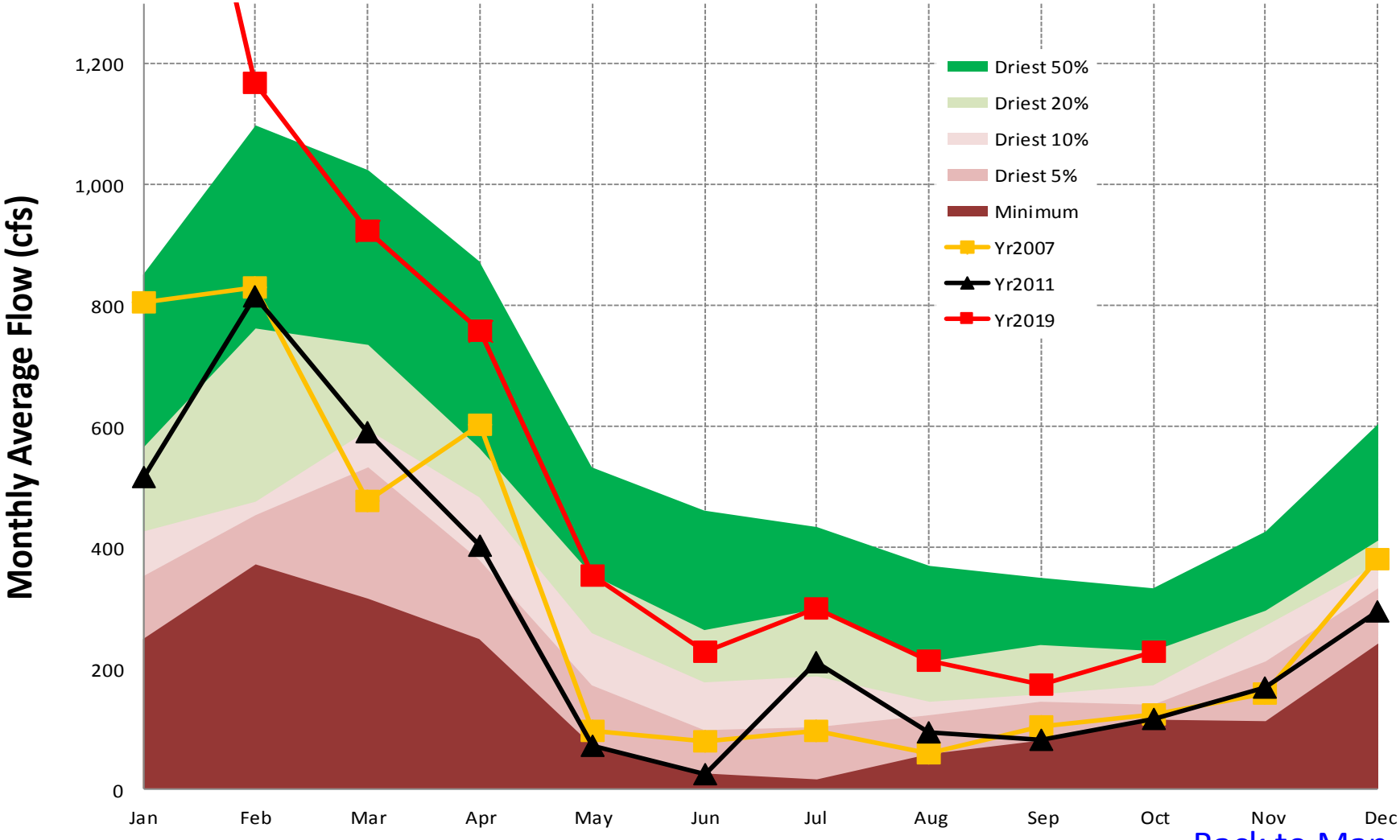
## Gage #12. USGS #02353500, Flint Basin, Ichawaynochaway Creek at Milford, GA

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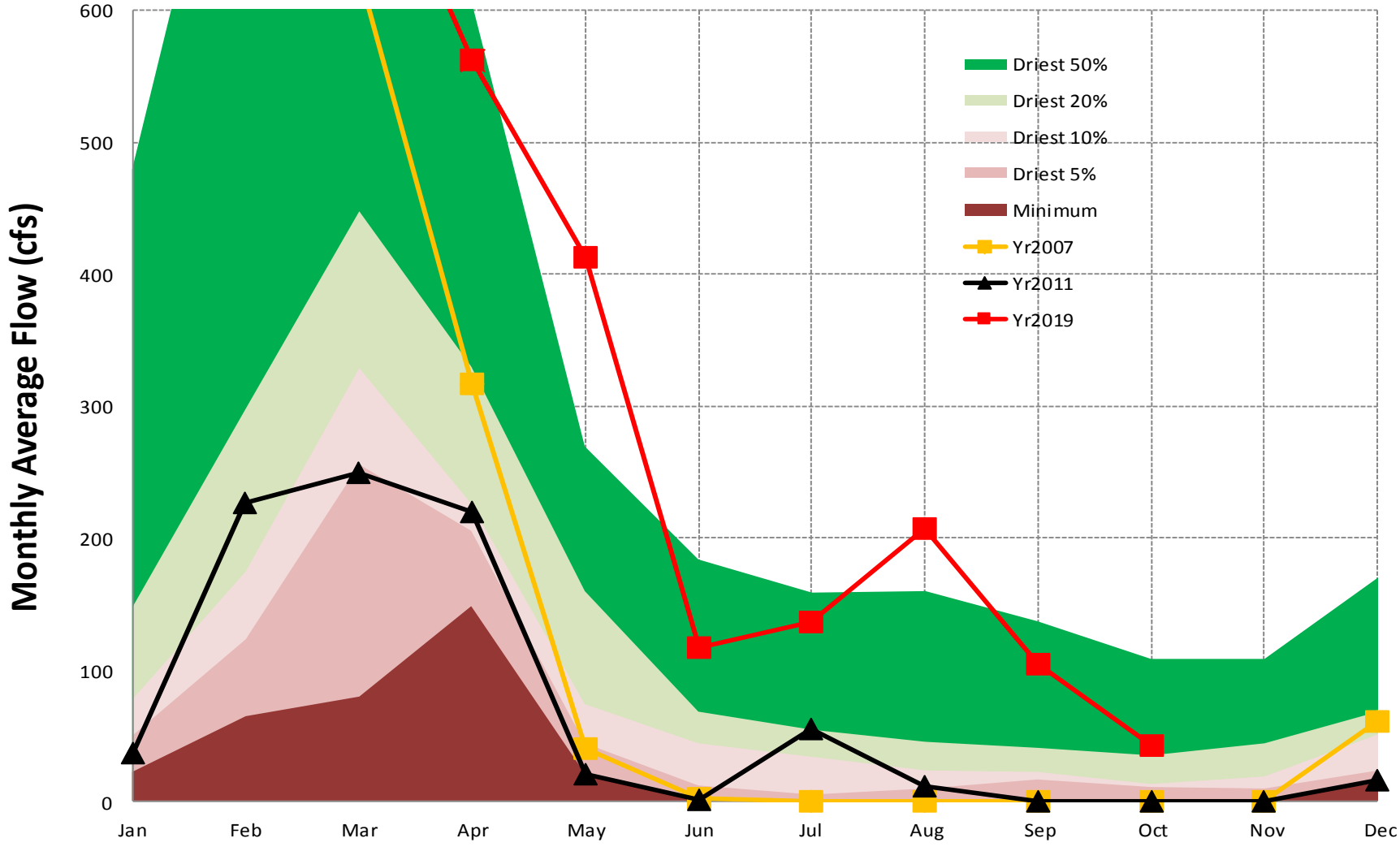
## Gage #13. USGS #02357000, Flint River, Spring Creek near Iron City, GA

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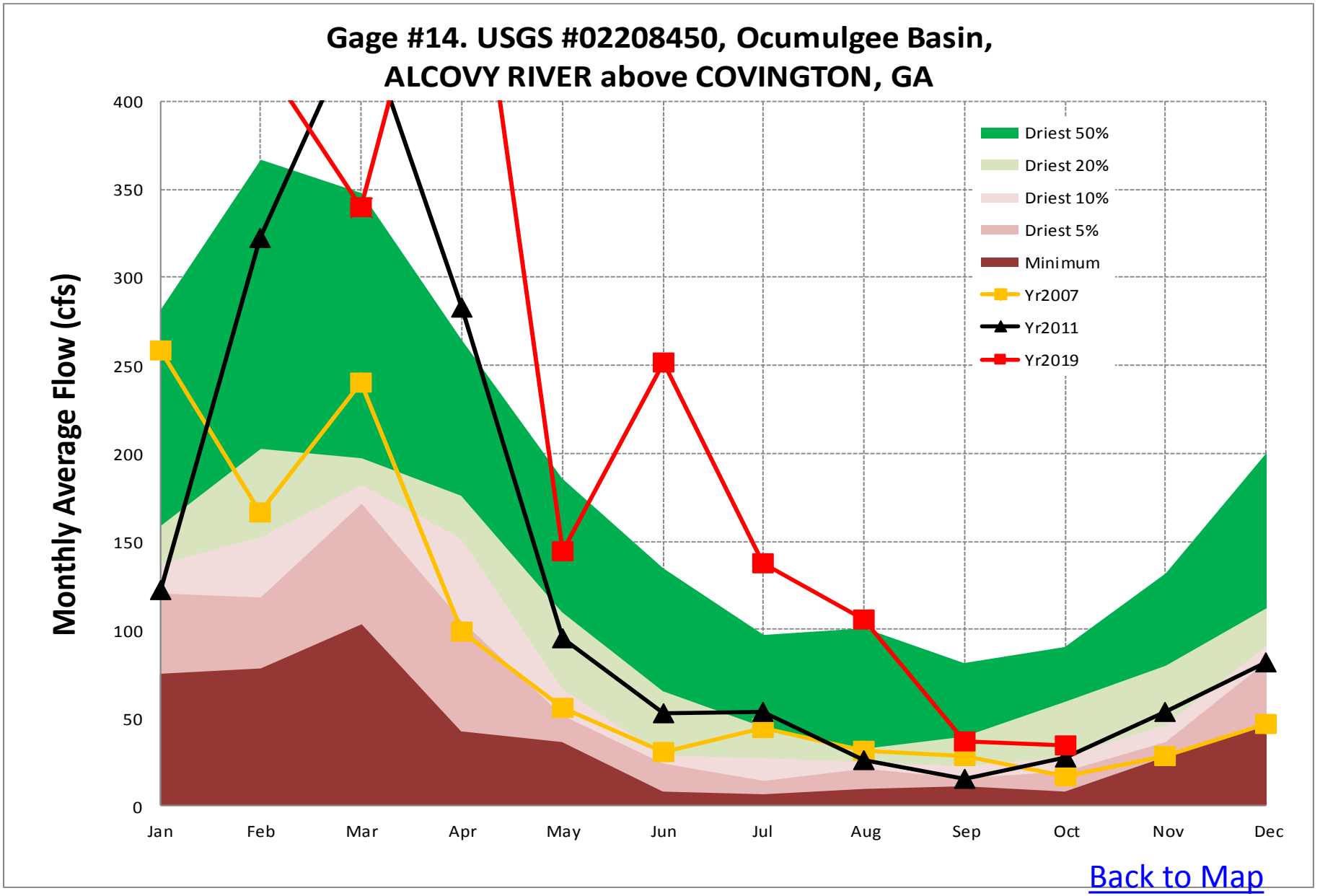
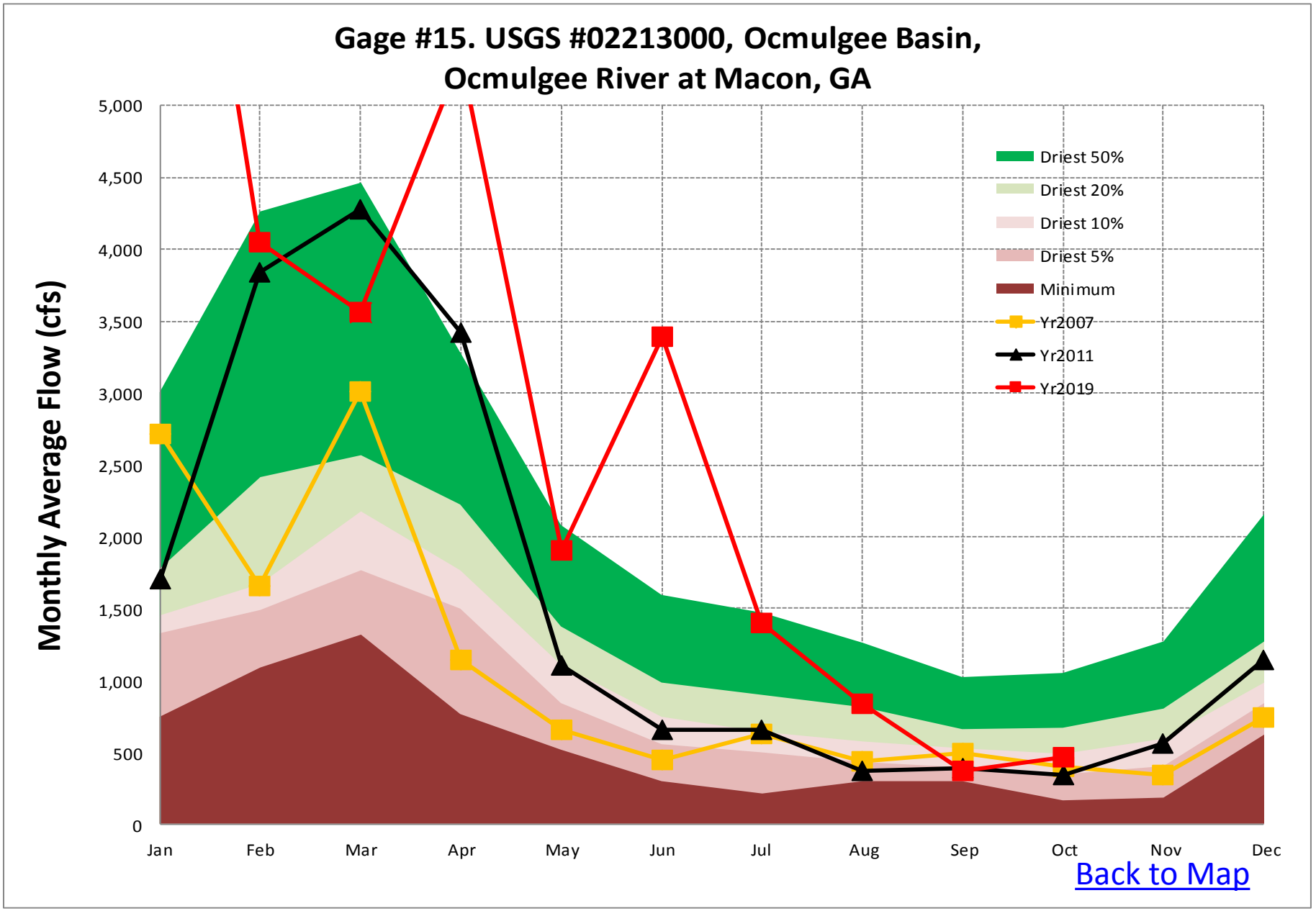

Gage #14. USGS #02208450, Ocumulgee Basin,
ALCOVY RIVER above COVINGTON, GA
Monthly Average Flow (cfs)
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

Back to Map


Gage #15. USGS #02213000, Ocmulgee Basin,
Ocmulgee River at Macon, 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
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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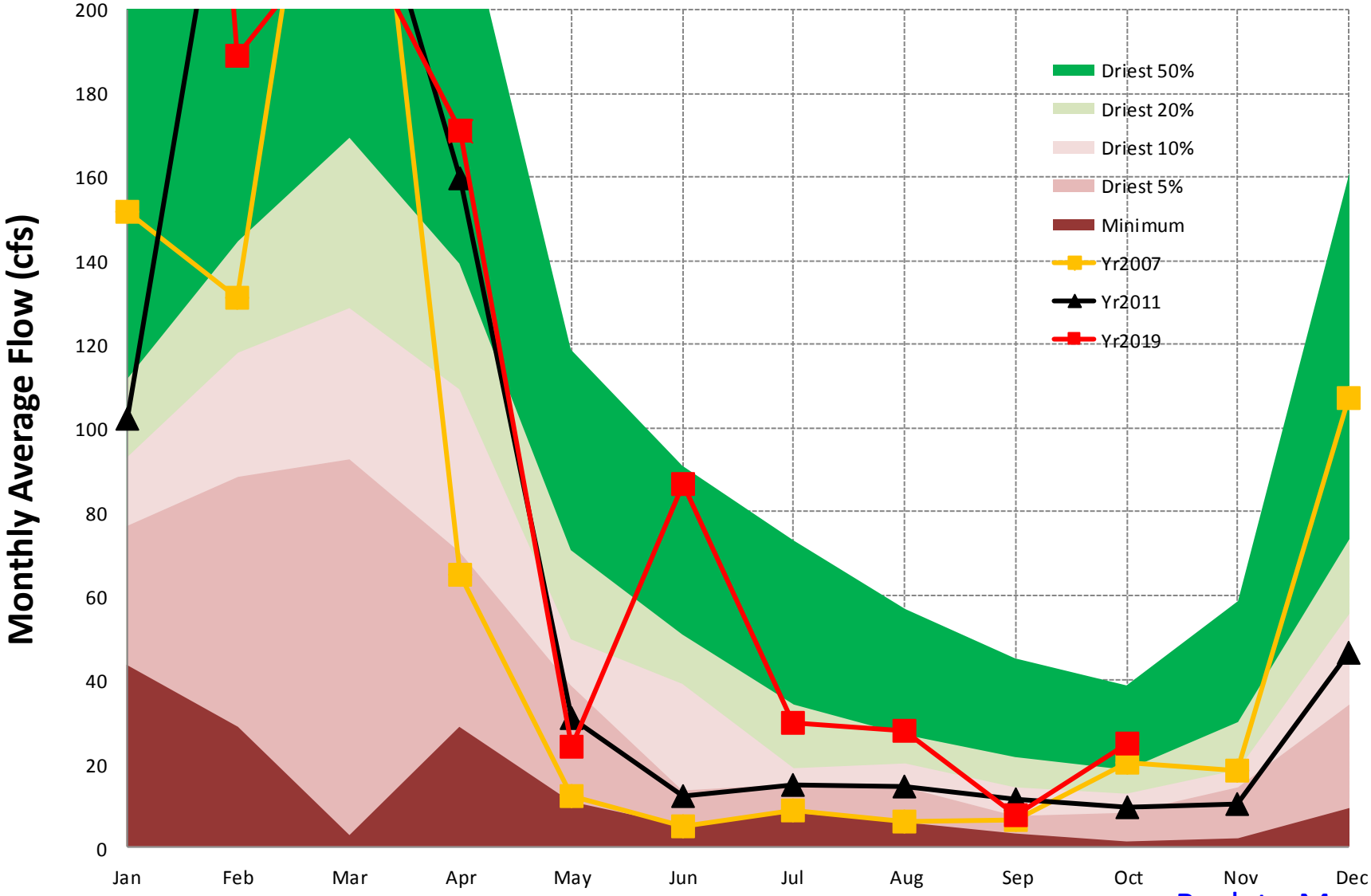
# Gage #16. USGS #02213500, Ocmulgee Basin, TOBESOFKEE CREEK near MACON, GA

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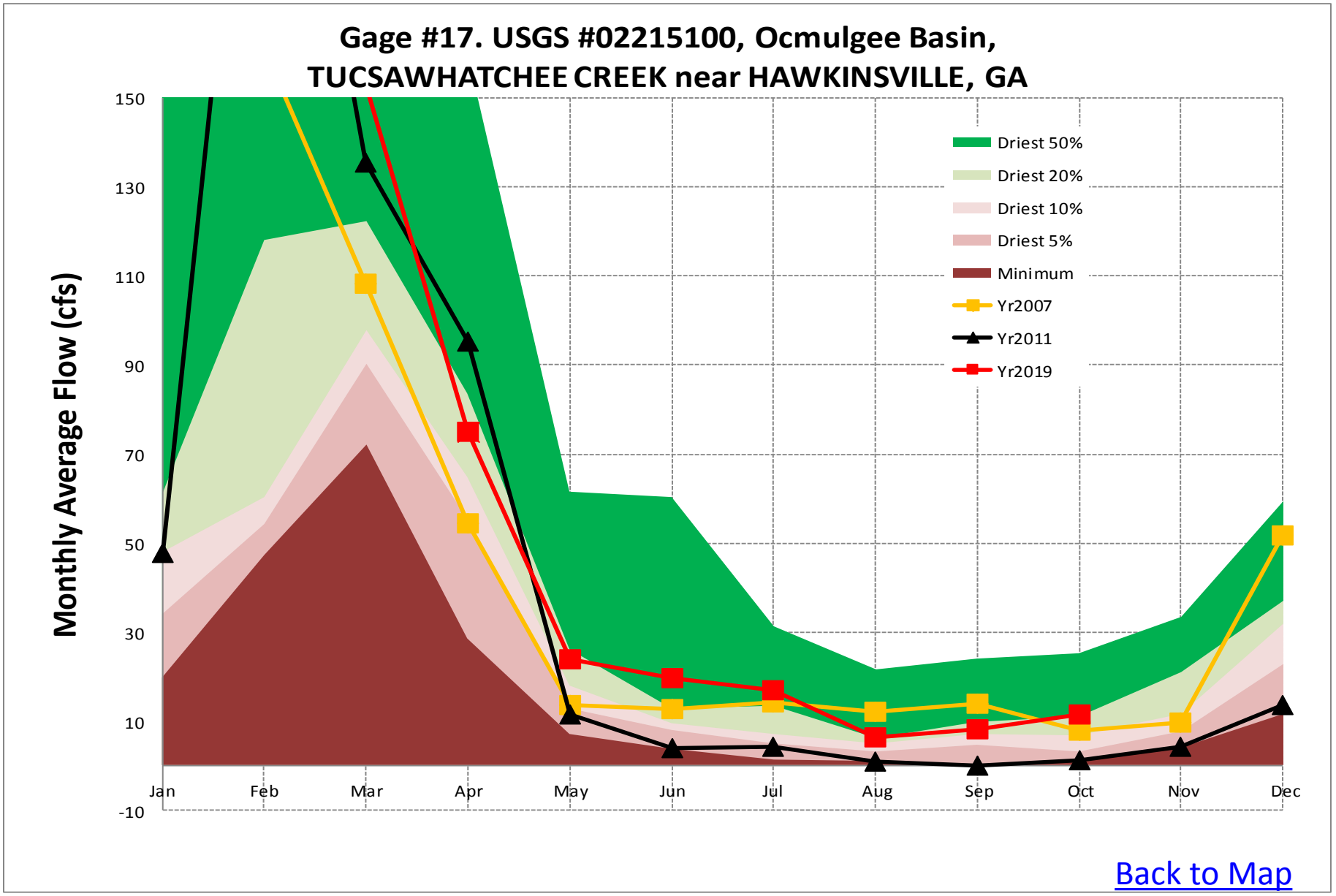
Gage #17. USGS #02215100, Ocmulgee Basin,
TUCSAWHATCHEE CREEK near HAWKINSVILLE, GA
Monthly Average Flow (cfs)
150
130
110
90
70
50
30
10
-10
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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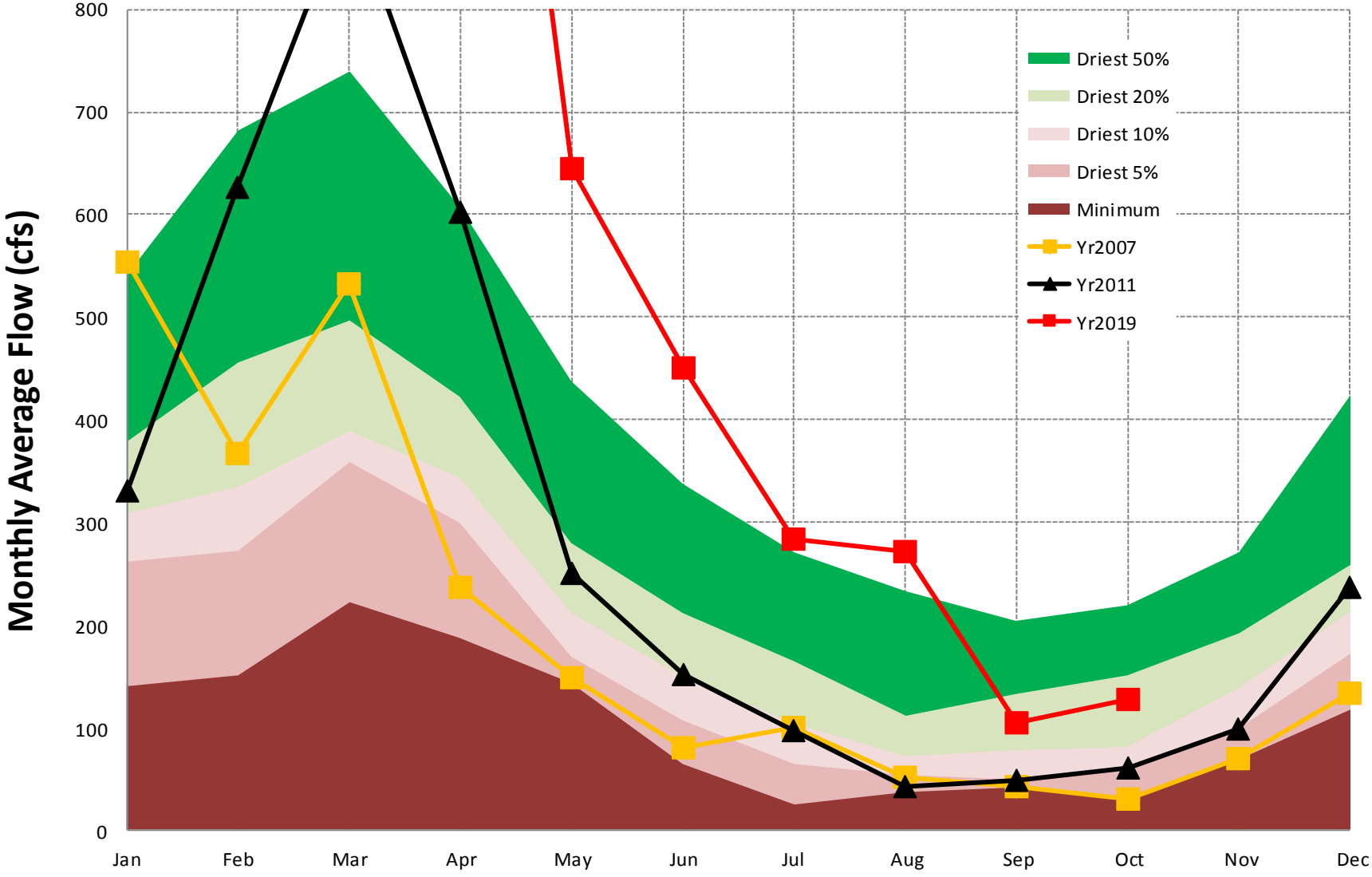
# Gage #18. USGS #02217500, Oconee Basin, MIDDLE OCONEE RIVER near ATHENS, GA

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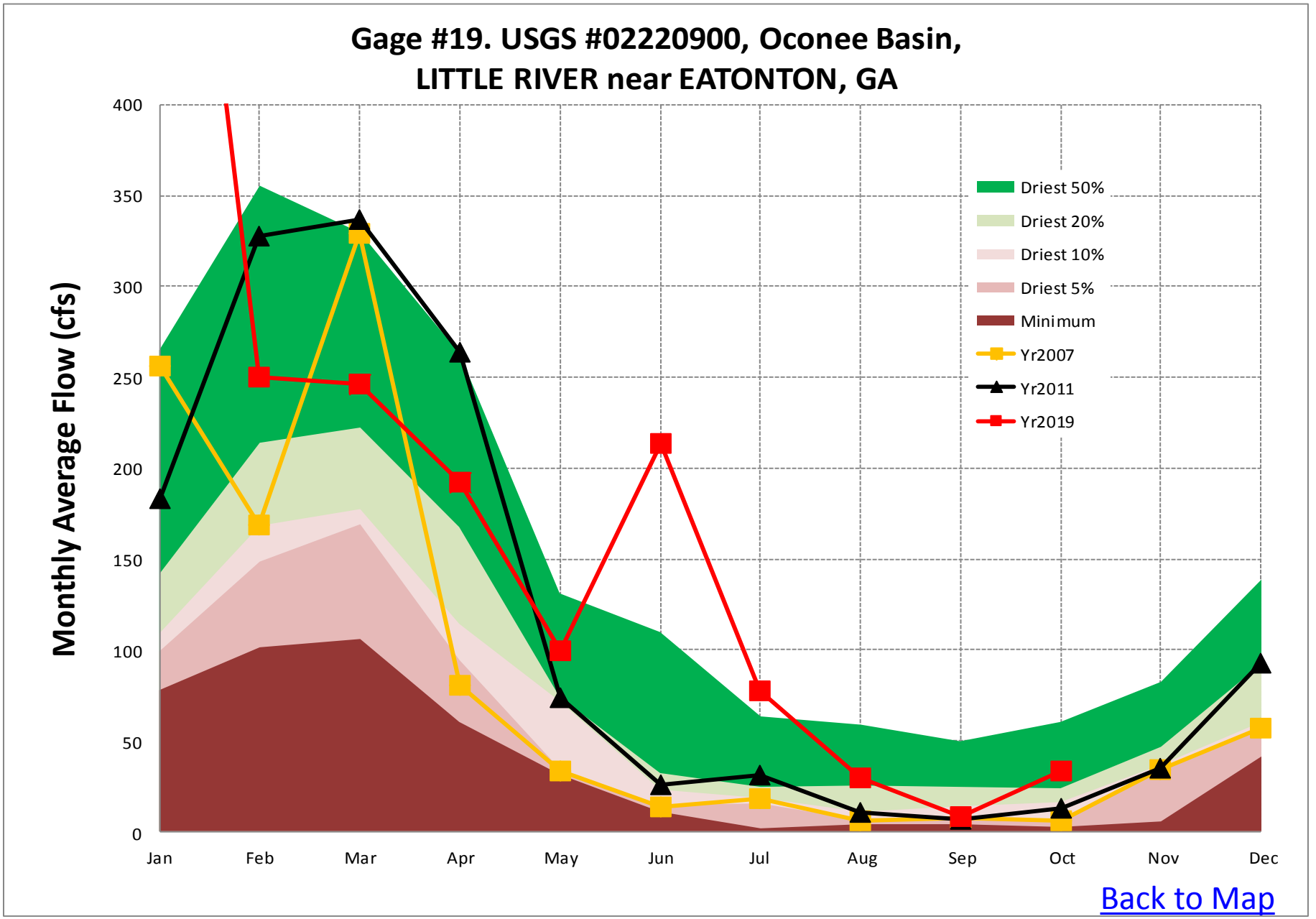
Gage #19. USGS #02220900, Oconee Basin,
LITTLE RIVER near EATONTON, GA
Monthly Average Flow (cfs)
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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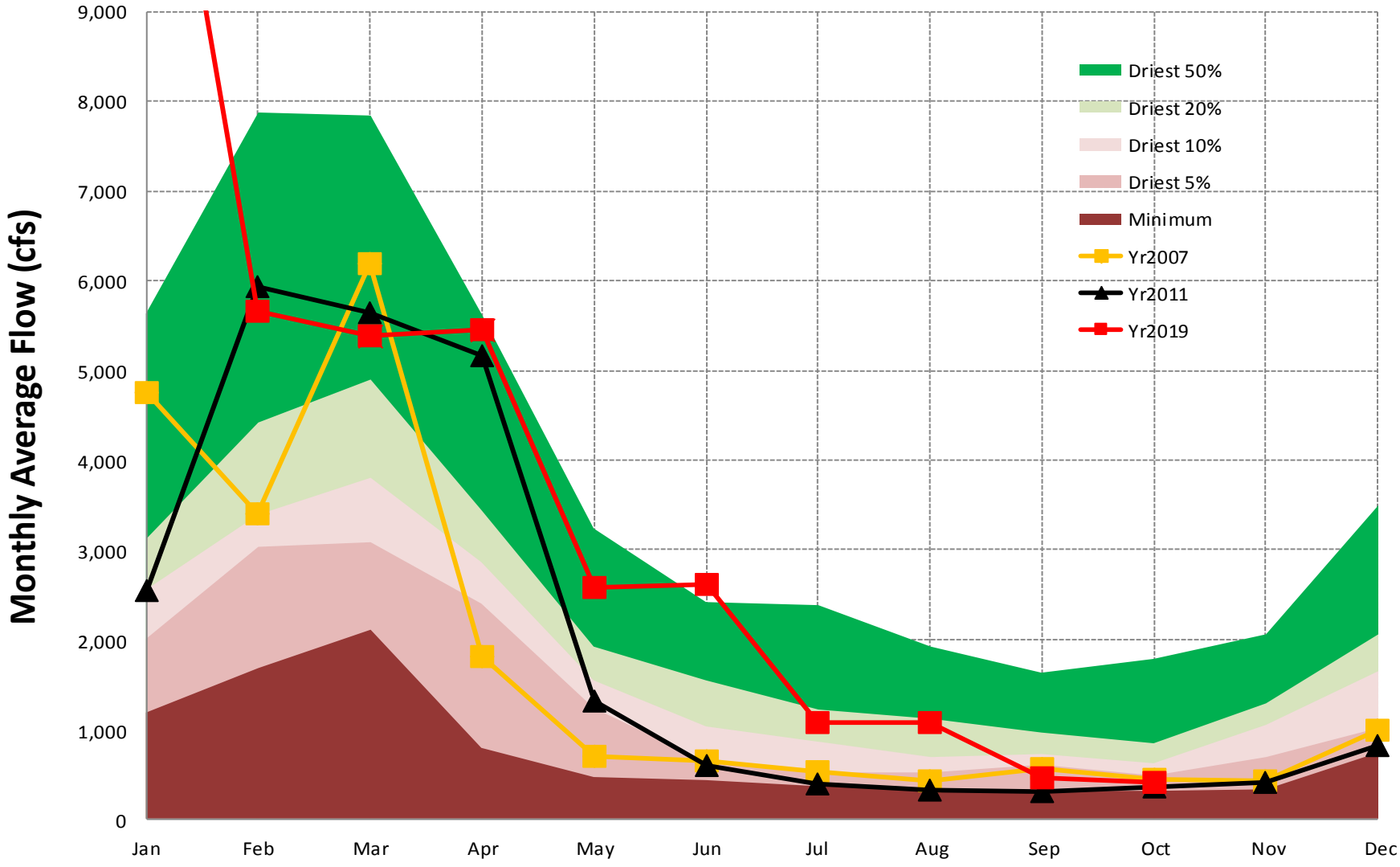
# Gage #20. USGS #02223500, Oconee Basin, Oconee River at Dublin, GA

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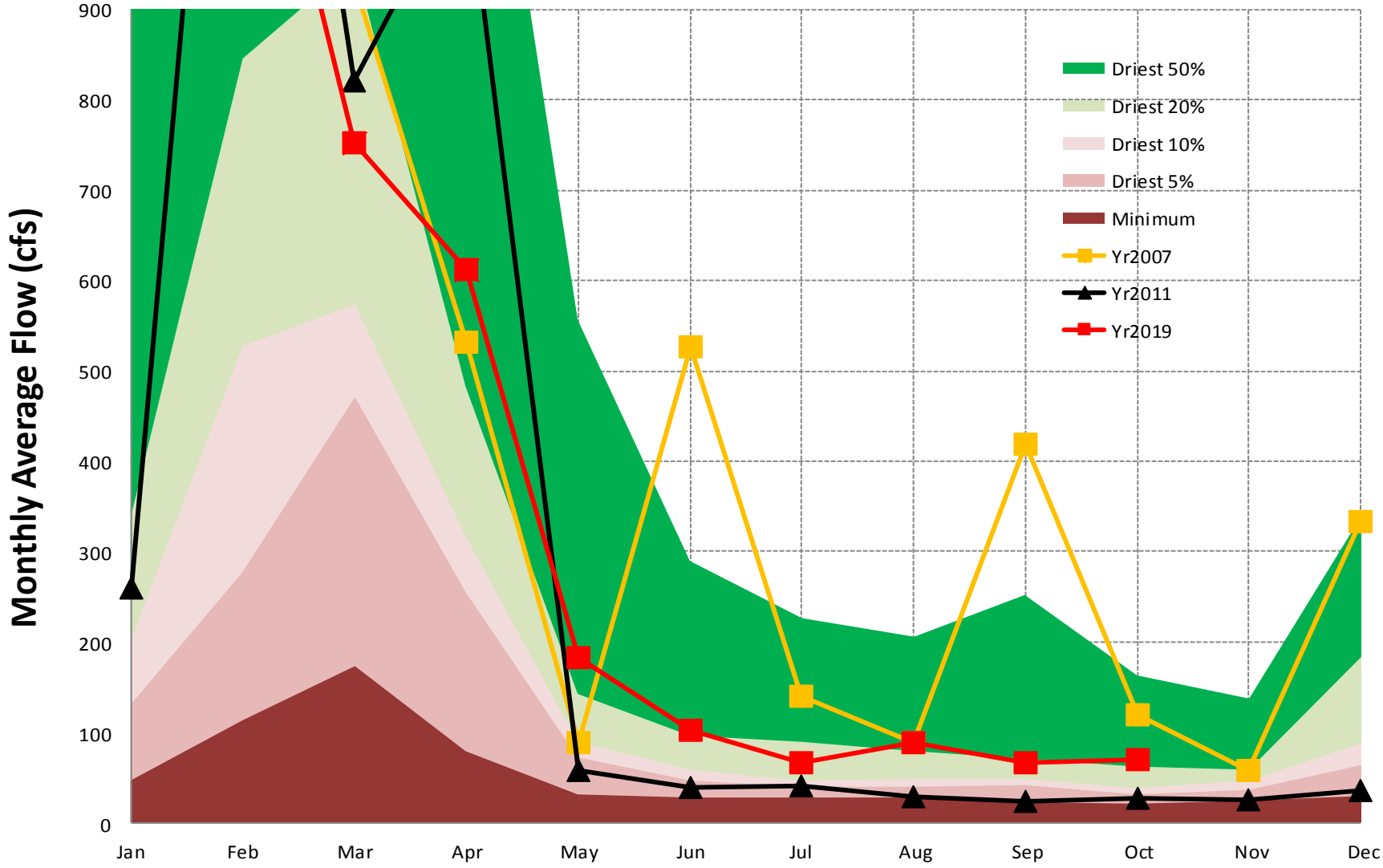
# Gage #21. USGS #02225500, Altamaha Basin, OHOOPEE RIVER near REIDSVILLE, GA

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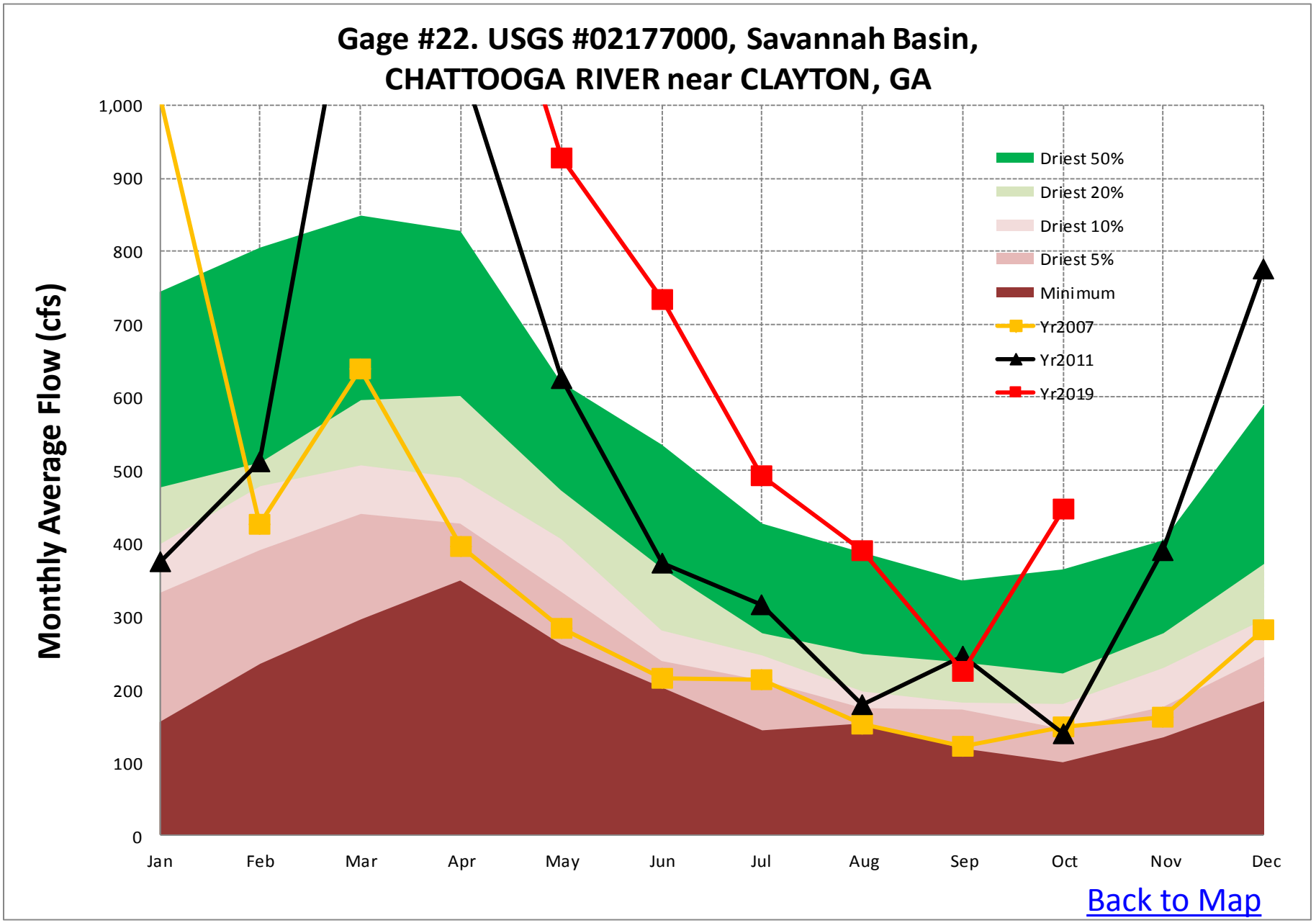
Gage #22. USGS #02177000, Savannah Basin,
CHATTOOGA RIVER near CLAYTON, GA
Monthly Average Flow (cfs)
1,000
900
800
700
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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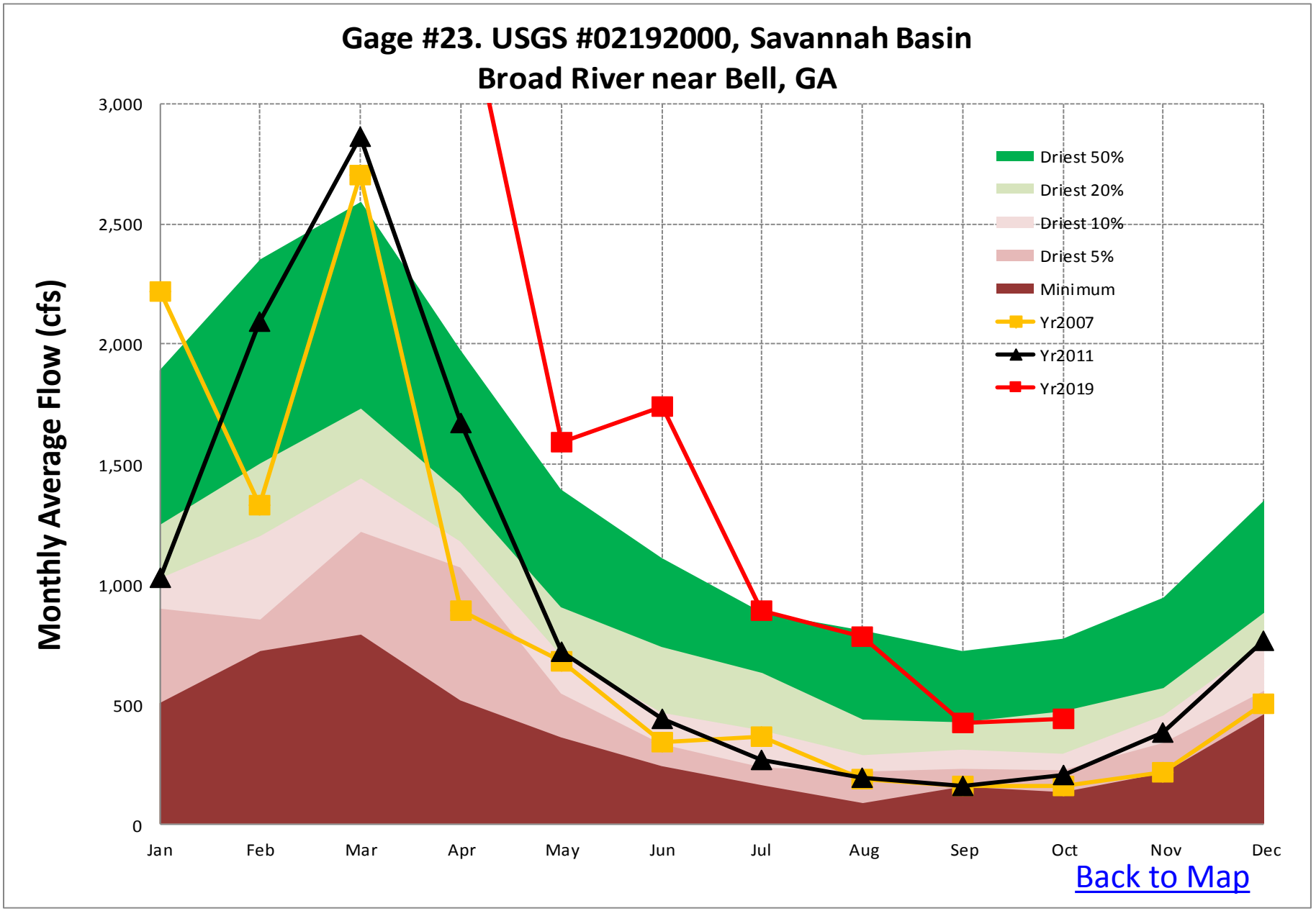
Gage #23. USGS #02192000, Savannah Basin
Broad River near Bell, GA
Monthly Average Flow (cfs)
3,000
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2019

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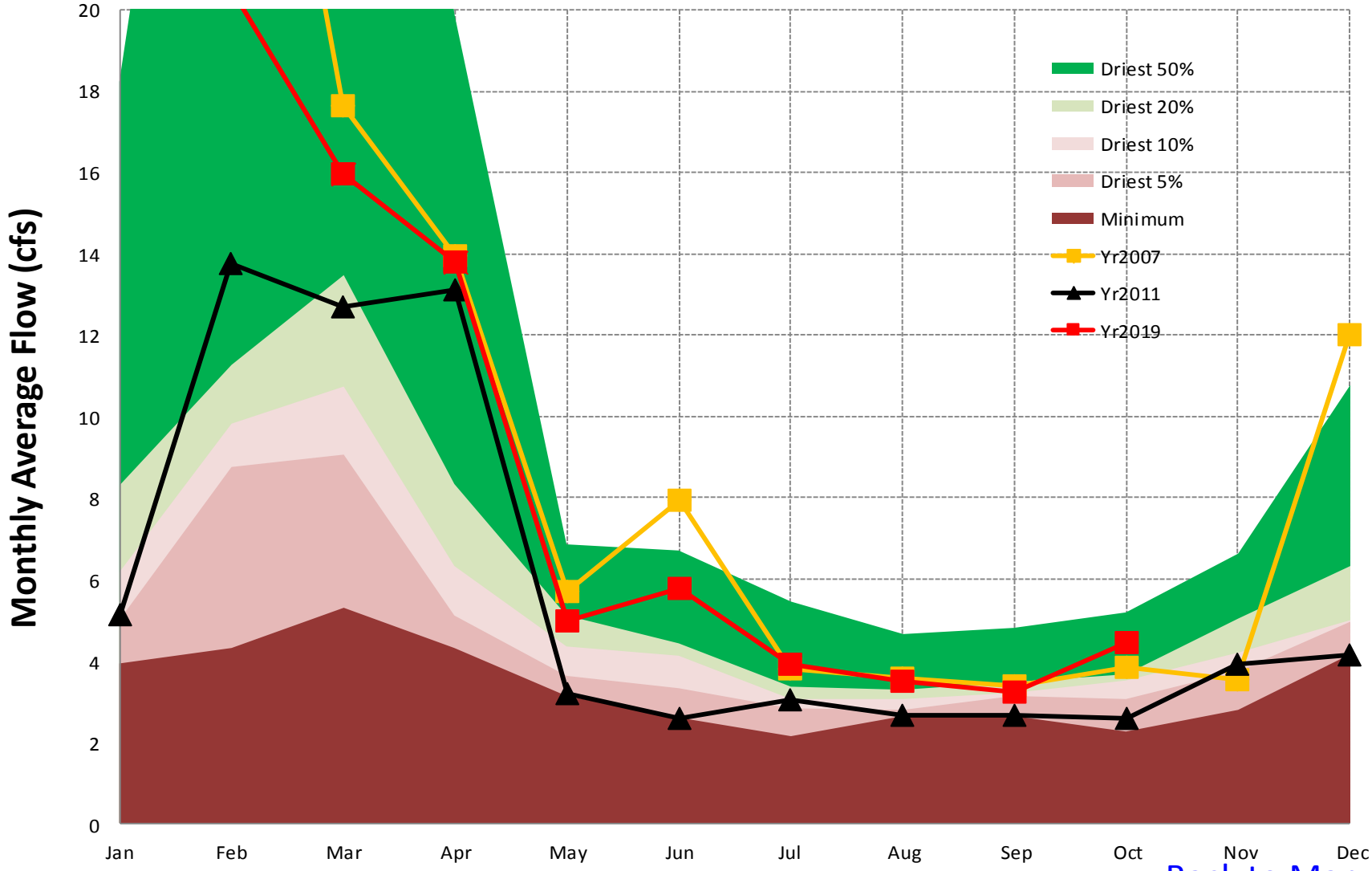
## Gage #24. USGS #02198100, Savannah Basin, BEAVERDAM CREEK near SARDIS, GA

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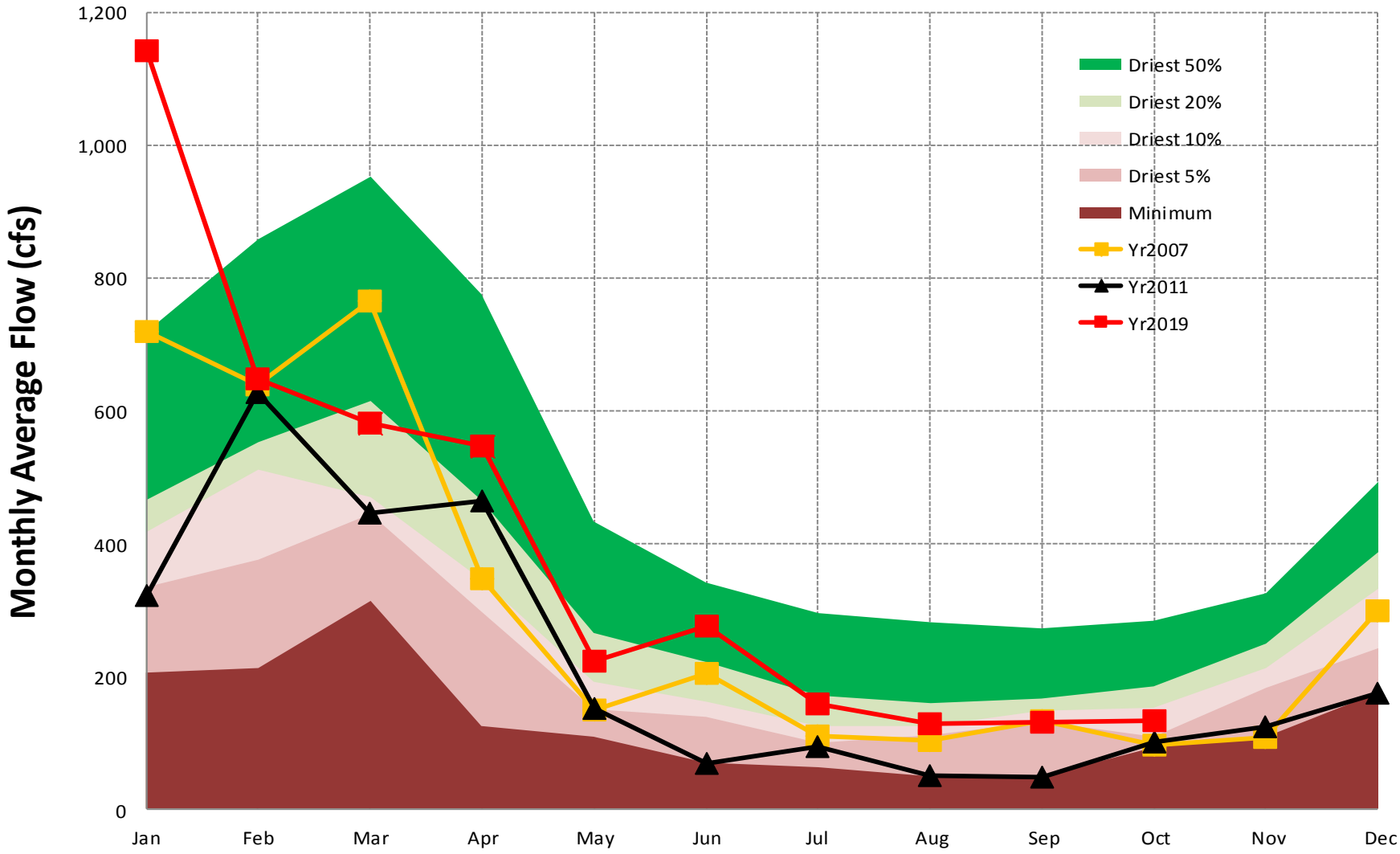
# Gage #25. USGS #02198000, Savannah Basin, BRIER CREEK at MILLHAVEN, GA

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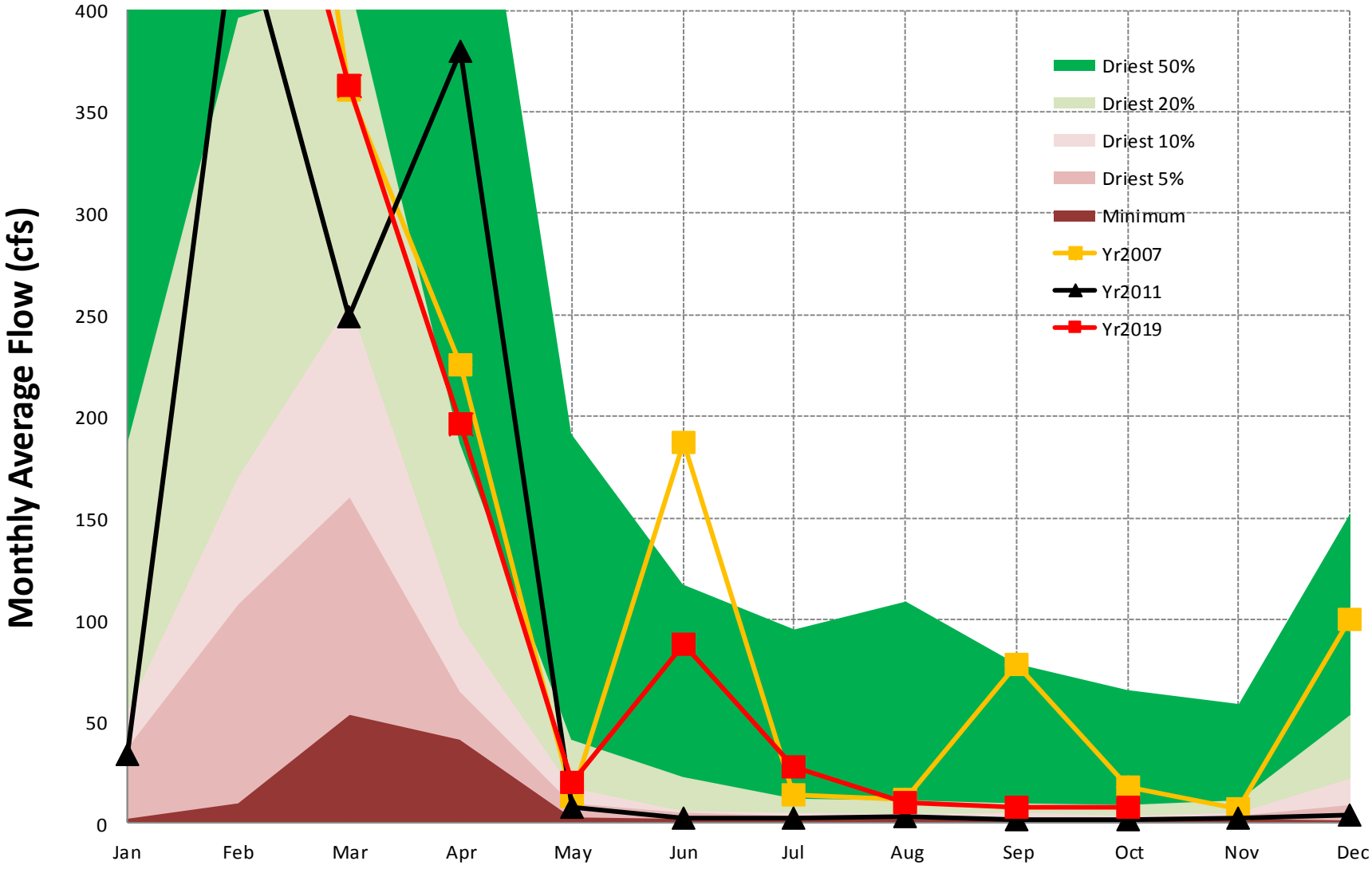
# Gage #26. USGS #02203000, Ogeechee Basin, CANOOCHEE RIVER near CLAXTON, GA

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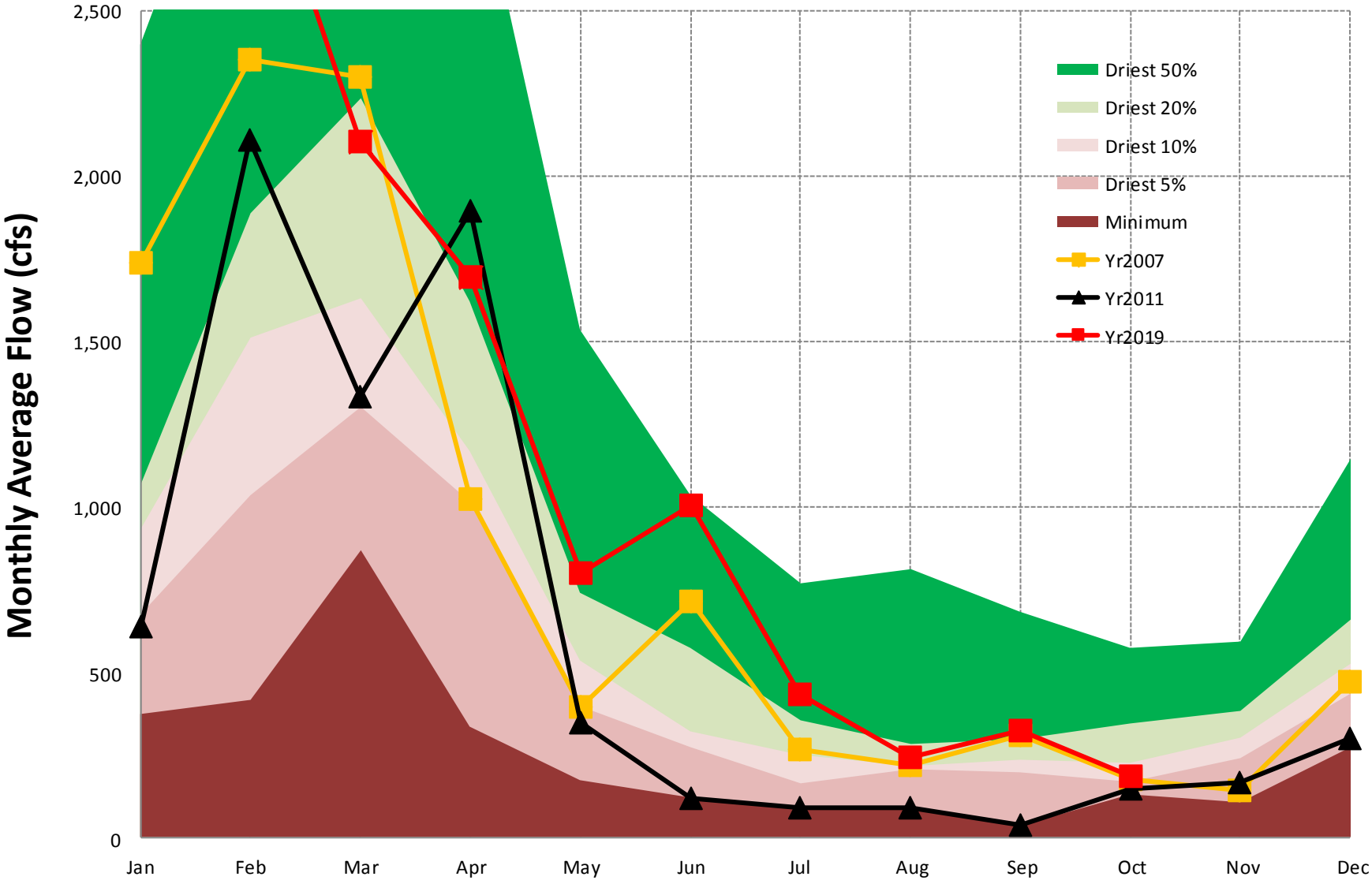
# Gage #27. USGS #02202500, Ogeechee Basin, Ogeechee River near Eden, GA

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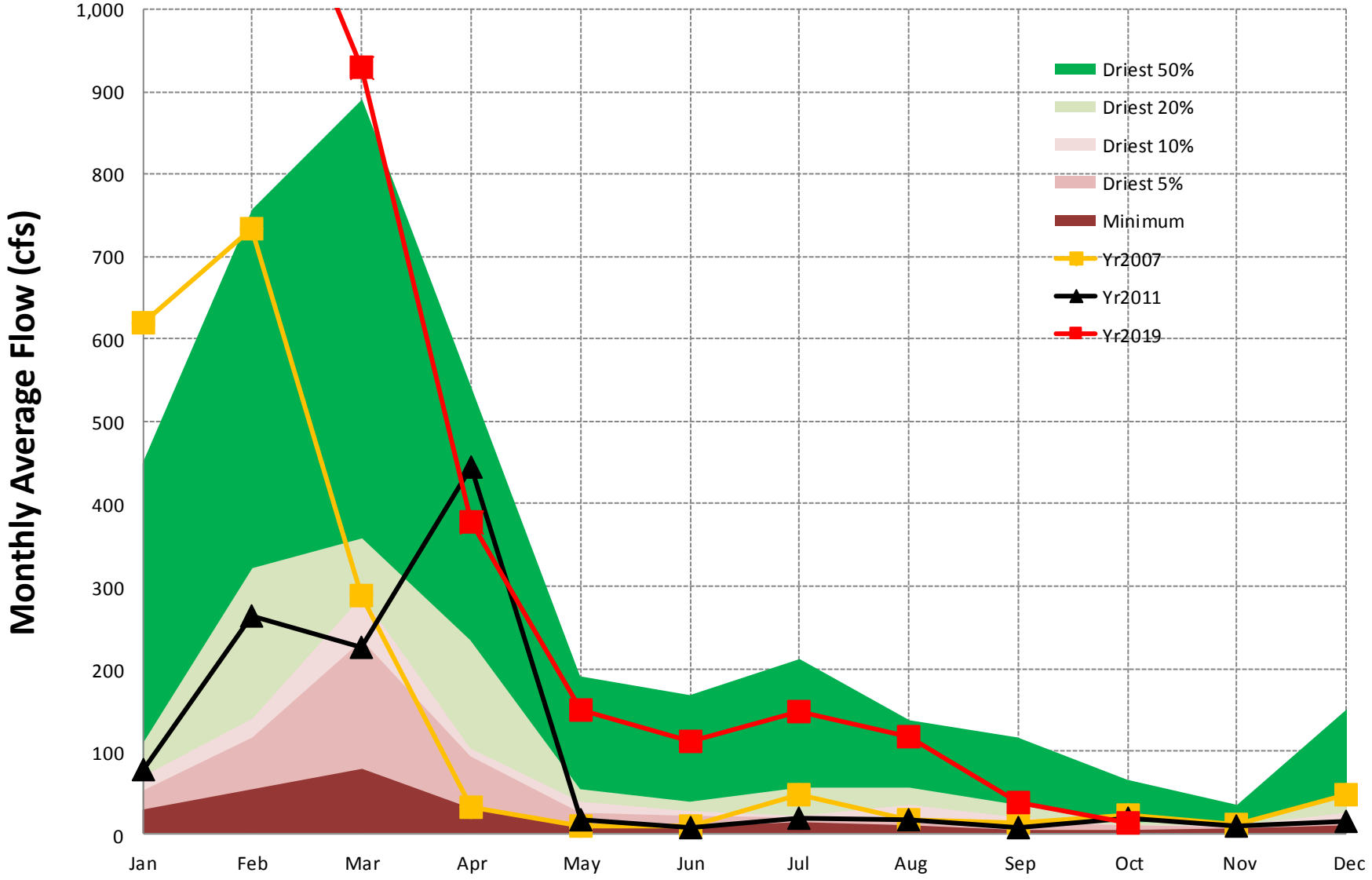
# Gage #28. USGS #02327500, Ochlockonee Basin, OCHLOCKONEE RIVER near THOMASVILLE, GA

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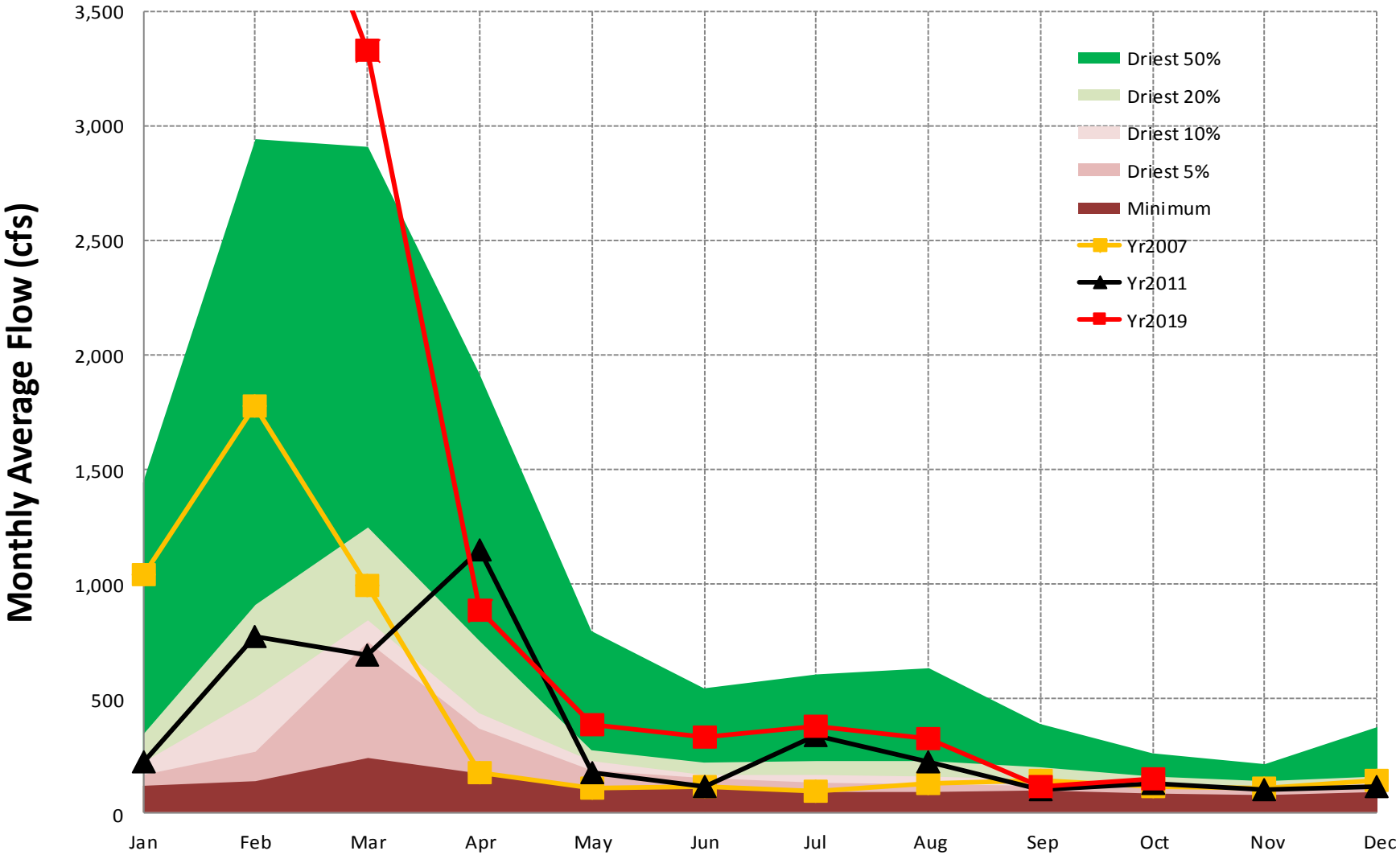
# Gage #29. USGS #02319000, Suwanee Basin, WITHLACOOCHEE RIVER near PINETTA, FL

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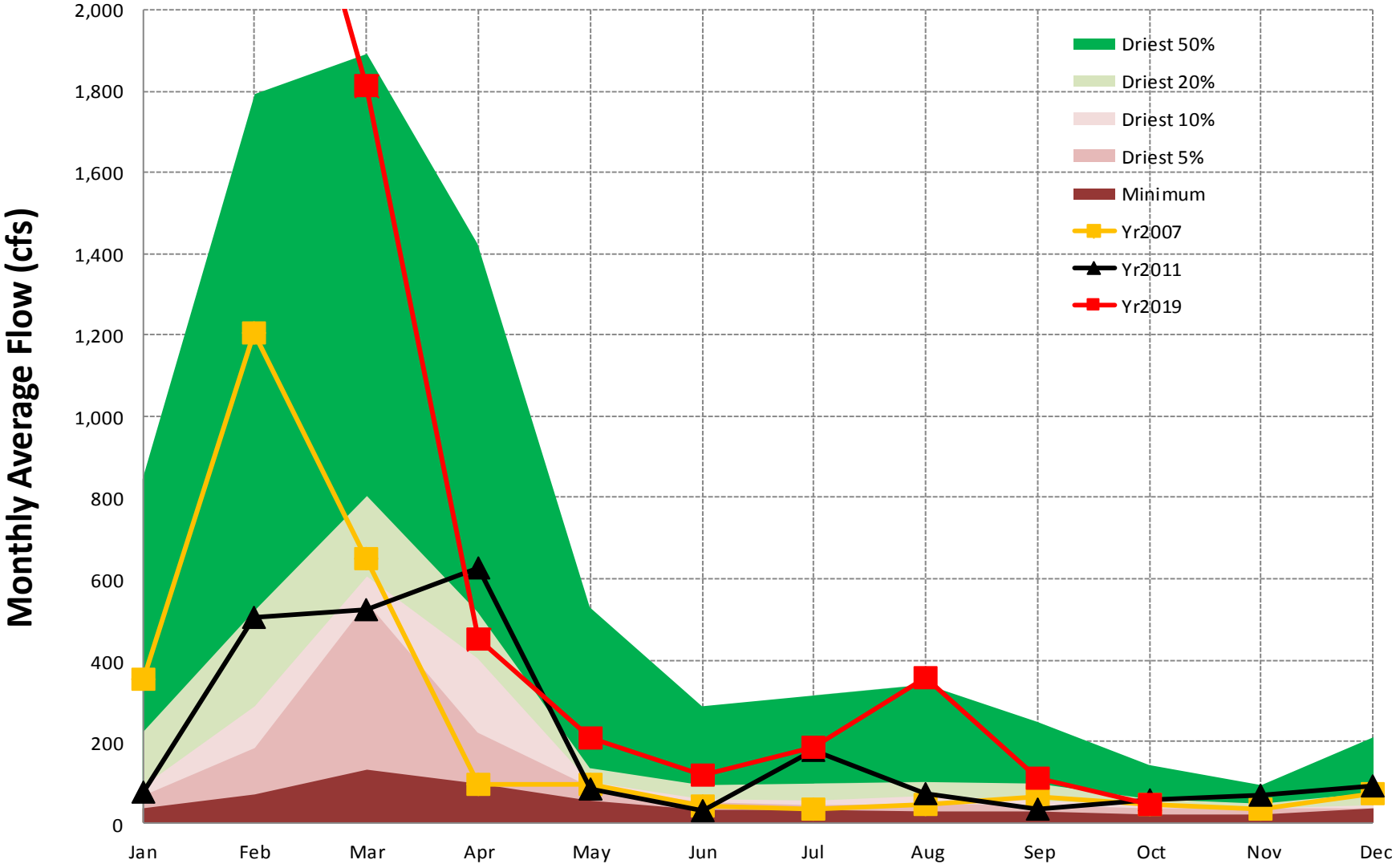
# Gage #30. USGS #02317500, Suwanee Basin, Alapaha River at Statenville, GA

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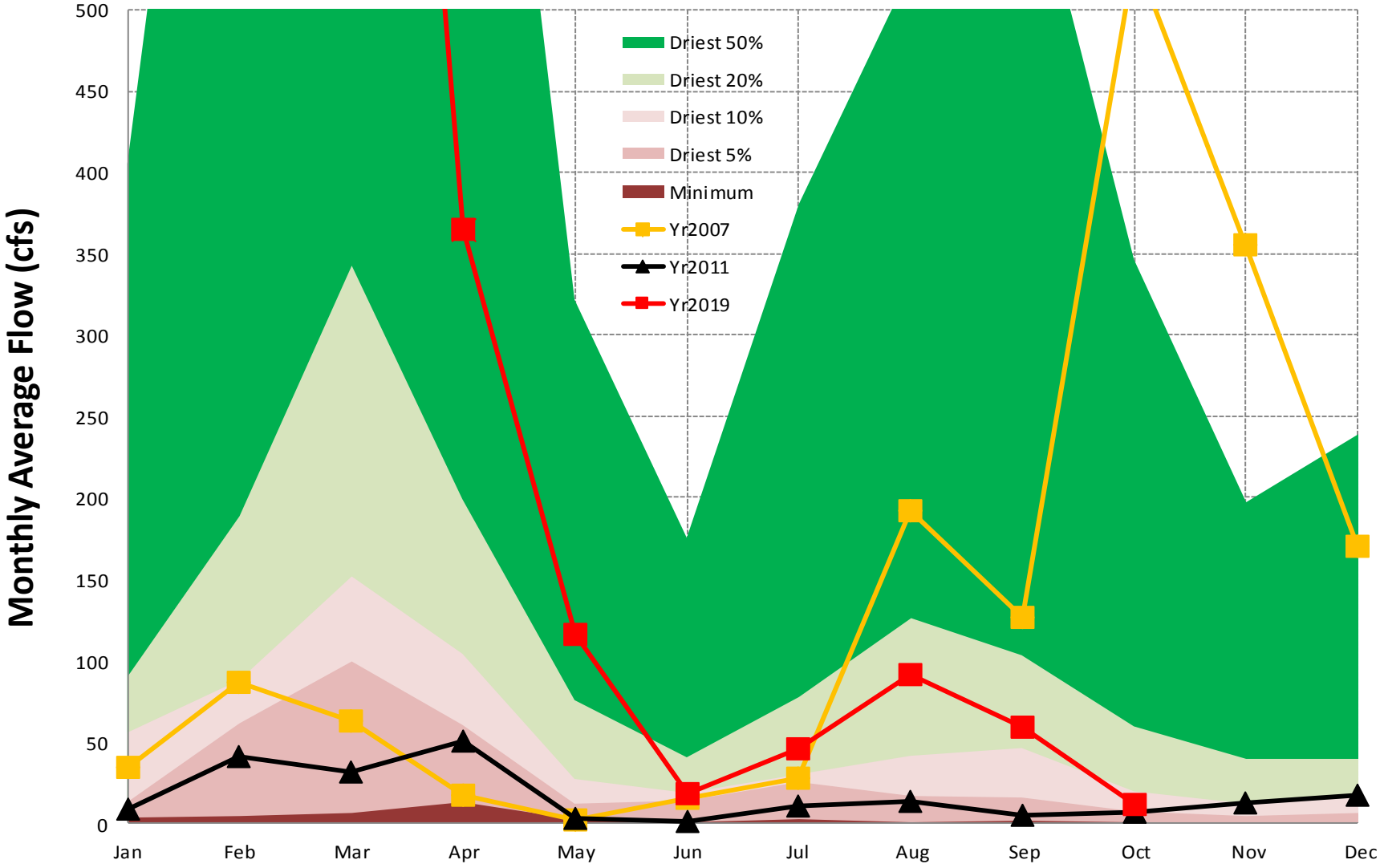
# Gage #31. USGS #02314500, Suwanee Basin, SUWANNEE RIVER AT US 441, AT FARGO, GA

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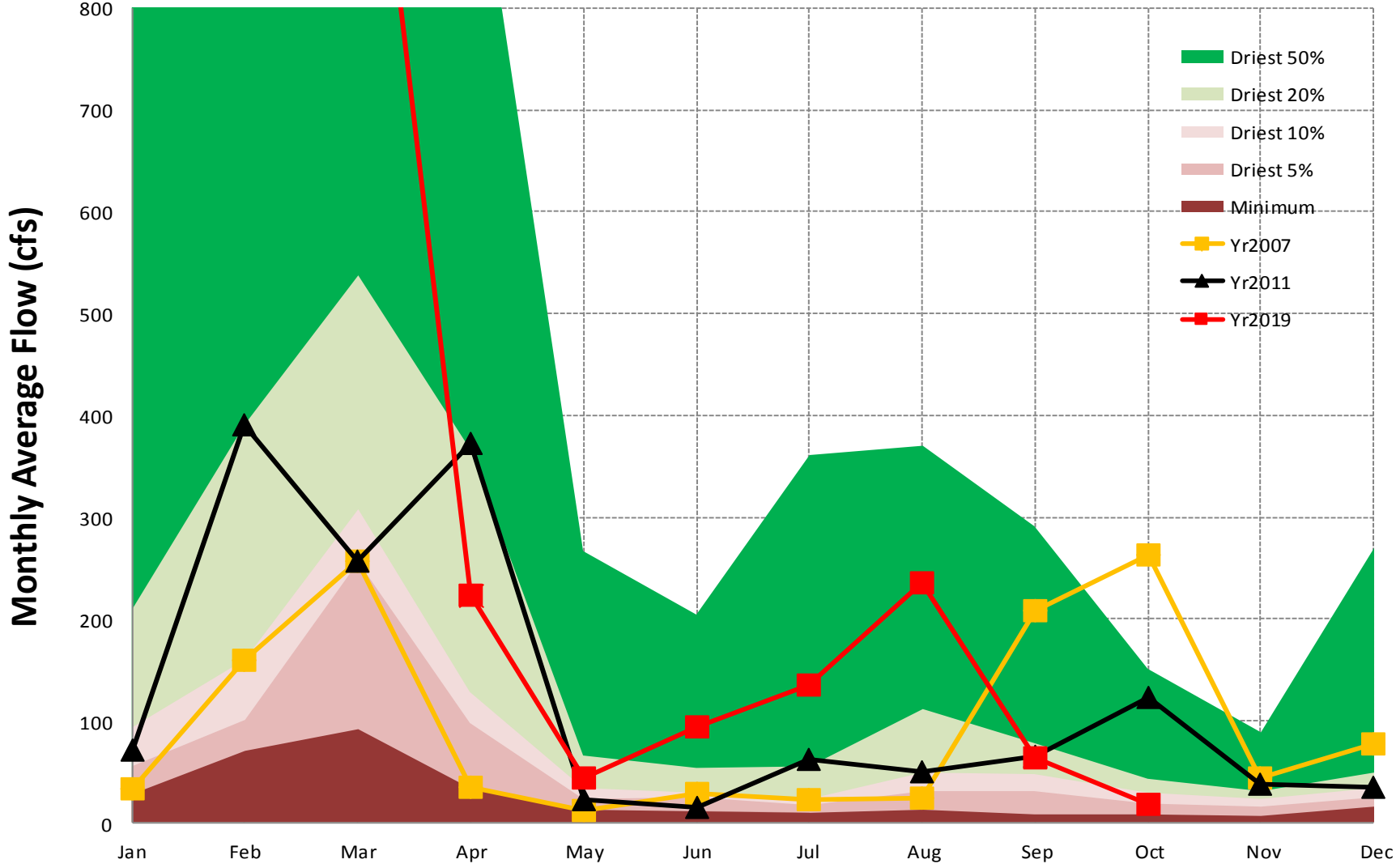
## Gage #32. USGS #02226500, Satilla Basin, Satilla River near Waycross, GA

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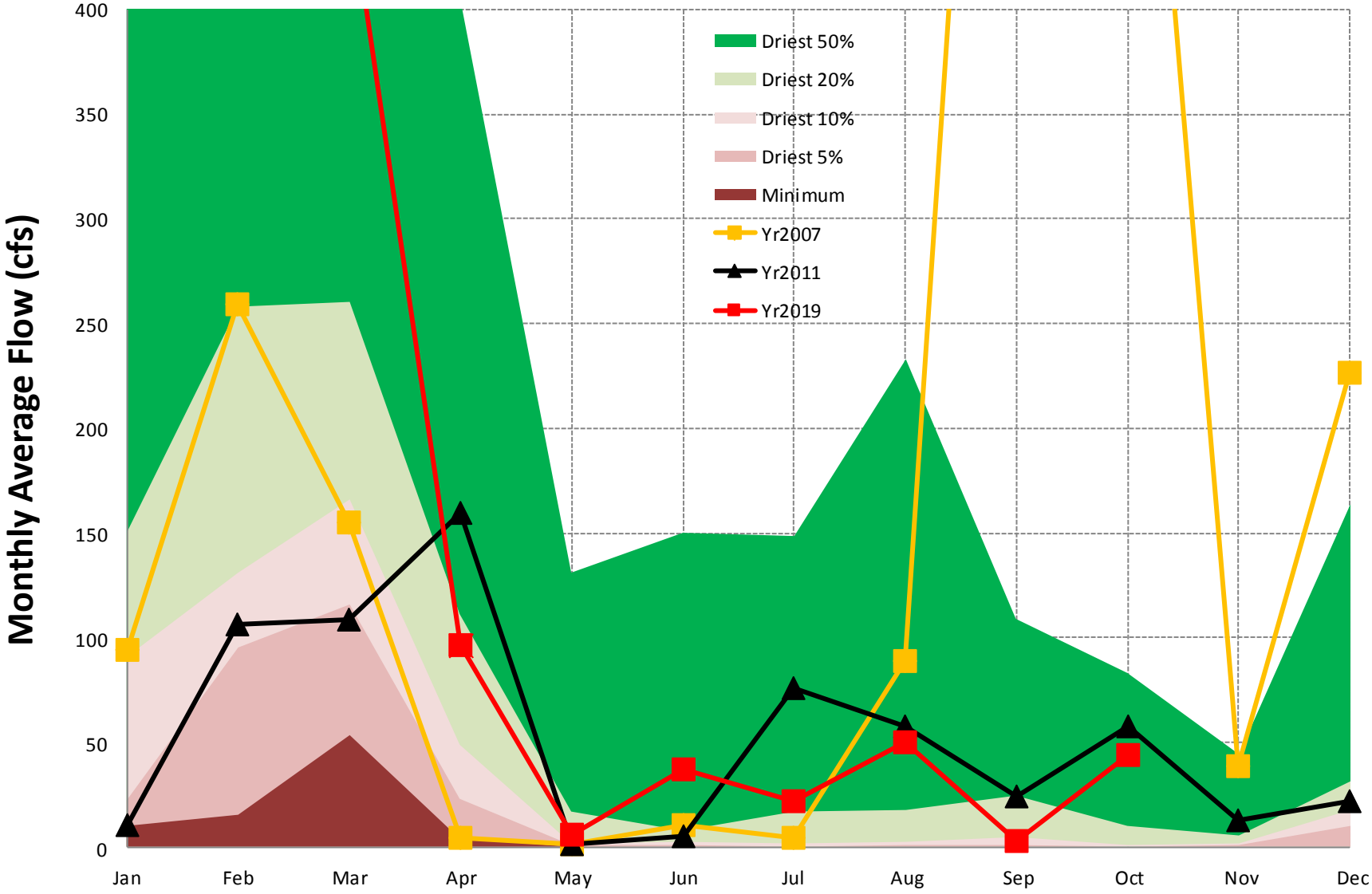
# Gage #33. USGS #02227500, Satilla Basin, LITTLE SATILLA RIVER near OFFERMAN, GA

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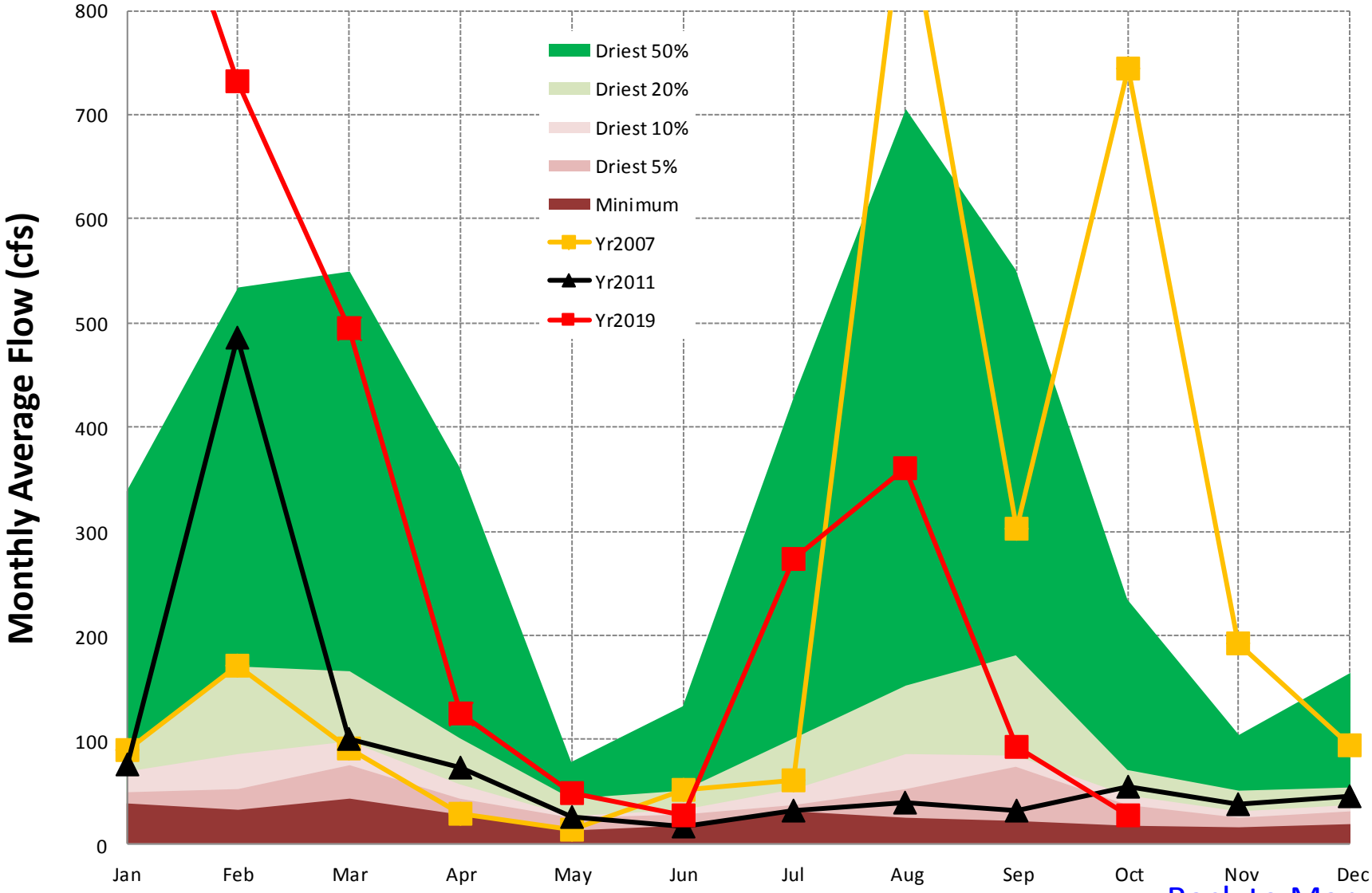
# Gage #34. USGS #02231000, St Mary Basin, ST. MARYS RIVER near MACCLENNY, FL

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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

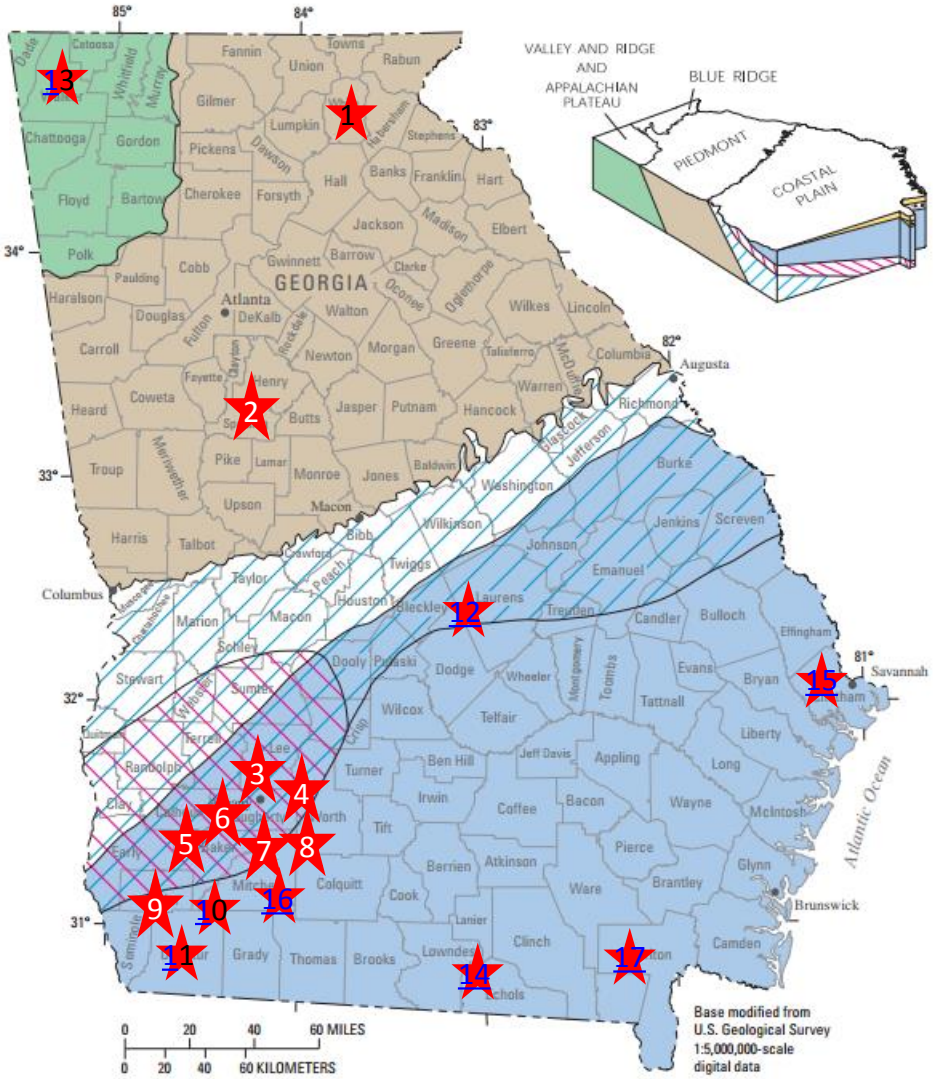



**Figure 2.** Area of use of principal aquifers and physiographic provinces in Georgia (modified from U.S. Geological Survey, 2006).

# Groundwater Level Graphs

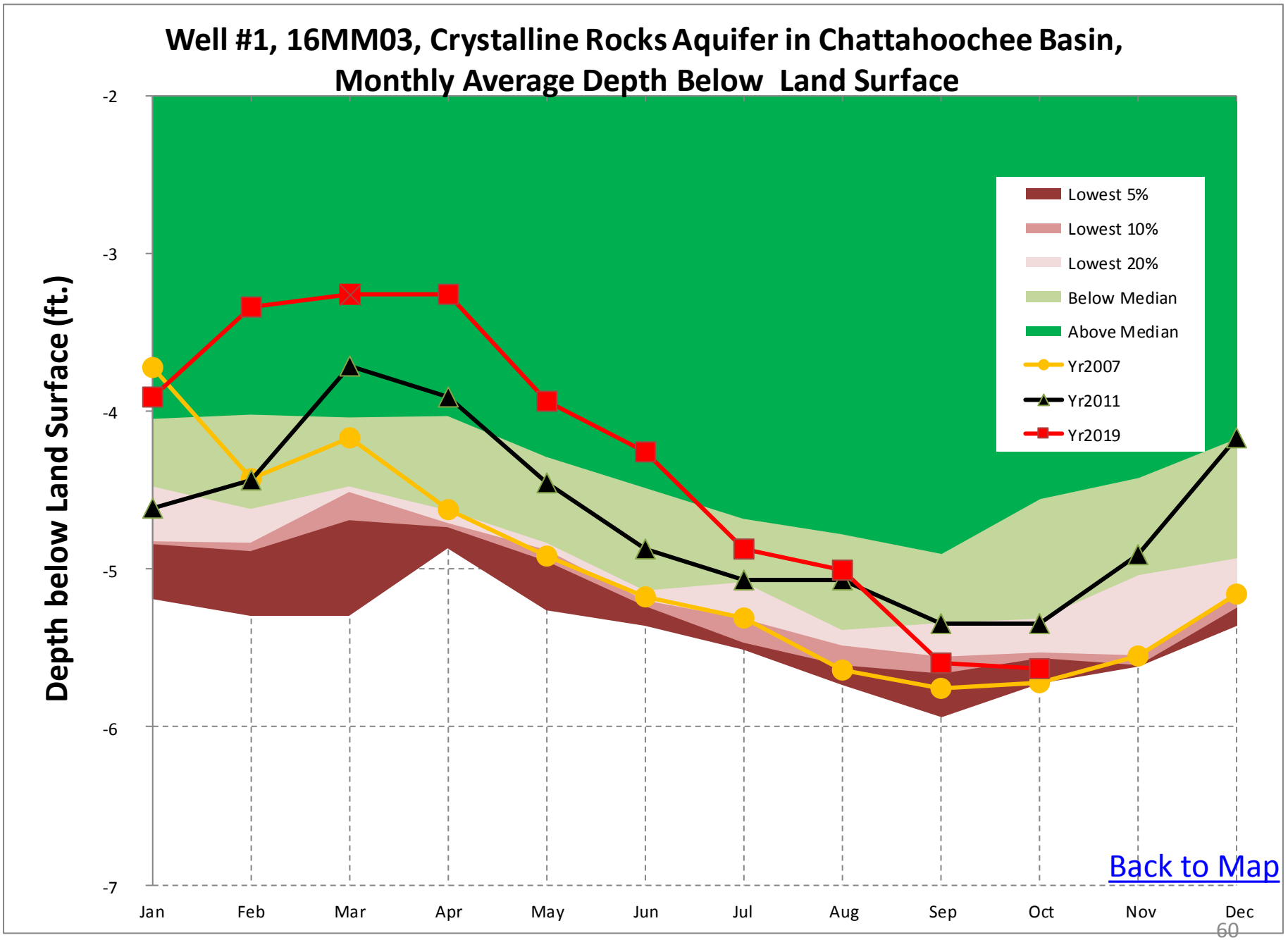
- For each of the 17 groundwater wells, EPD has prepared a graph that shows monthly average groundwater levels from January 2019 through October 2019;
- To help put these levels into perspective, for comparison purposes, each graph also shows:
  - Monthly average levels at that same well for the years 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.

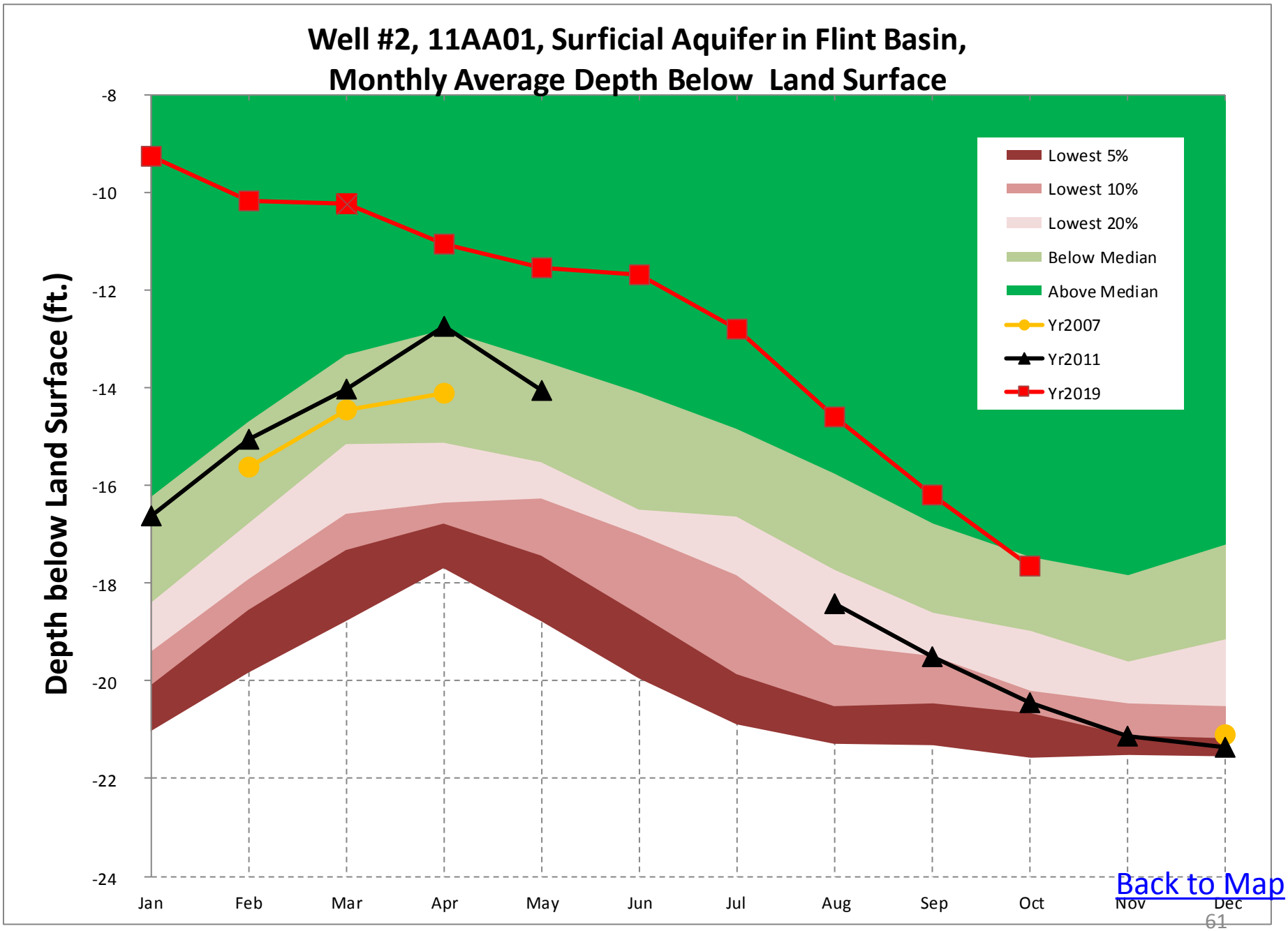
# How to Read the Groundwater Level Graphs

## Example: **Well #11, 09F520, Flint River Basin**

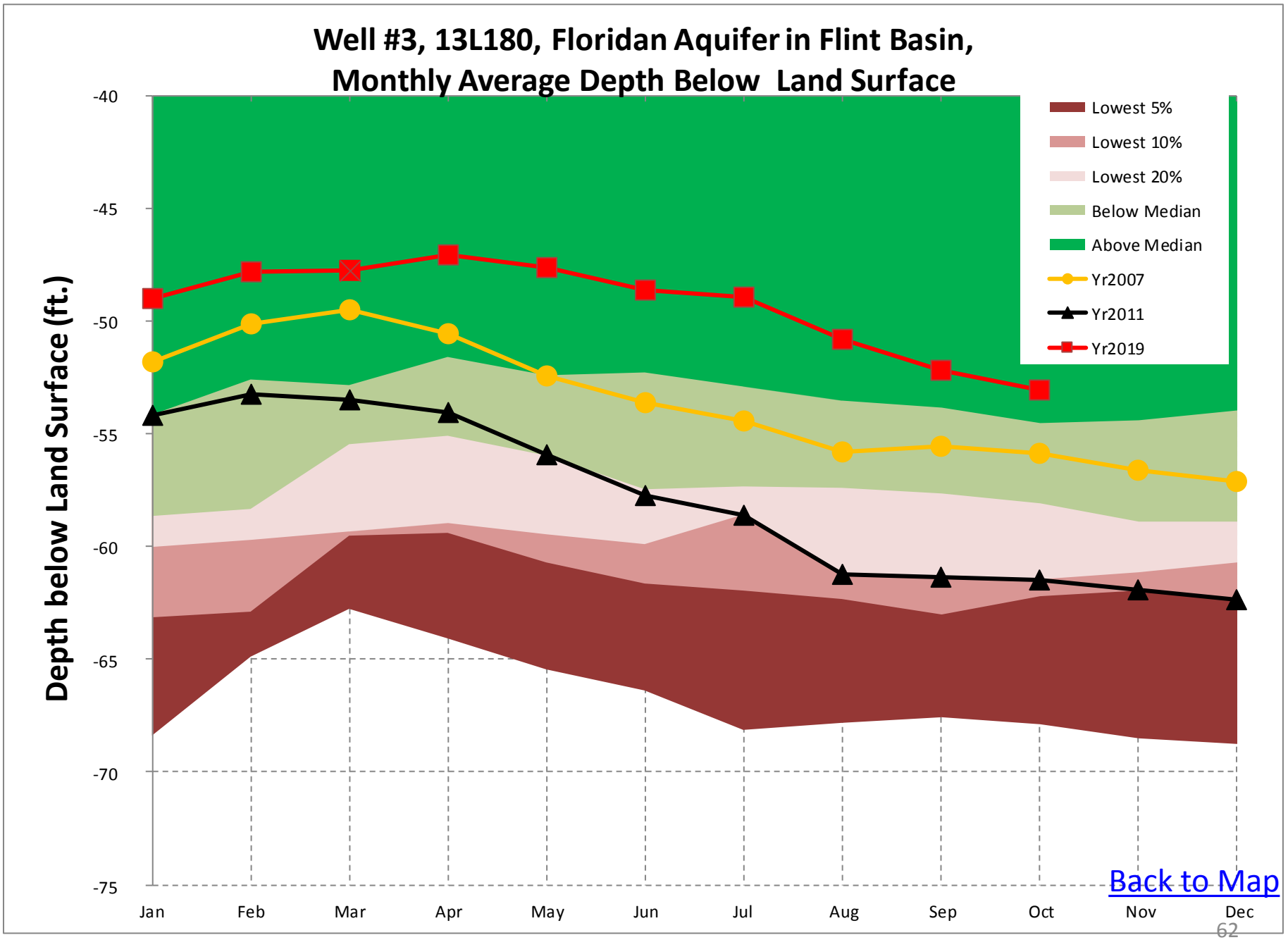
The groundwater level graph for Well #11, USGS 09F520 shows:

- The average monthly groundwater level for October 2019 was 48.6ft 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 2019 about 30% of the time; about 70% of the time in October they have been higher.
- The average monthly groundwater level in October 2011 was 50.9ft 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 2~5 % of the time; about 95~98 % of the time in October they have been higher.
- The average monthly groundwater level in October 2007 was 51ft 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 2~5% of the time; about 95~98% of the time in October they have been higher.

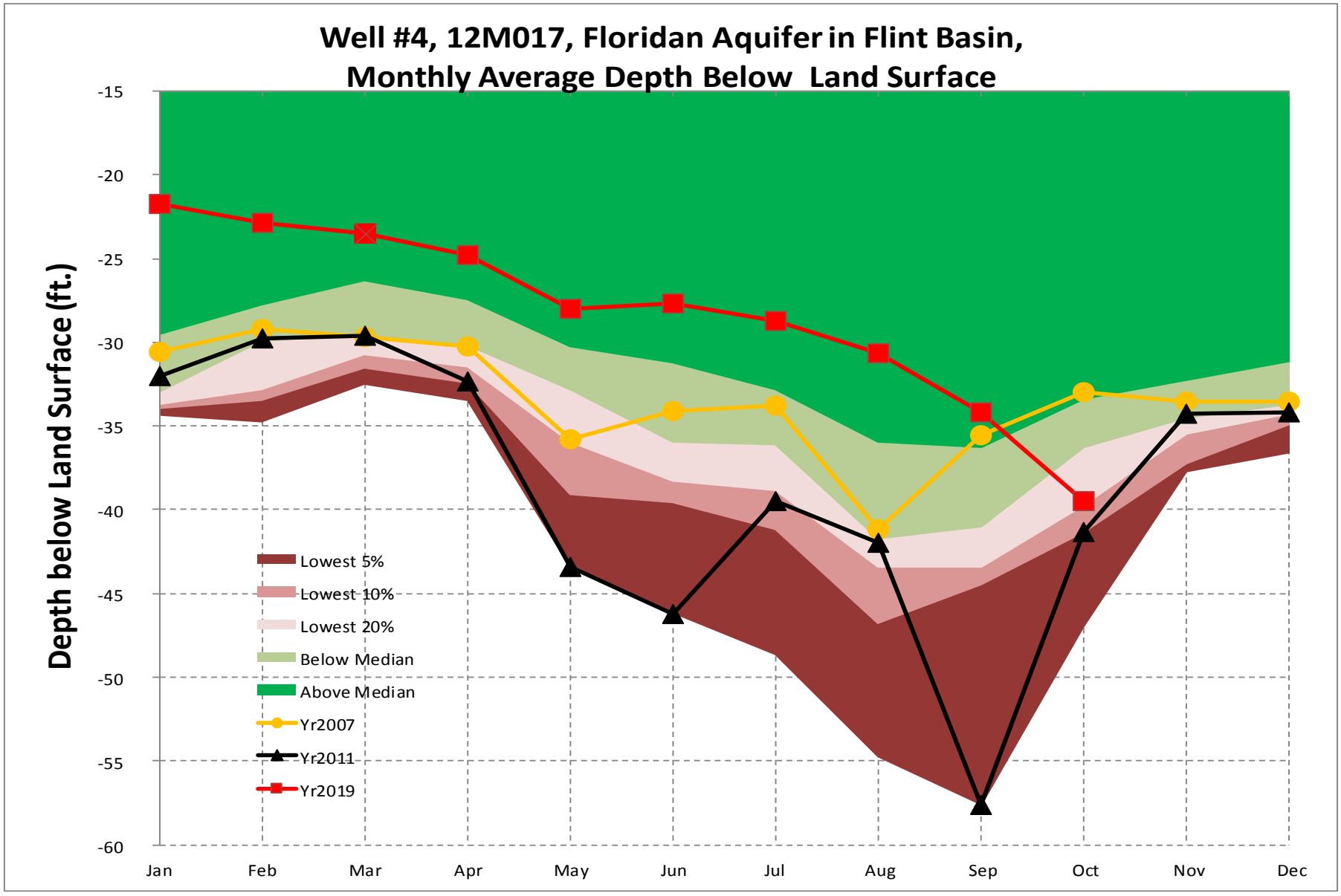

Well #1, 16MM03, Crystalline Rocks Aquifer in Chattahoochee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-2
-3
-4
-5
-6
-7
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019
Back to Map


Well #2, 11AA01, Surficial Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-8
-10
-12
-14
-16
-18
-20
-22
-24
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

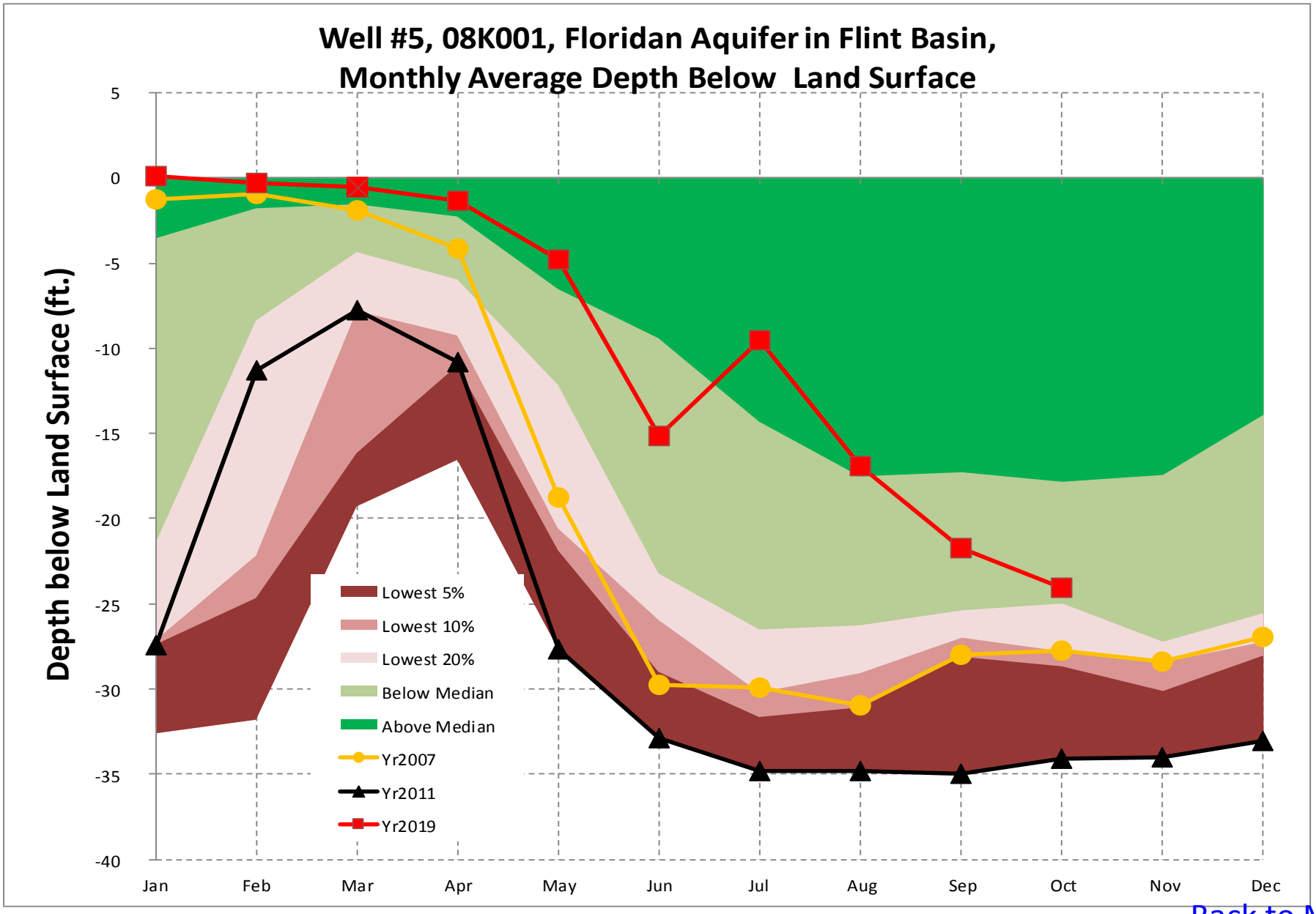
Back to Map


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 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

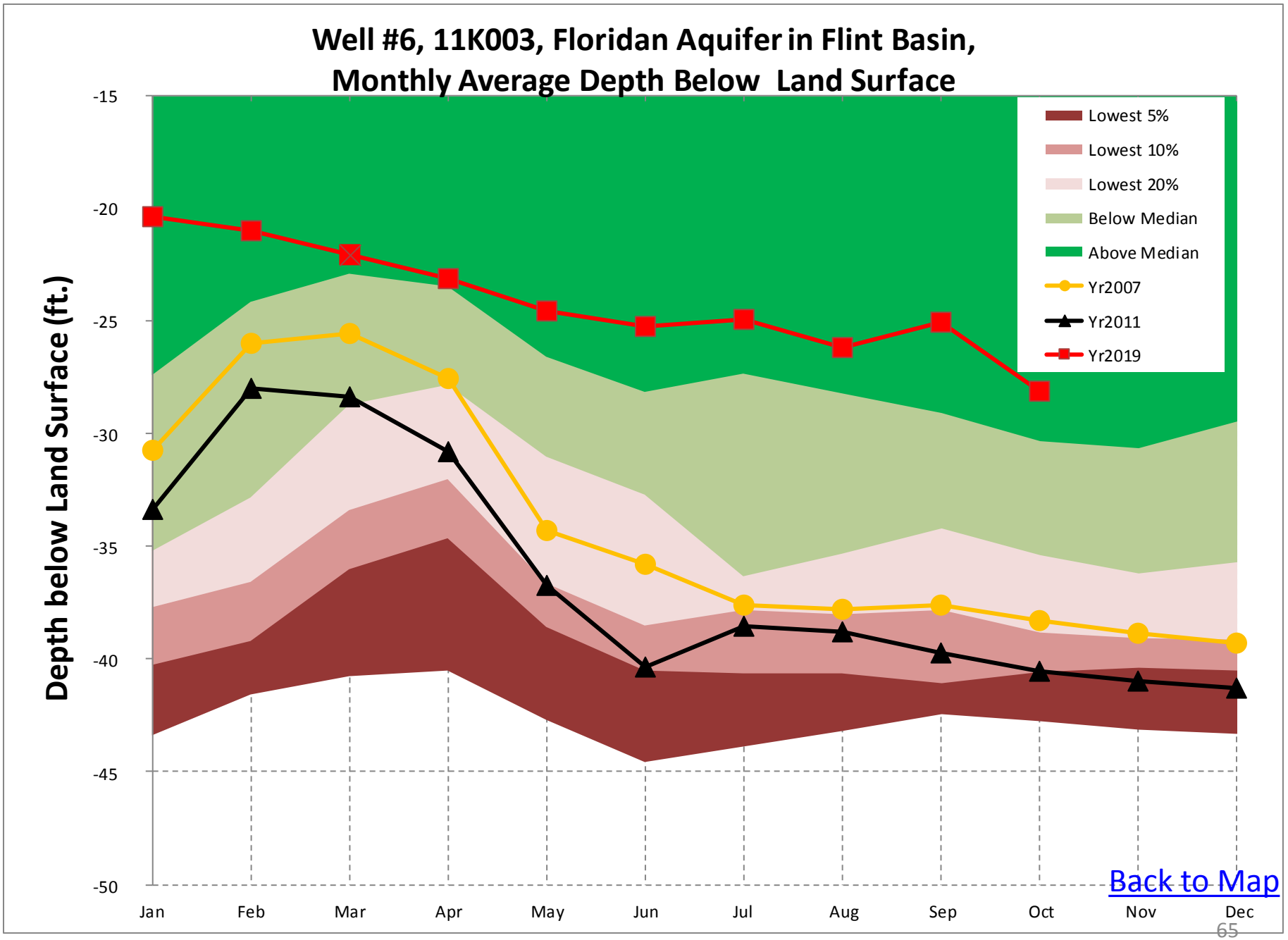
Back to Map


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 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

Back to Map


Well #5, 08K001, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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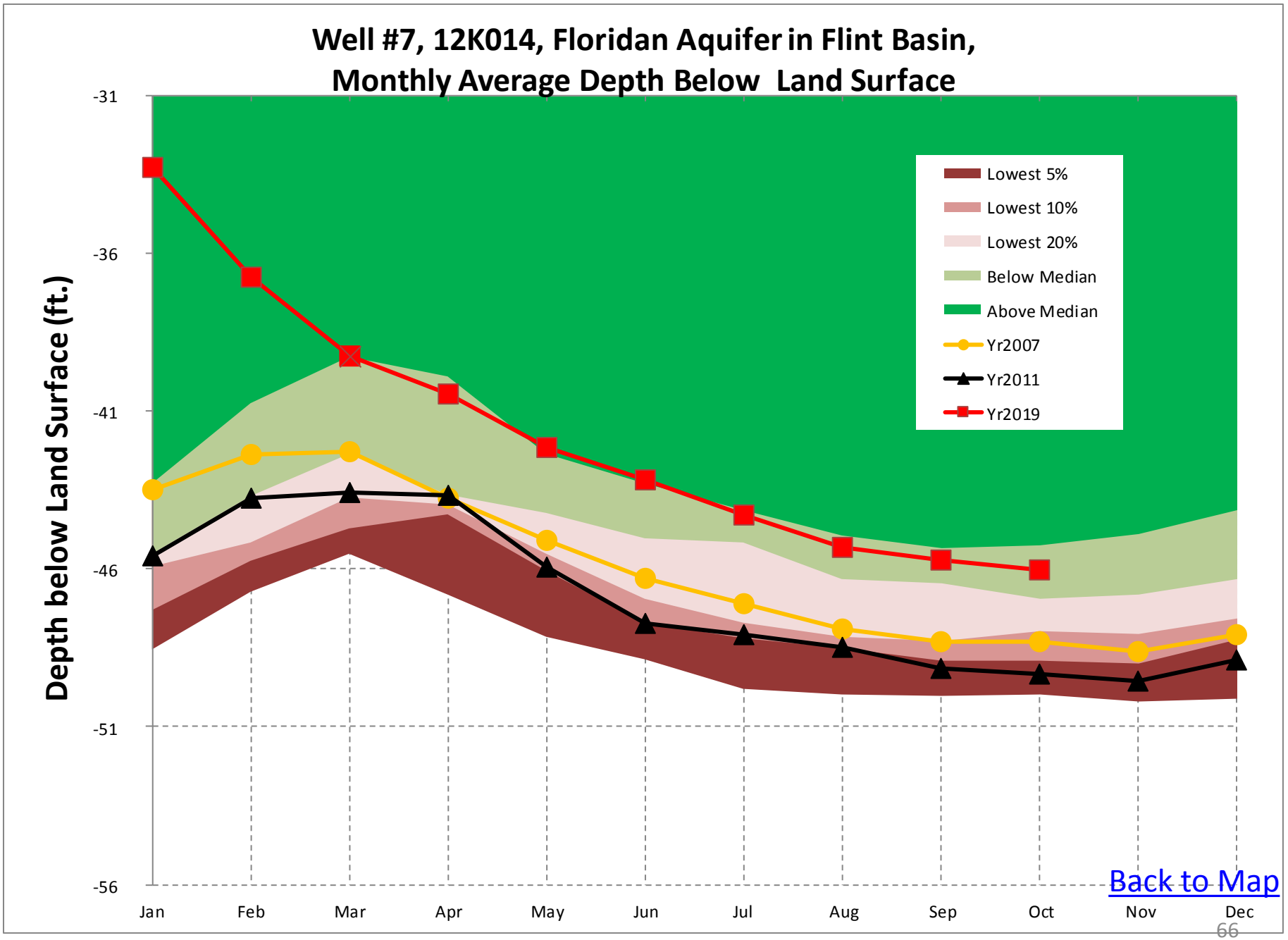
Well #7, 12K014, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-31
-36
-41
-46
-51
-56
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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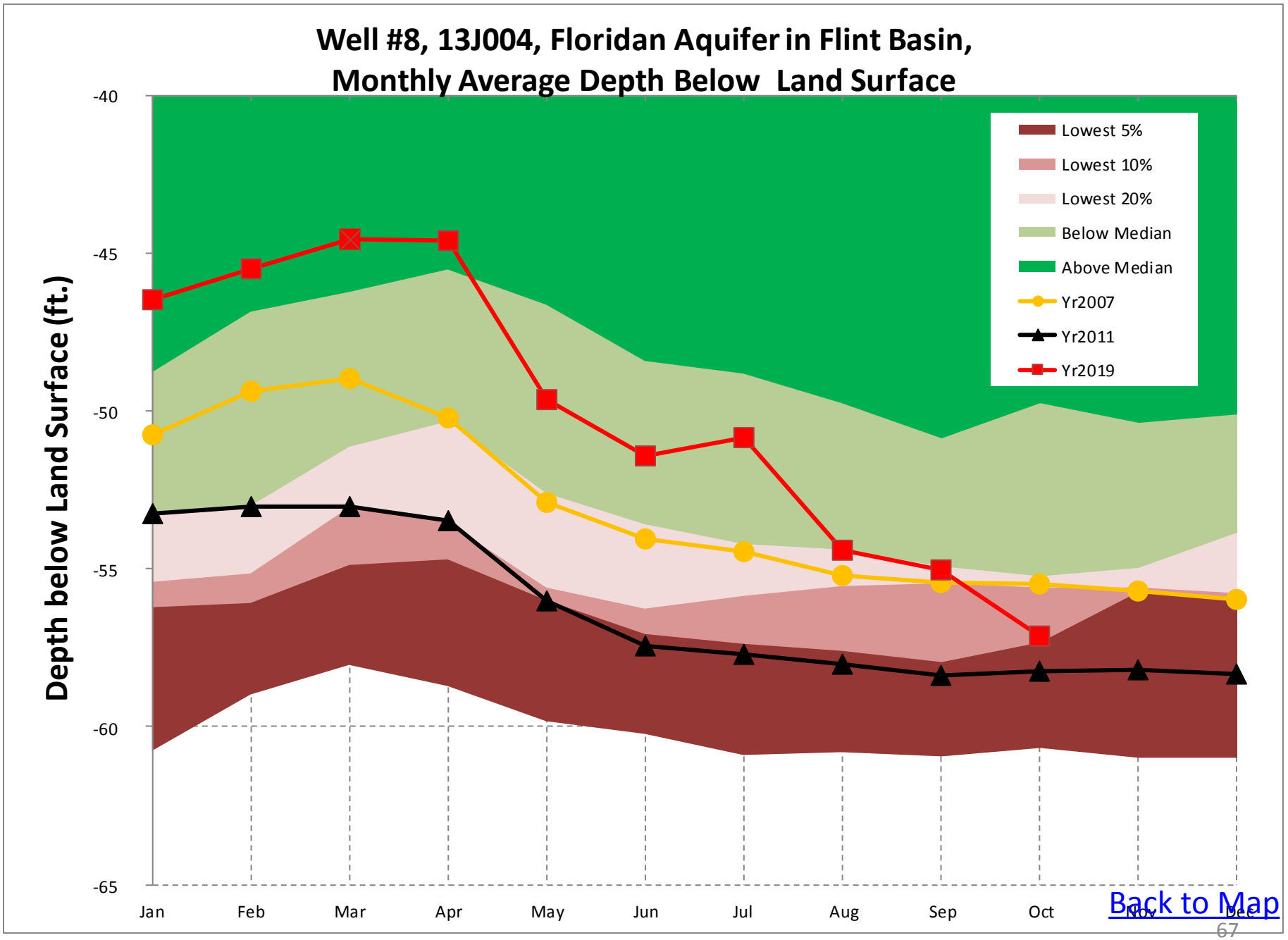
Well #8, 13J004, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-40
-45
-50
-55
-60
-65
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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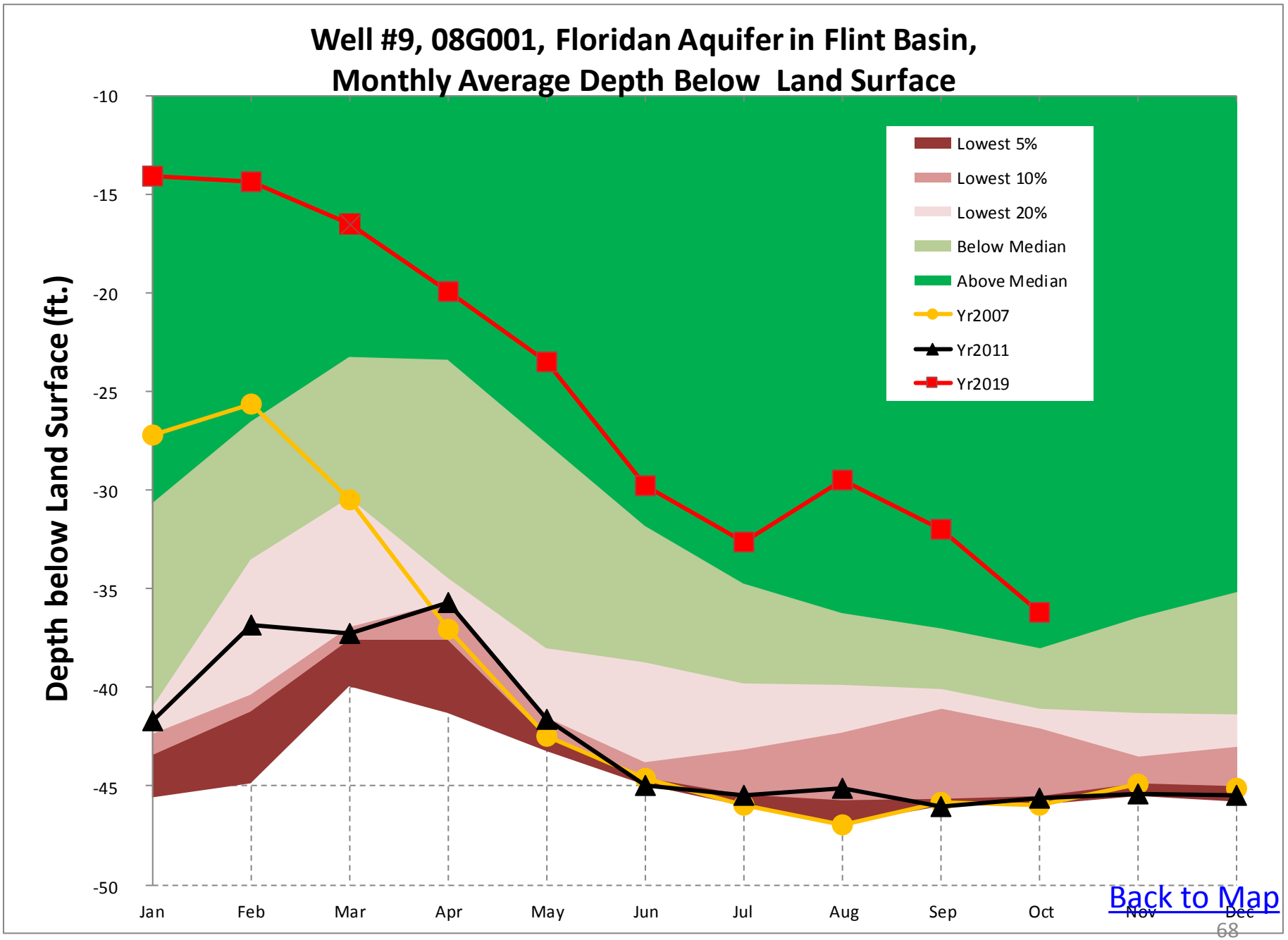
Well #9, 08G001, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-10
-15
-20
-25
-30
-35
-40
-45
-50
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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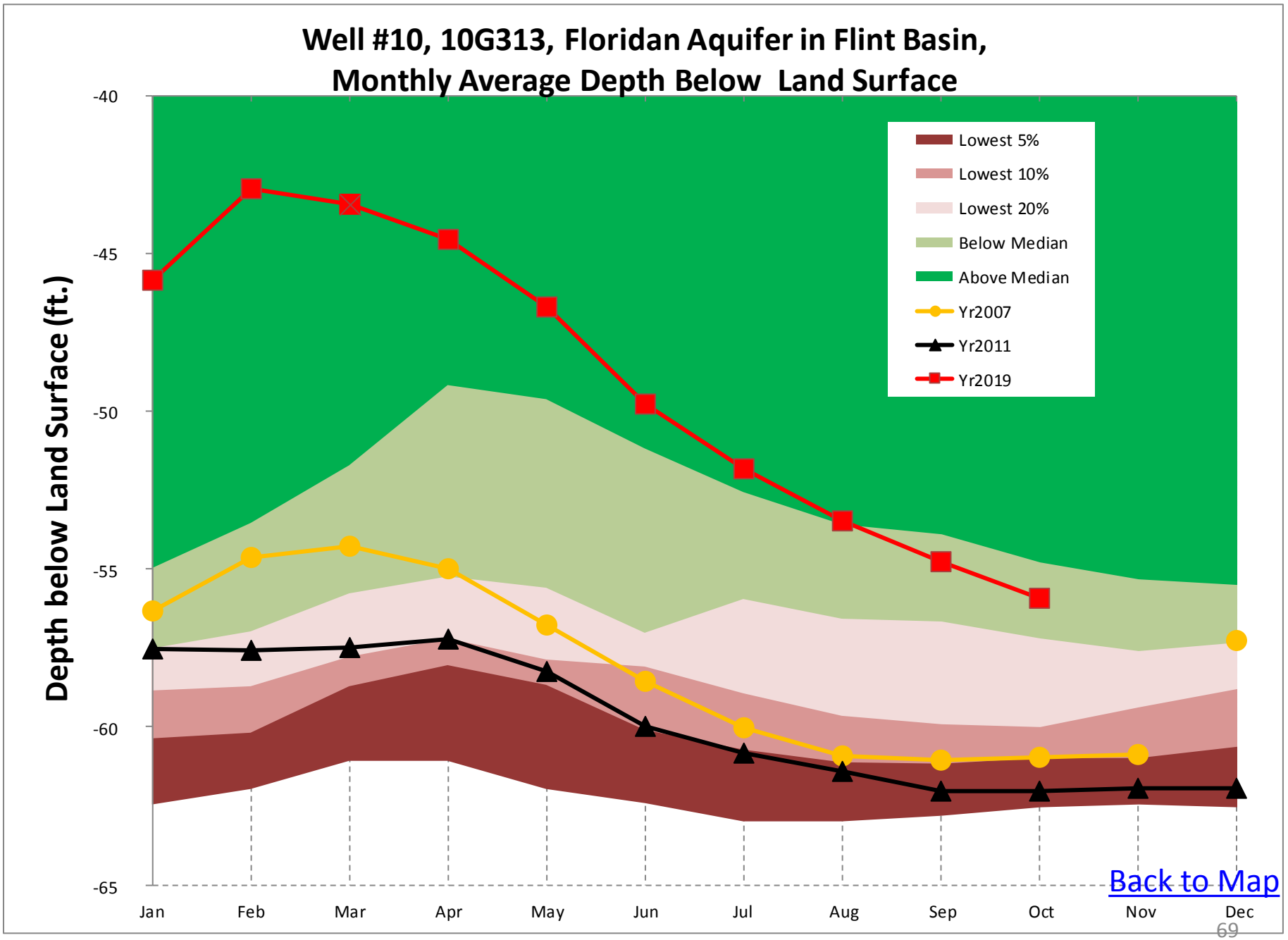
Well #10, 10G313, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-40
-45
-50
-55
-60
-65
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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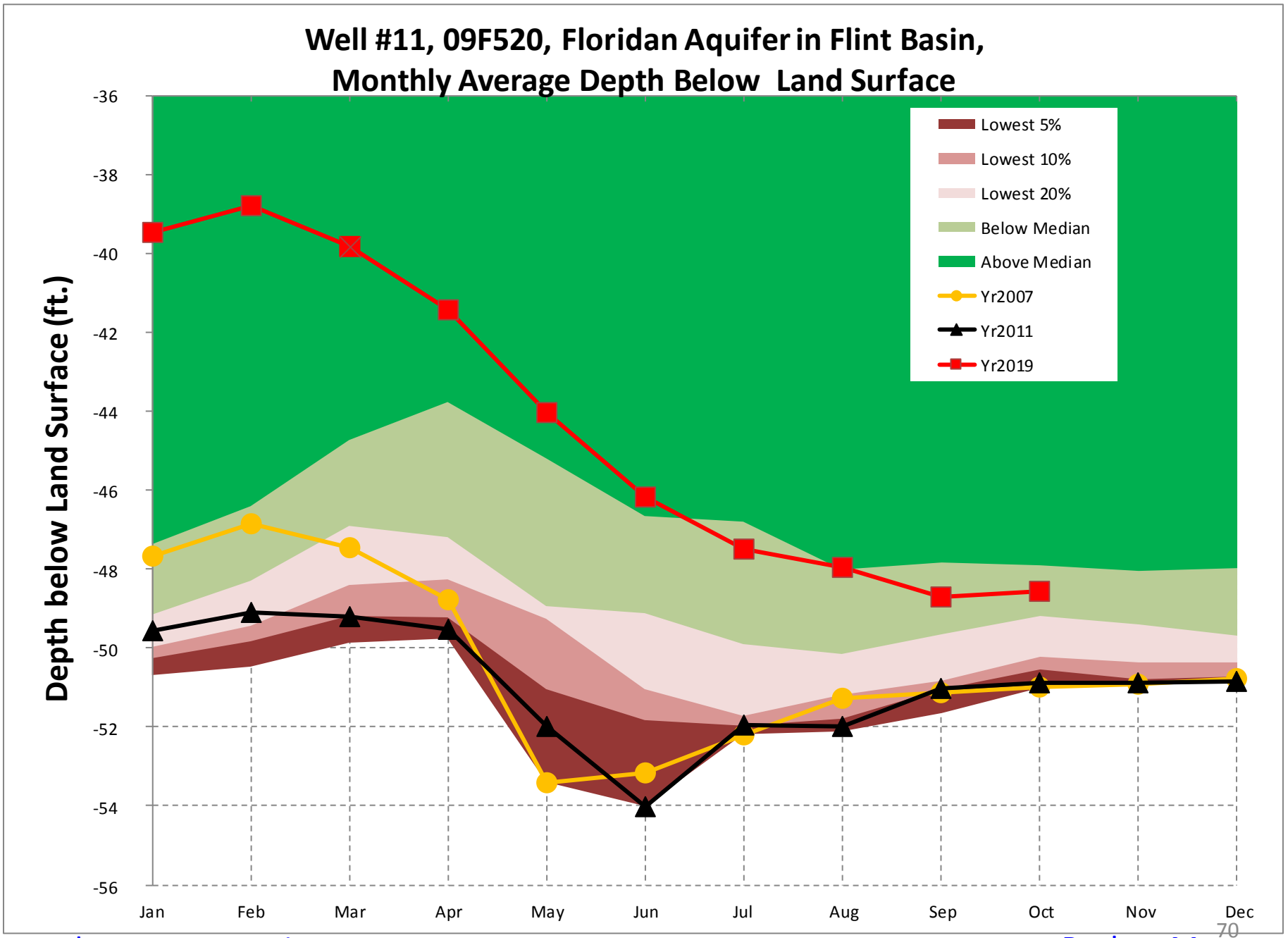




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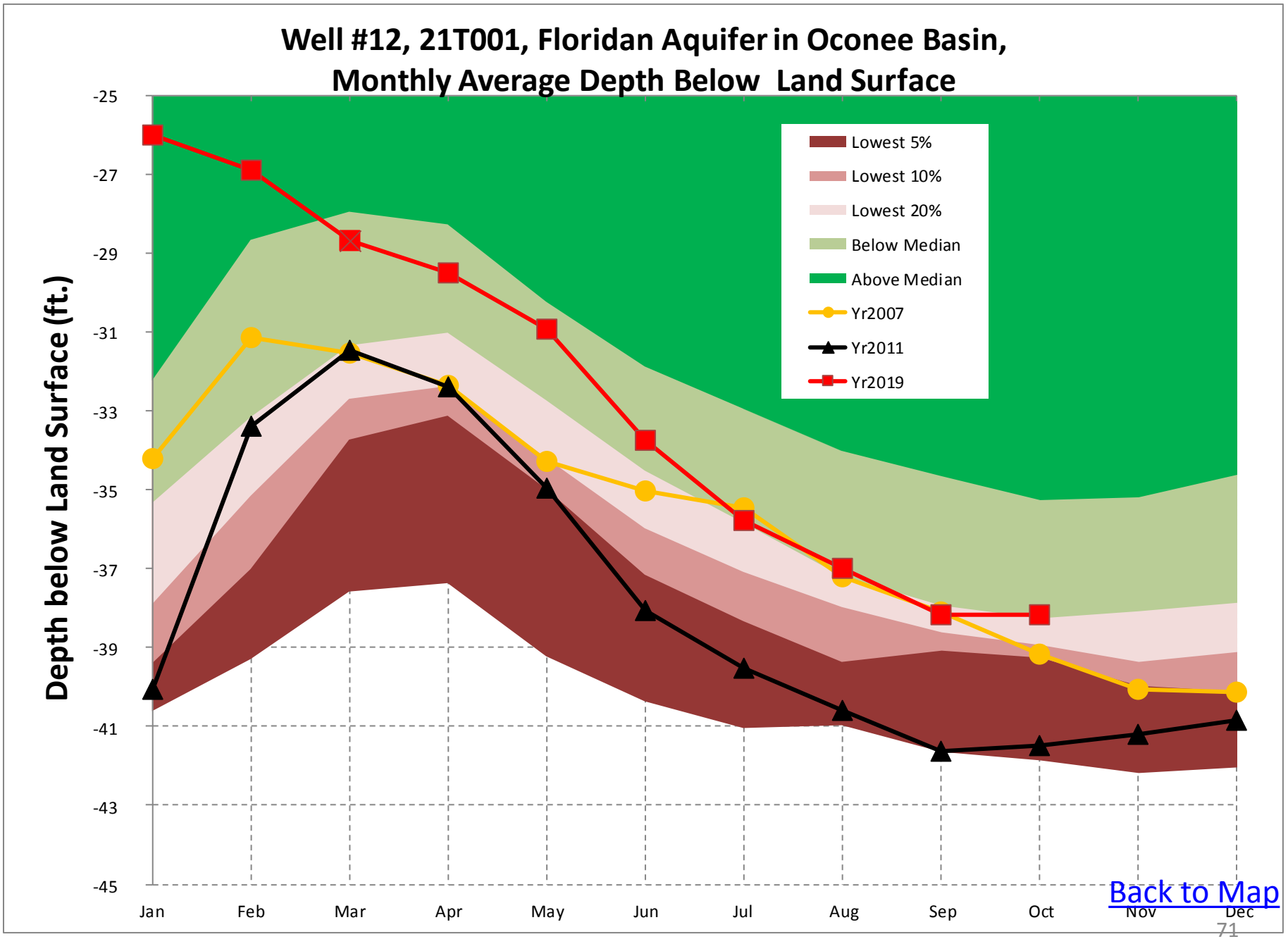
Well #12, 21T001, Floridan Aquifer in Oconee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-25
-27
-29
-31
-33
-35
-37
-39
-41
-43
-45
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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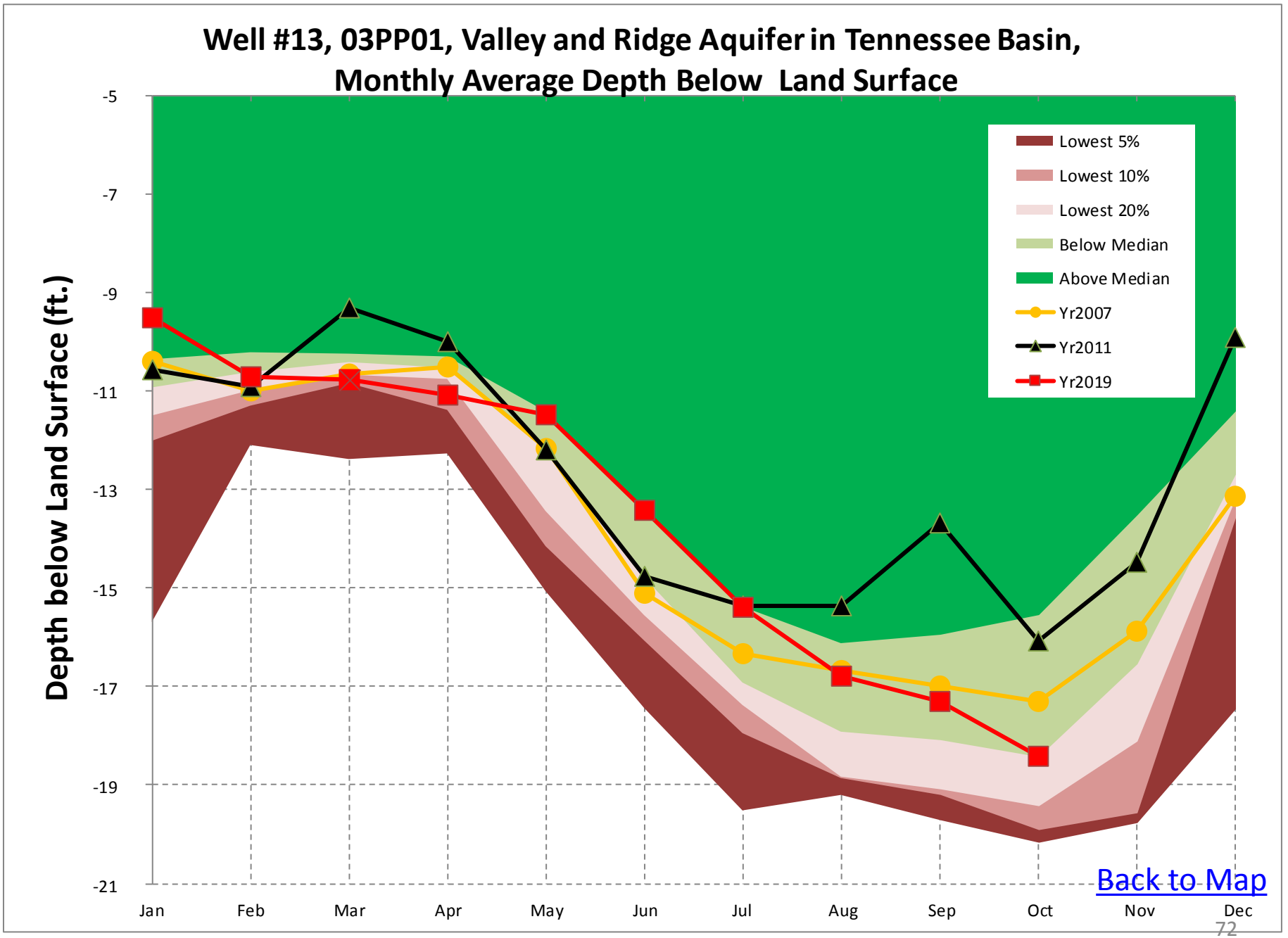
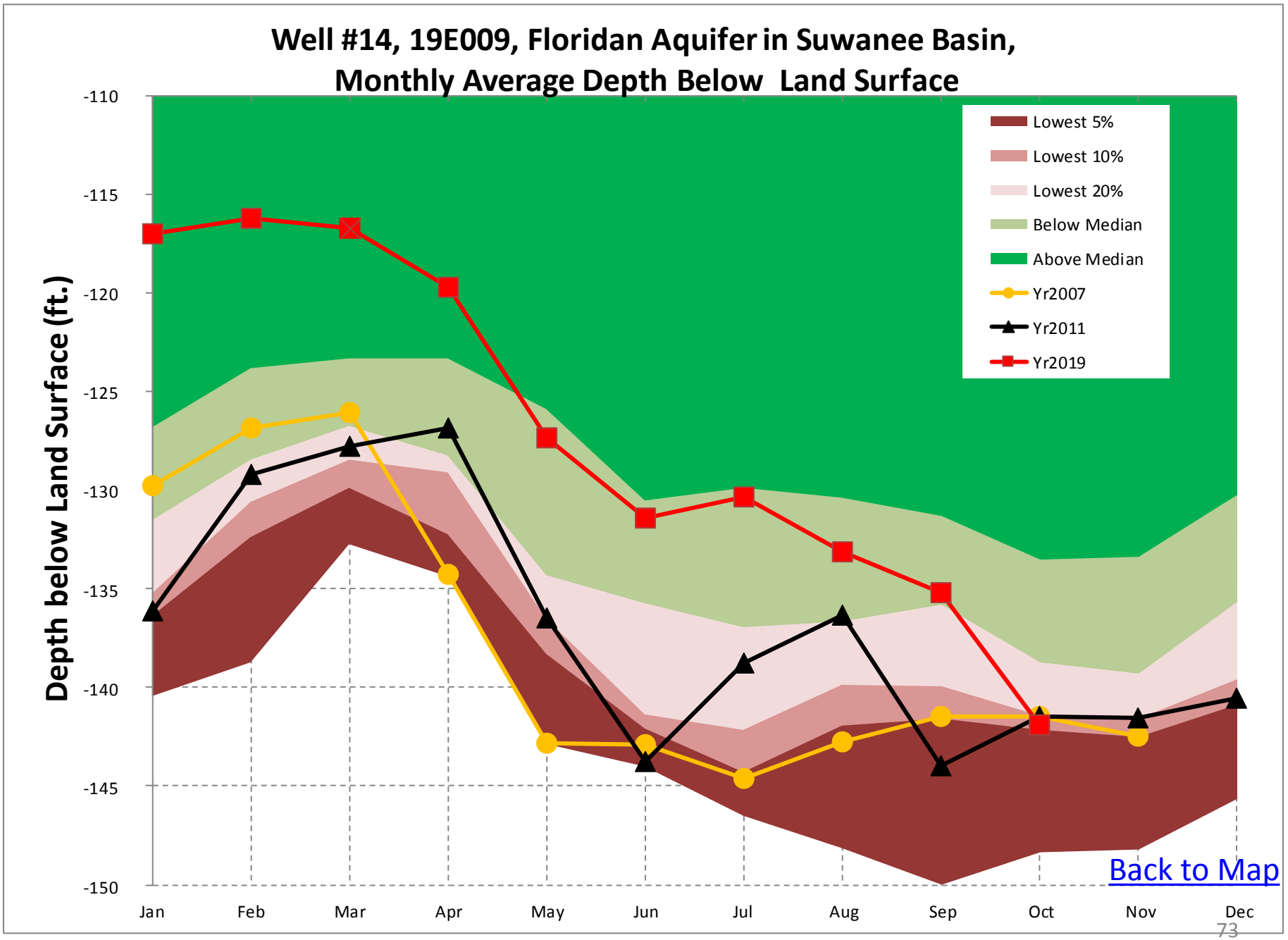

Well #13, 03PP01, Valley and Ridge Aquifer in Tennessee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-5
-7
-9
-11
-13
-15
-17
-19
-21
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019
Back to 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 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019
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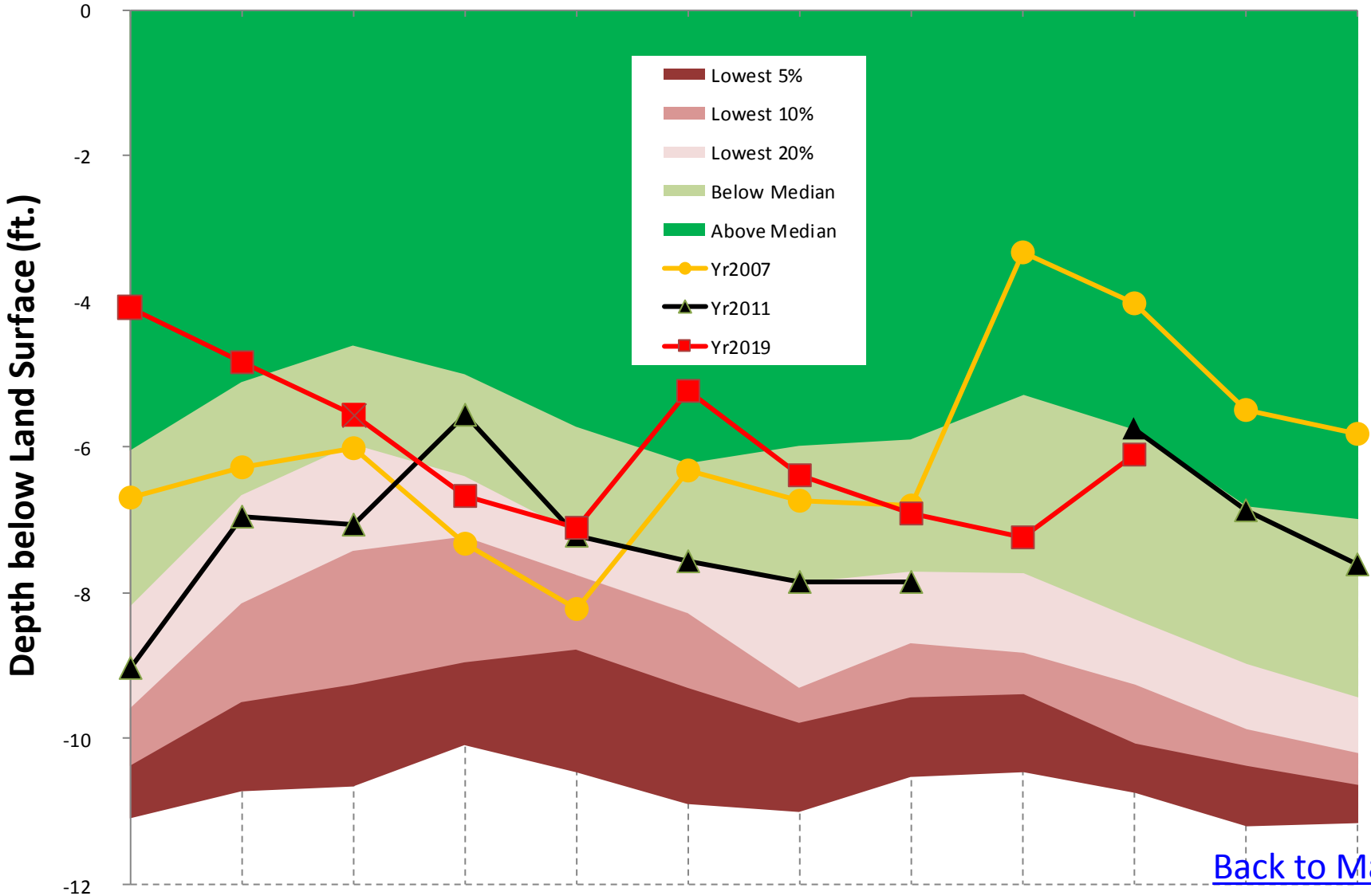
# Well #15, 35P094, Surficial Aquifer in Ogeechee Basin, Monthly Average Depth Below Land Surface

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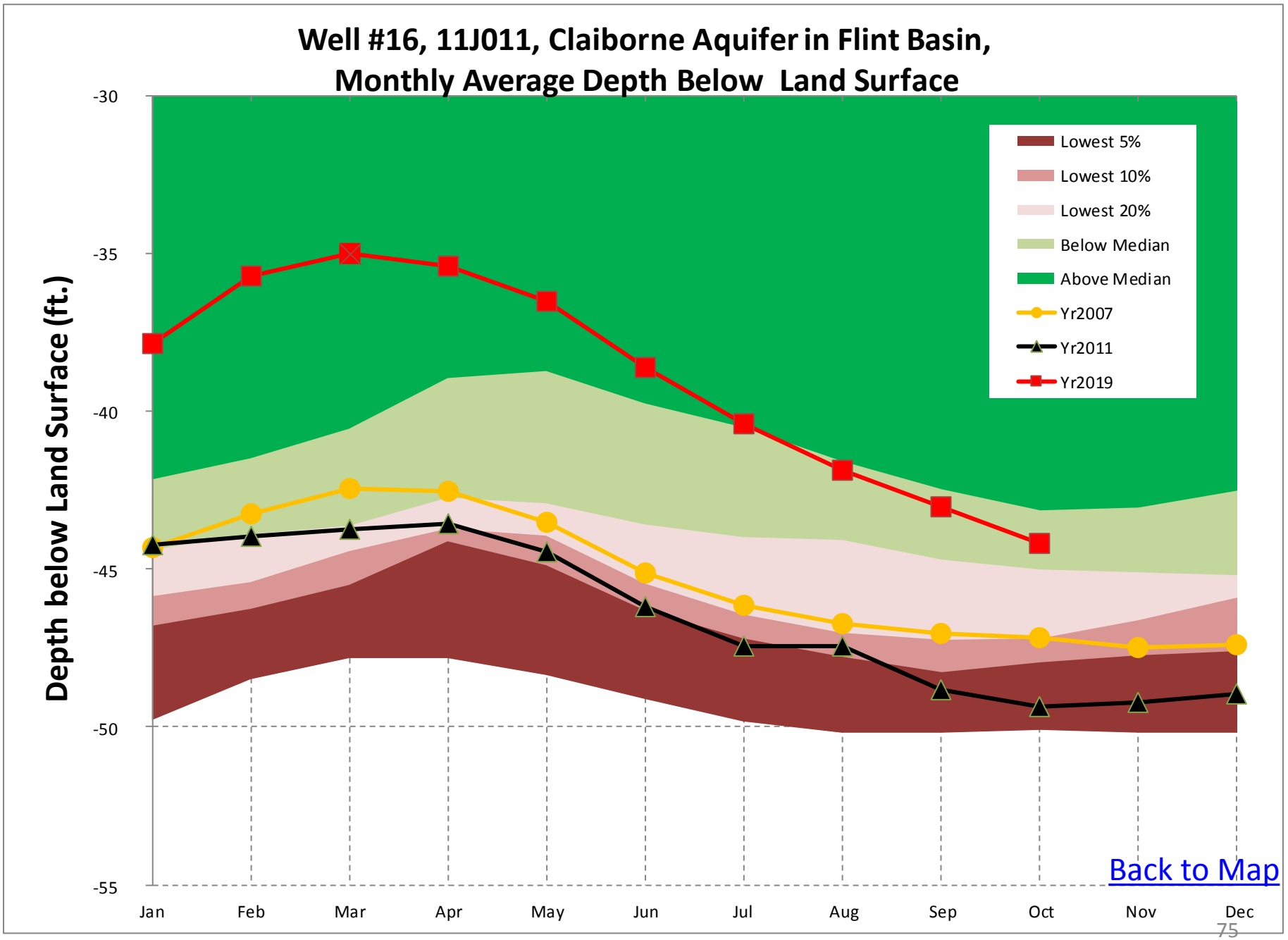
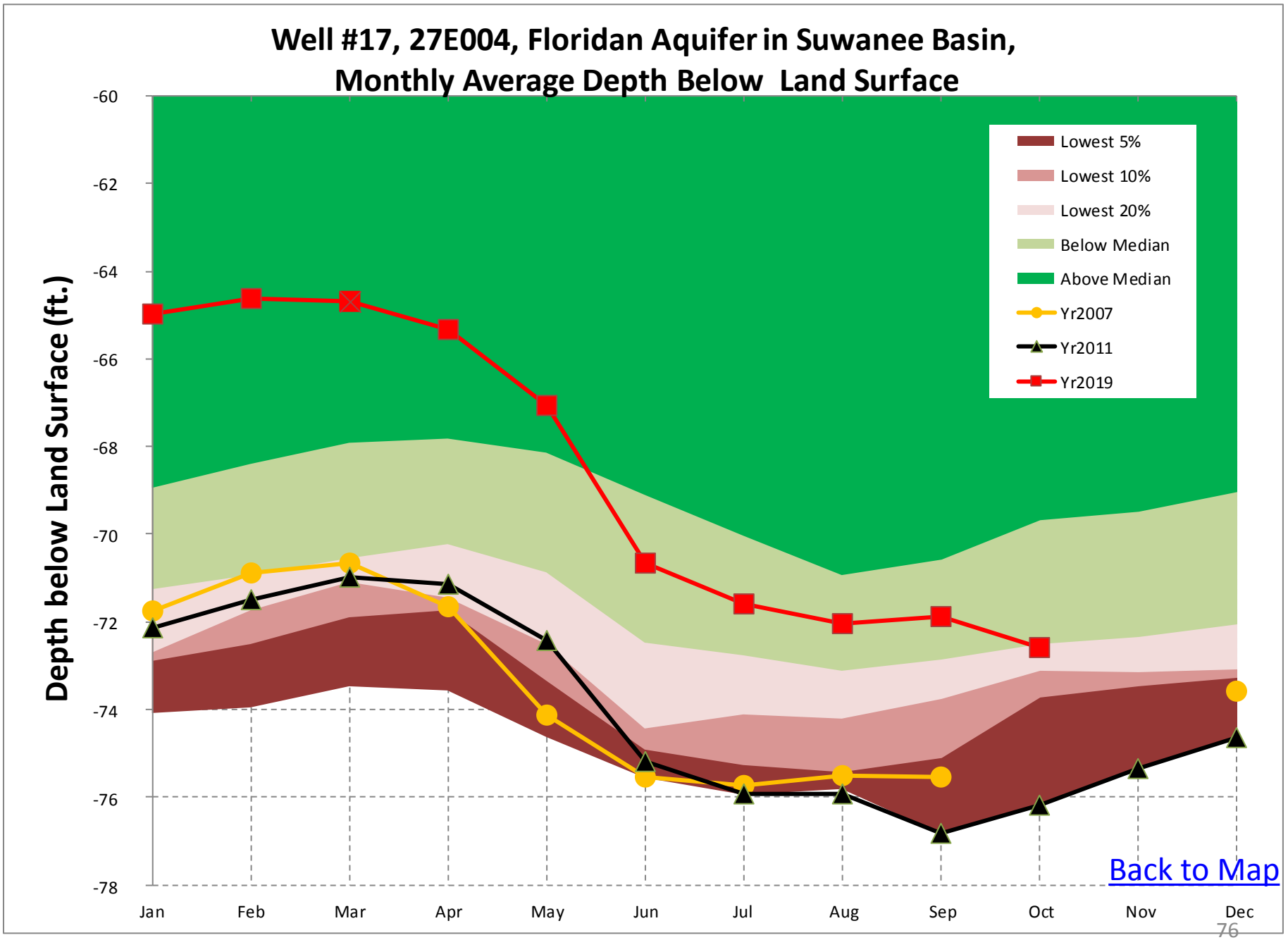

Well #16, 11J011, Claiborne Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-30
-35
-40
-45
-50
-55
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019
Back to Map


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
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2019

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# Reservoir Levels

Data Source:
US Army Corps of Engineers

**Coosa Basin**
1. Carters
2. Allatoona

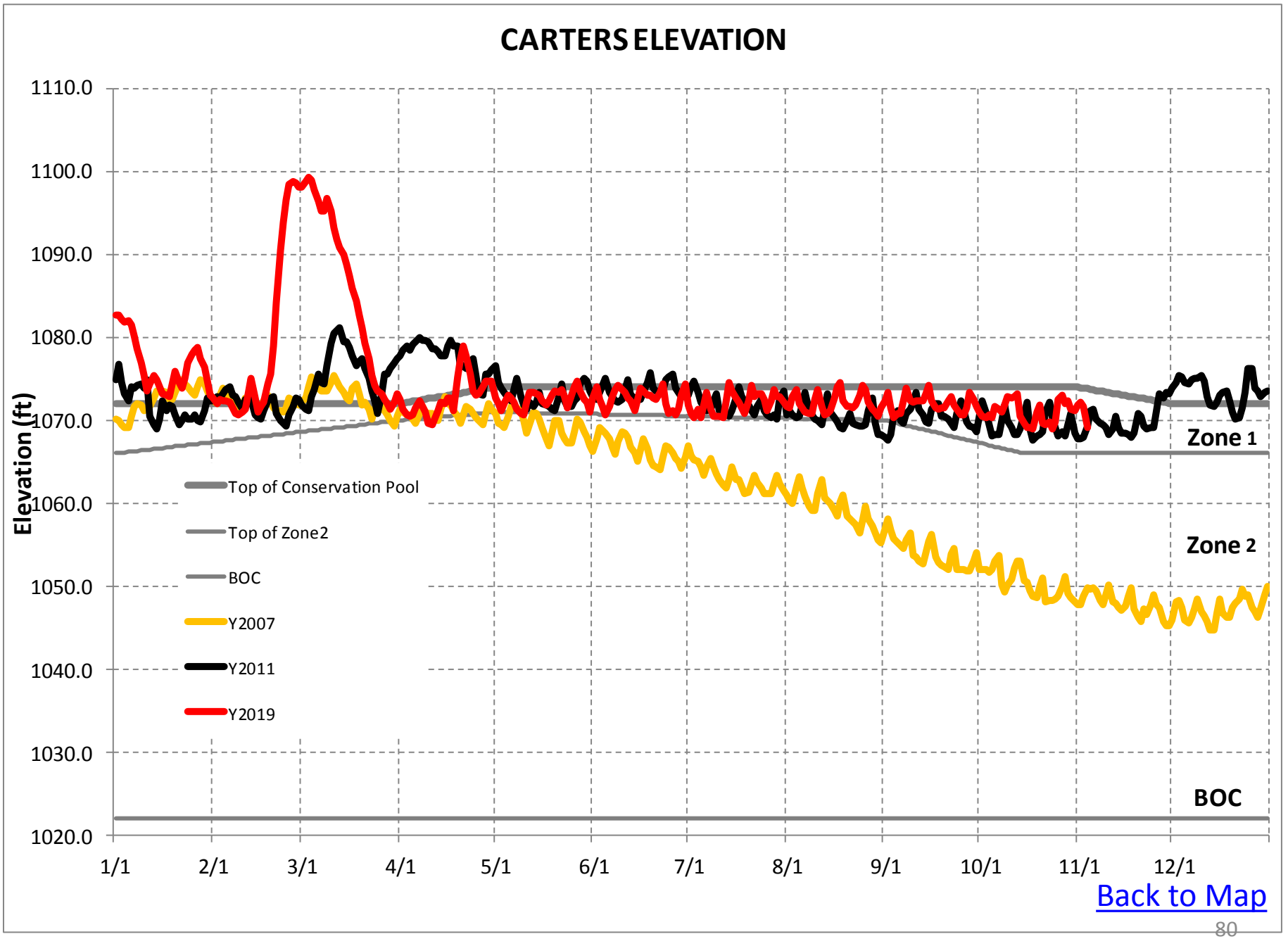
**Chattahoochee Basin**
3. Lanier
4. West Point
5. W.F. George

**Savannah Basin**
6. Hartwell
7. Thurmond

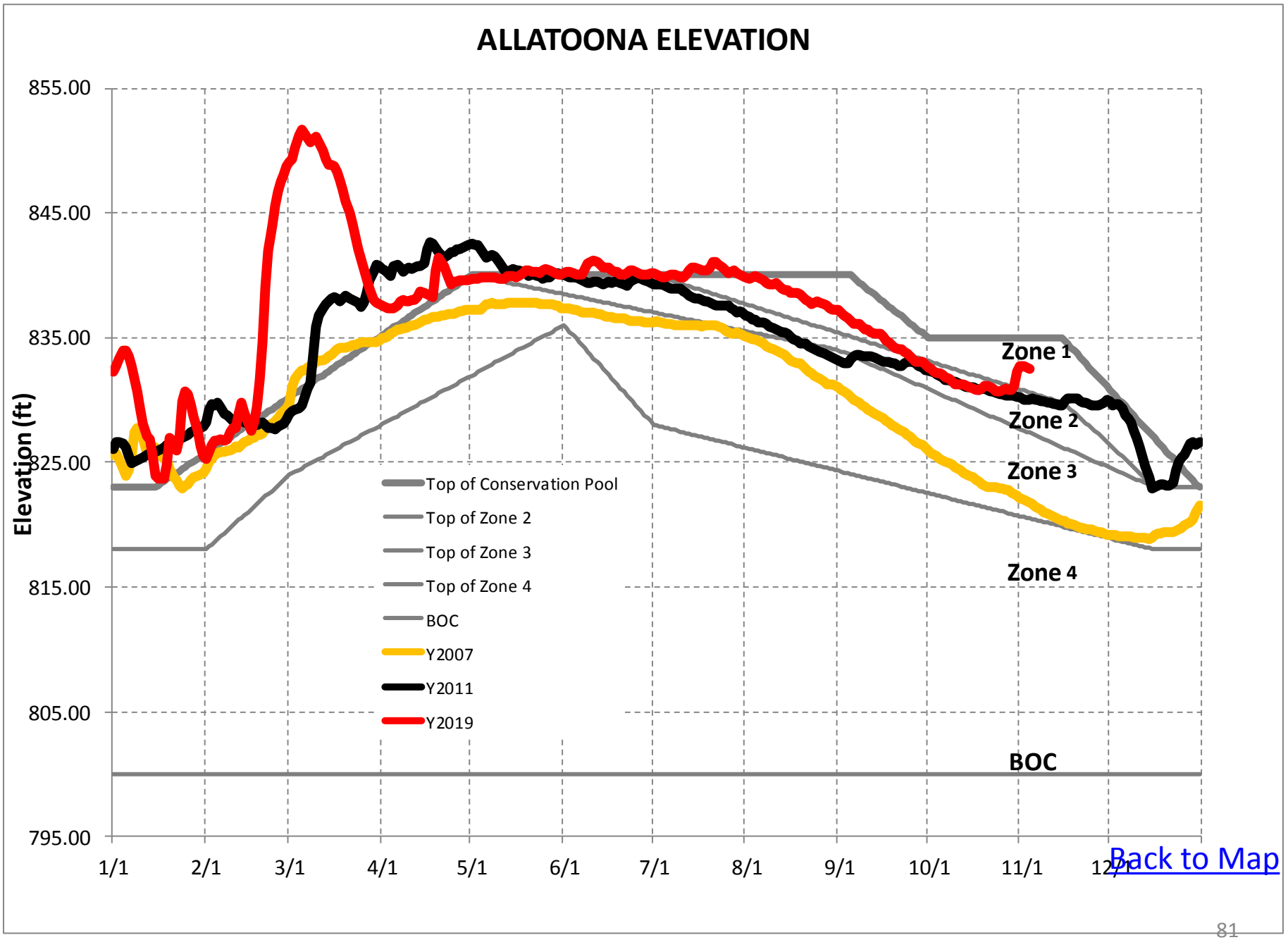

EPD monitors the water levels of seven reservoirs to assess drought conditions.

# Reservoir Elevation Graphs

- The following graphs show the reservoir elevation curves for January 2019 through October 2019.
- 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 2019 reservoir elevations into perspective, elevations for 2007 and 2011 are also shown.


CARTERS ELEVATION
Elevation (ft)
1110.0
1100.0
1090.0
1080.0
1070.0
1060.0
1050.0
1040.0
1030.0
1020.0
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
Y2019
Zone 1
Zone 2
BOC

Back to Map


ALLATOONA ELEVATION
855.00
845.00
835.00
825.00
815.00
805.00
795.00
Elevation (ft)
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
Y2019
Zone 1
Zone 2
Zone 3
Zone 4
BOC

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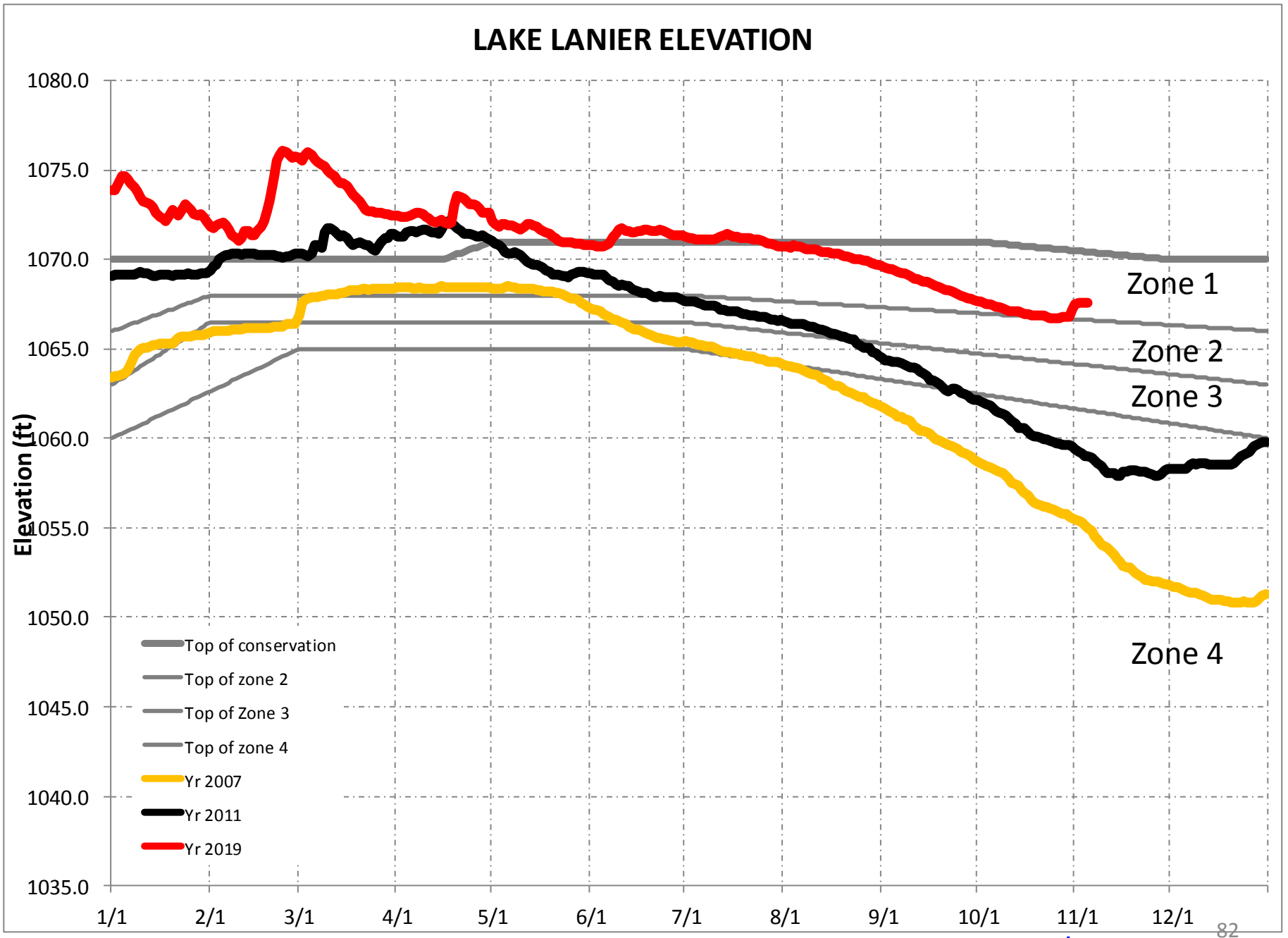
LAKE LANIER ELEVATION
Elevation (ft)
1080.0
1075.0
1070.0
1065.0
1060.0
1055.0
1050.0
1045.0
1040.0
1035.0
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Yr 2007
Yr 2011
Yr 2019



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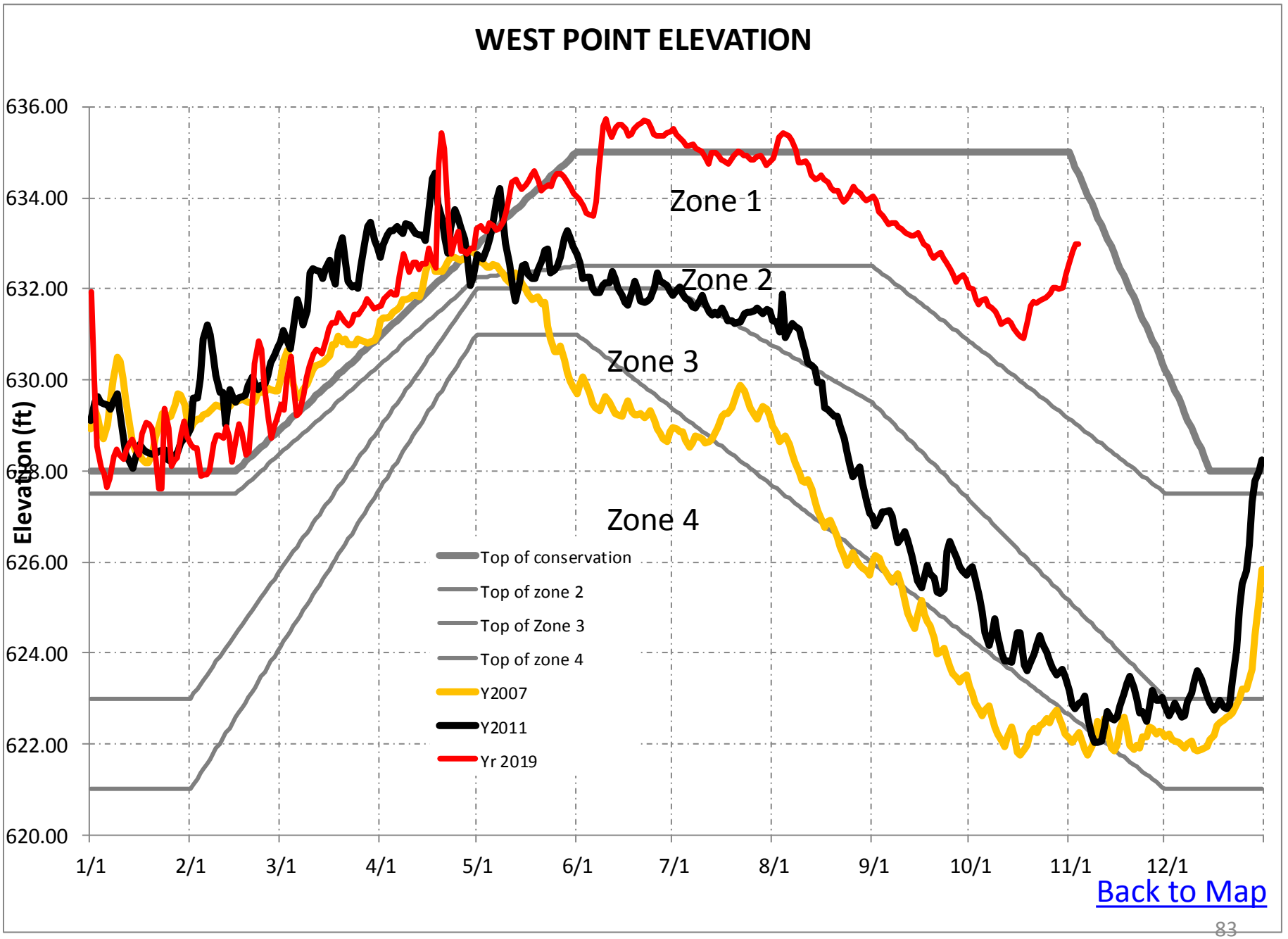
WEST POINT ELEVATION
636.00
634.00
632.00
630.00
628.00
626.00
624.00
622.00
620.00
Elevation (ft)
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Y2007
Y2011
Yr 2019

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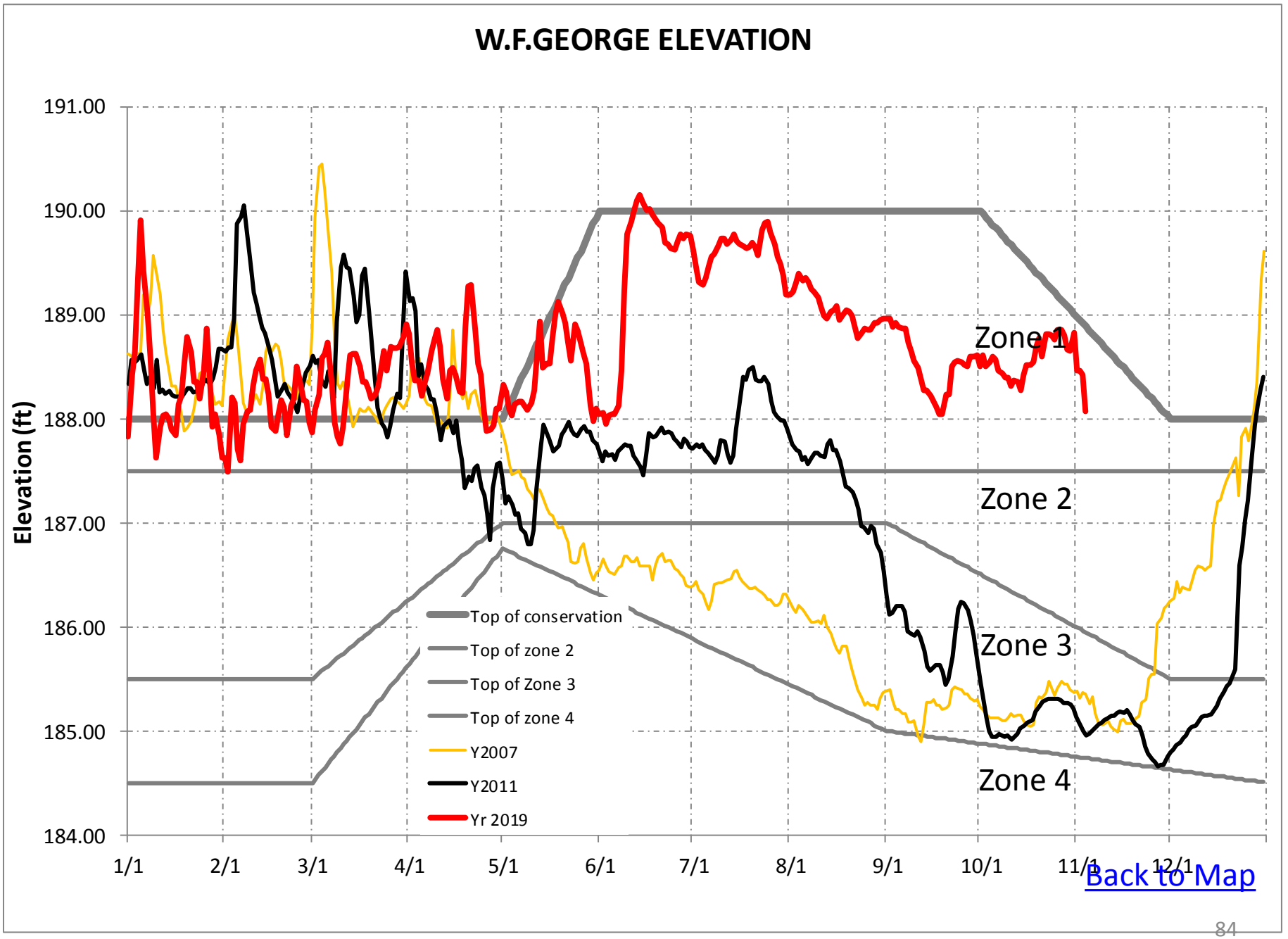
W.F.GEORGE ELEVATION
191.00
190.00
189.00
188.00
187.00
186.00
185.00
184.00
Elevation (ft)
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Y2007
Y2011
Yr 2019

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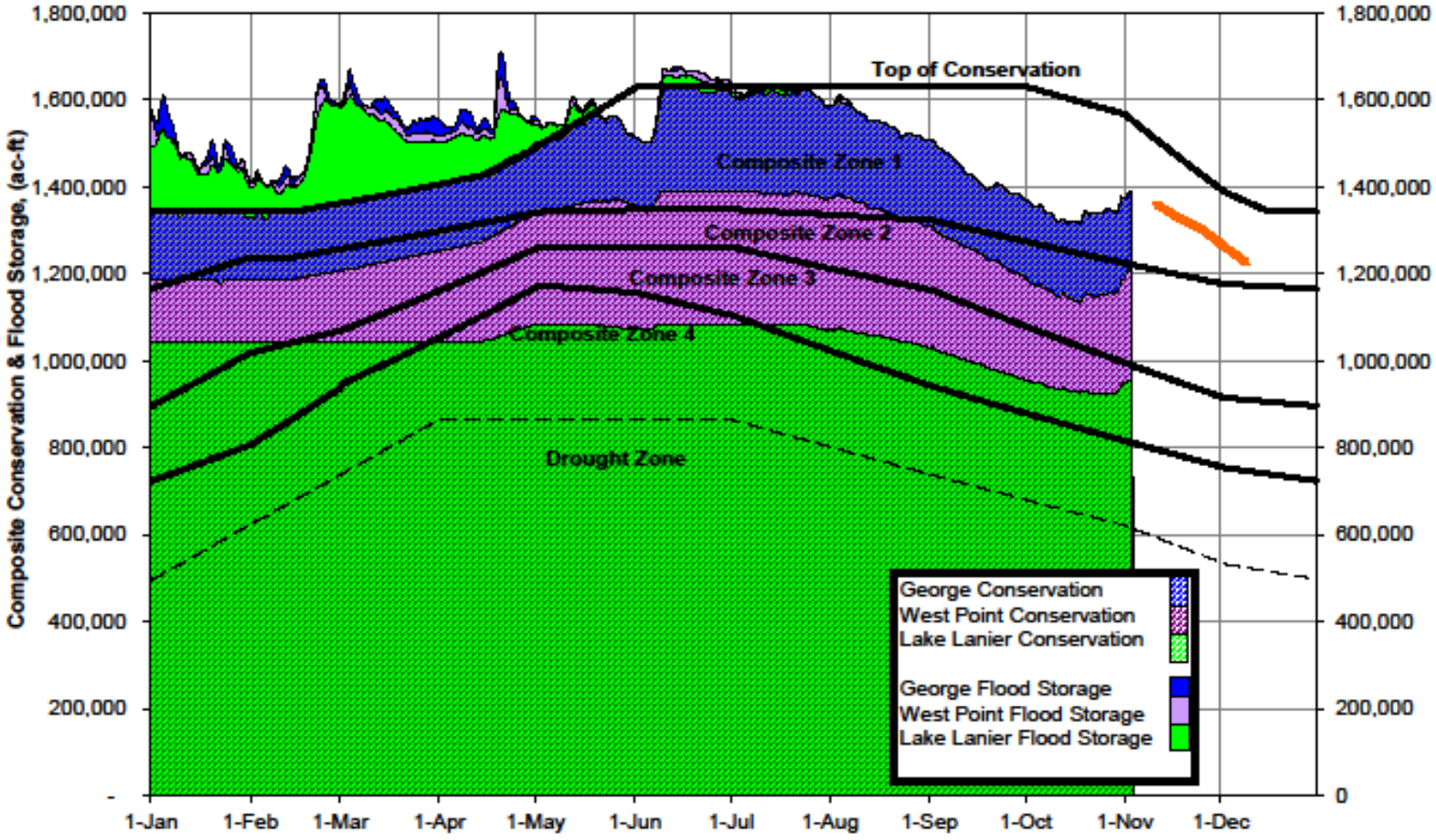
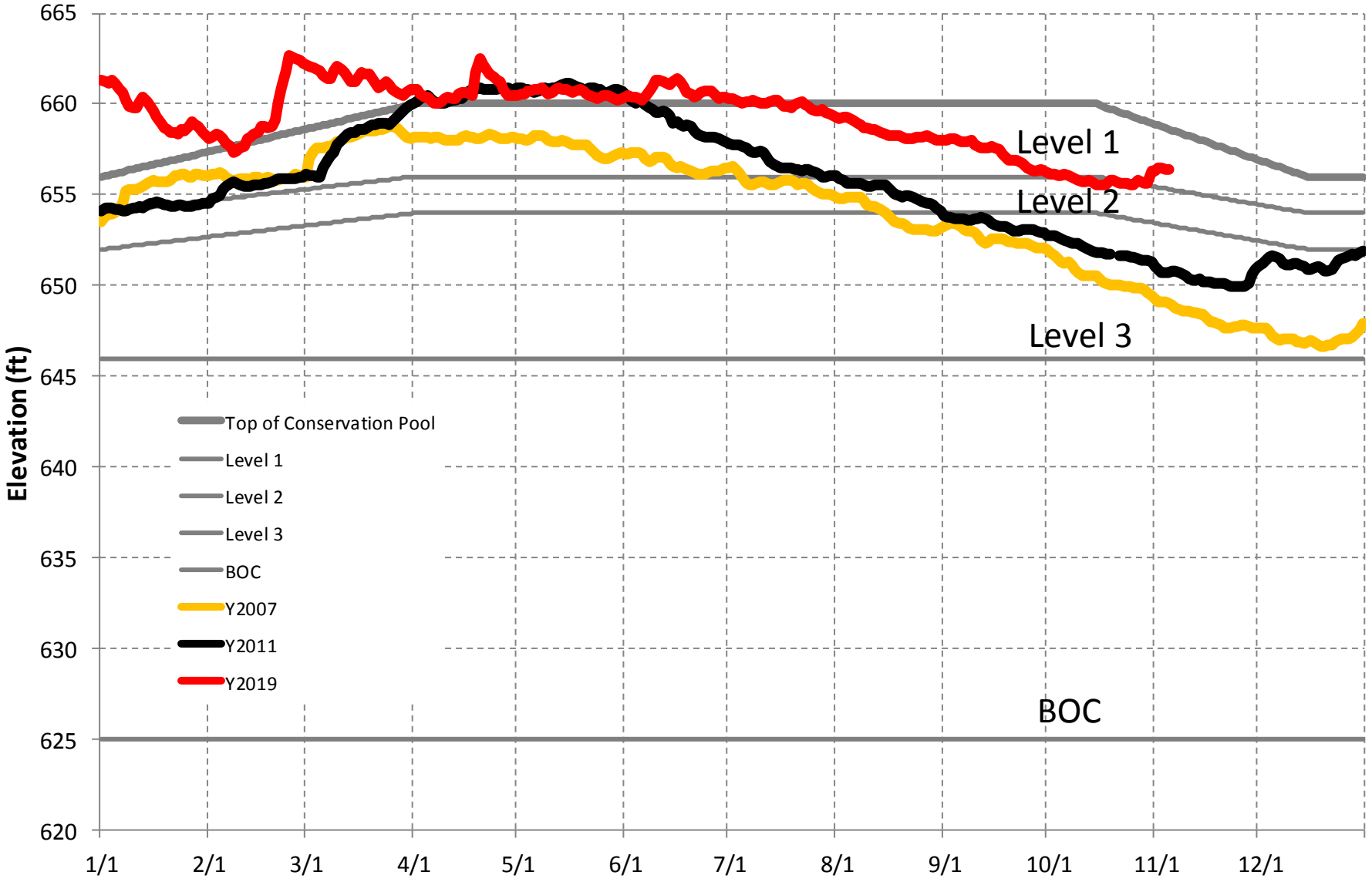
## 2019 ACF Basin Composite Conservation and Flood Storage




Actual data thru 11-01-2019

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

# LAKE HARTWELL ELEVATION

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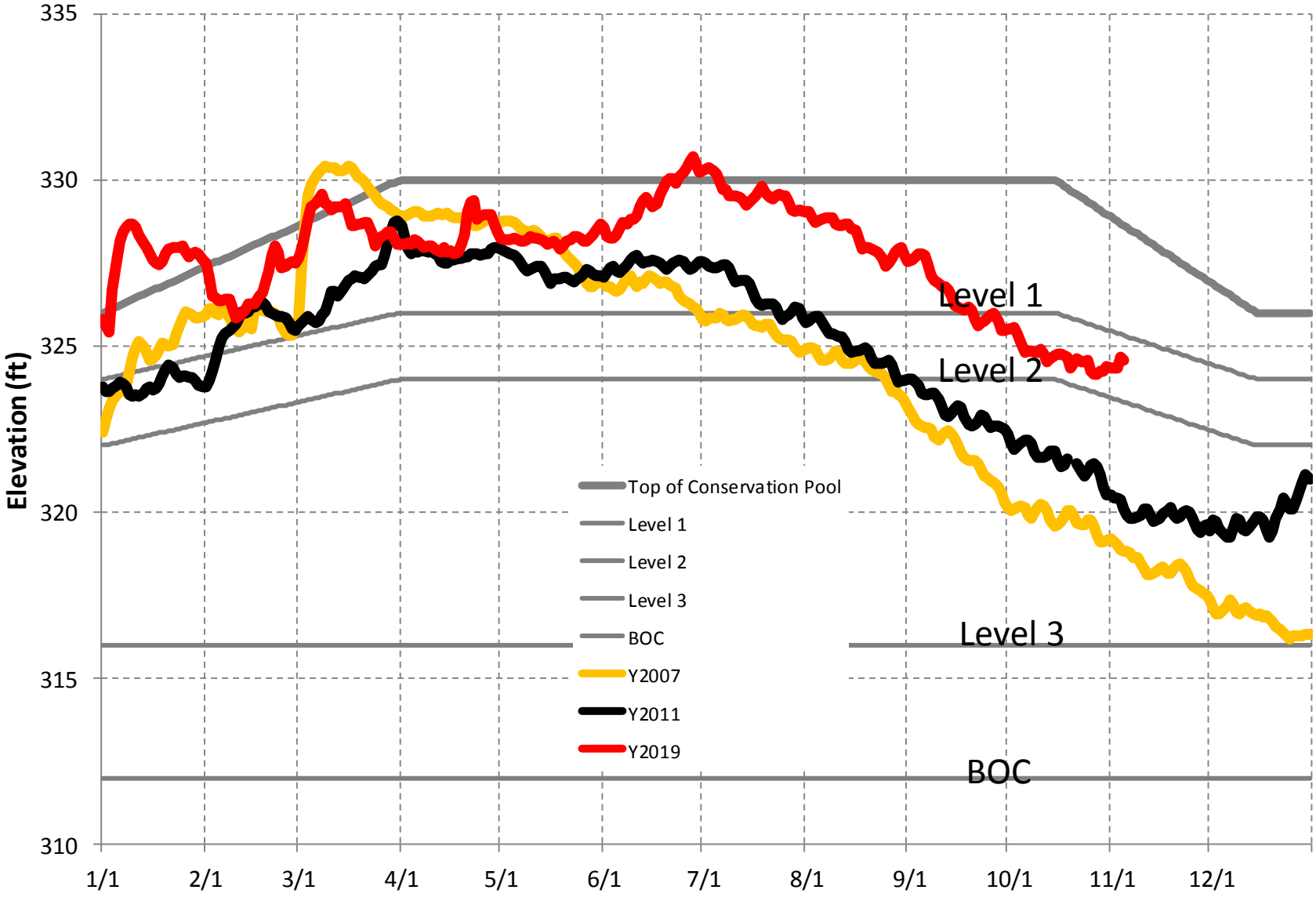
# LAKE CLARKS HILL (THURMOND) ELEVATION

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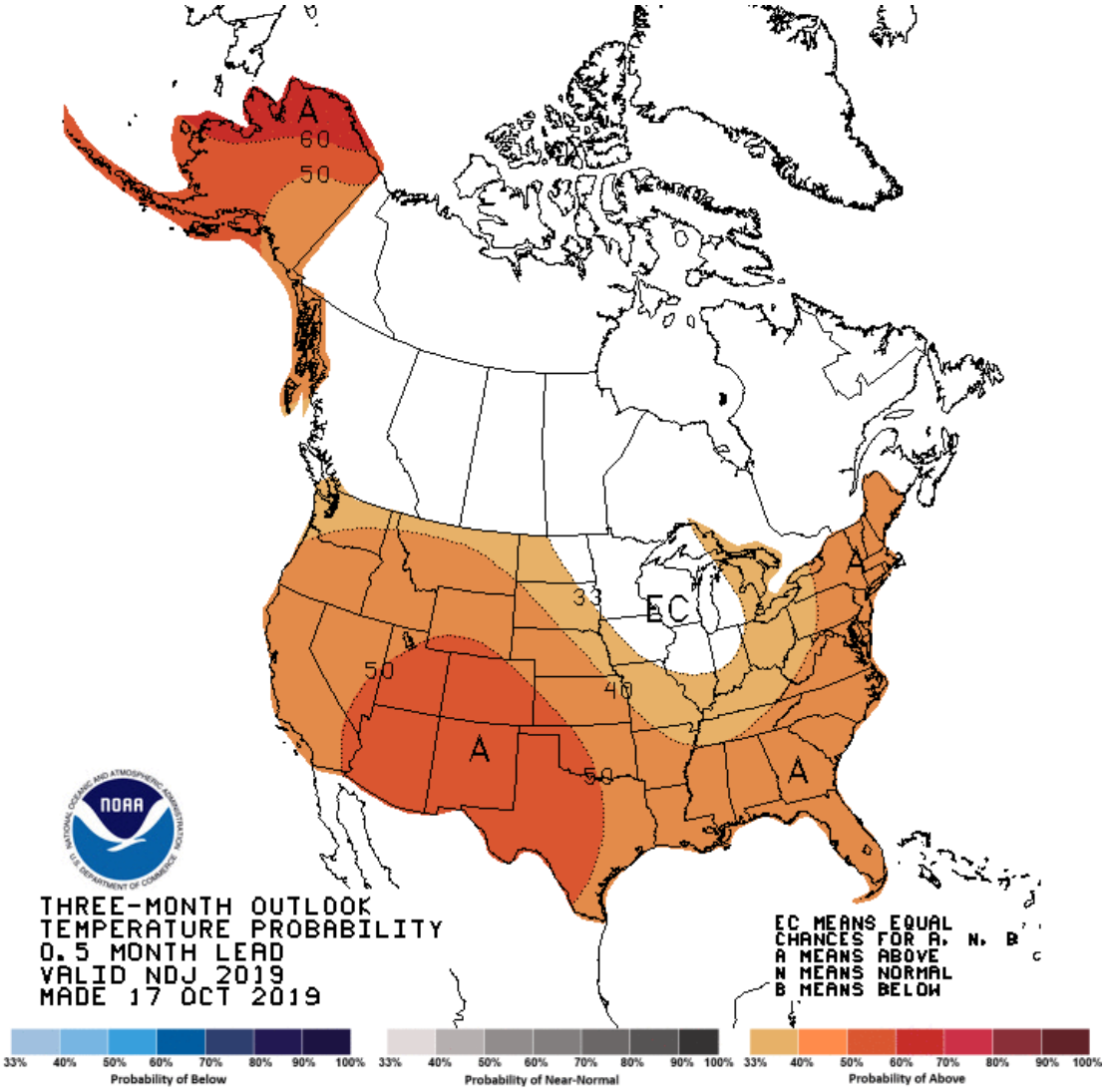
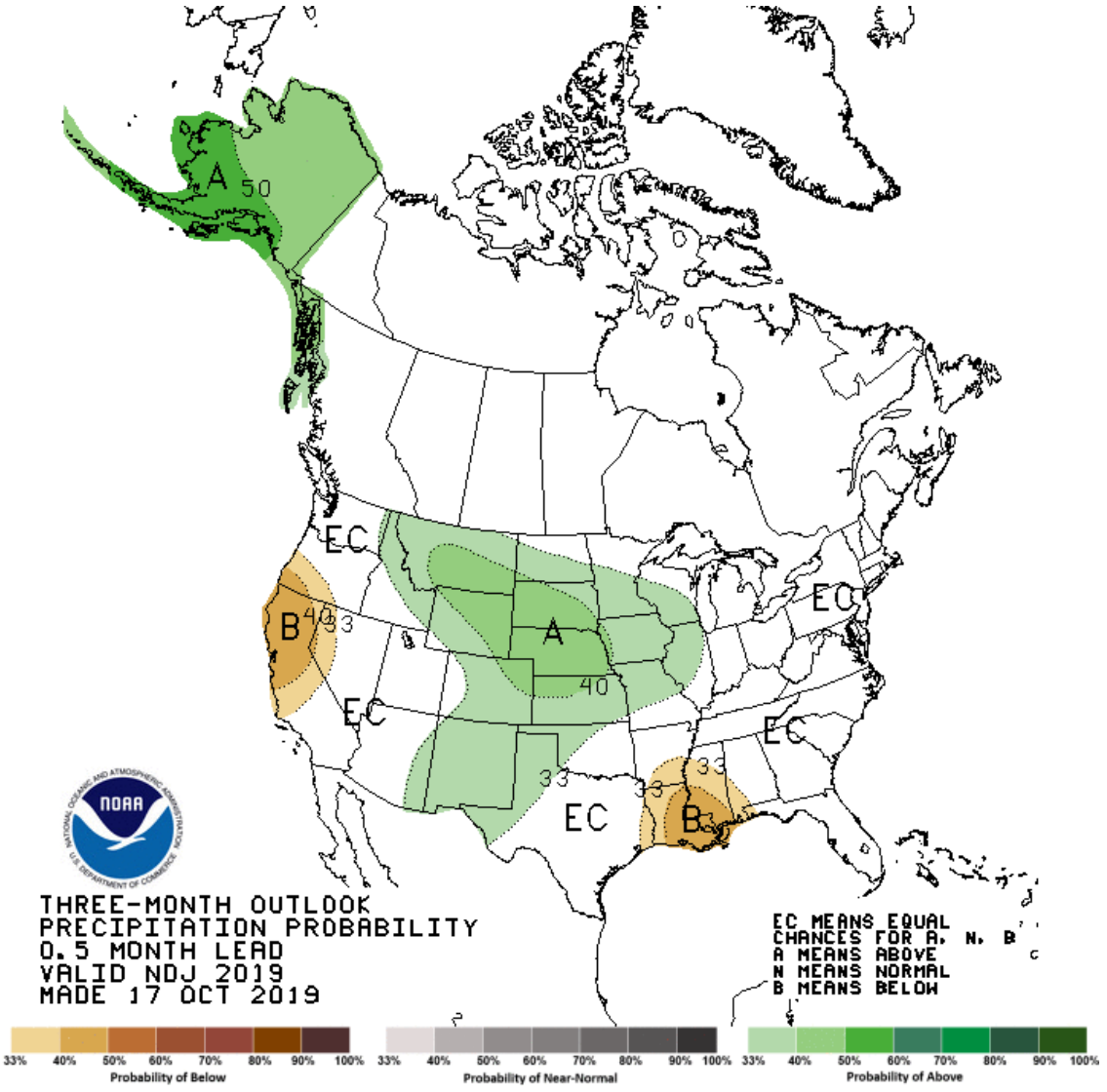
# Climate Prediction Center 3-month Temperature and Precipitation Probability Outlook and Seasonal Drought Outlook

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

# Temperature Outlook



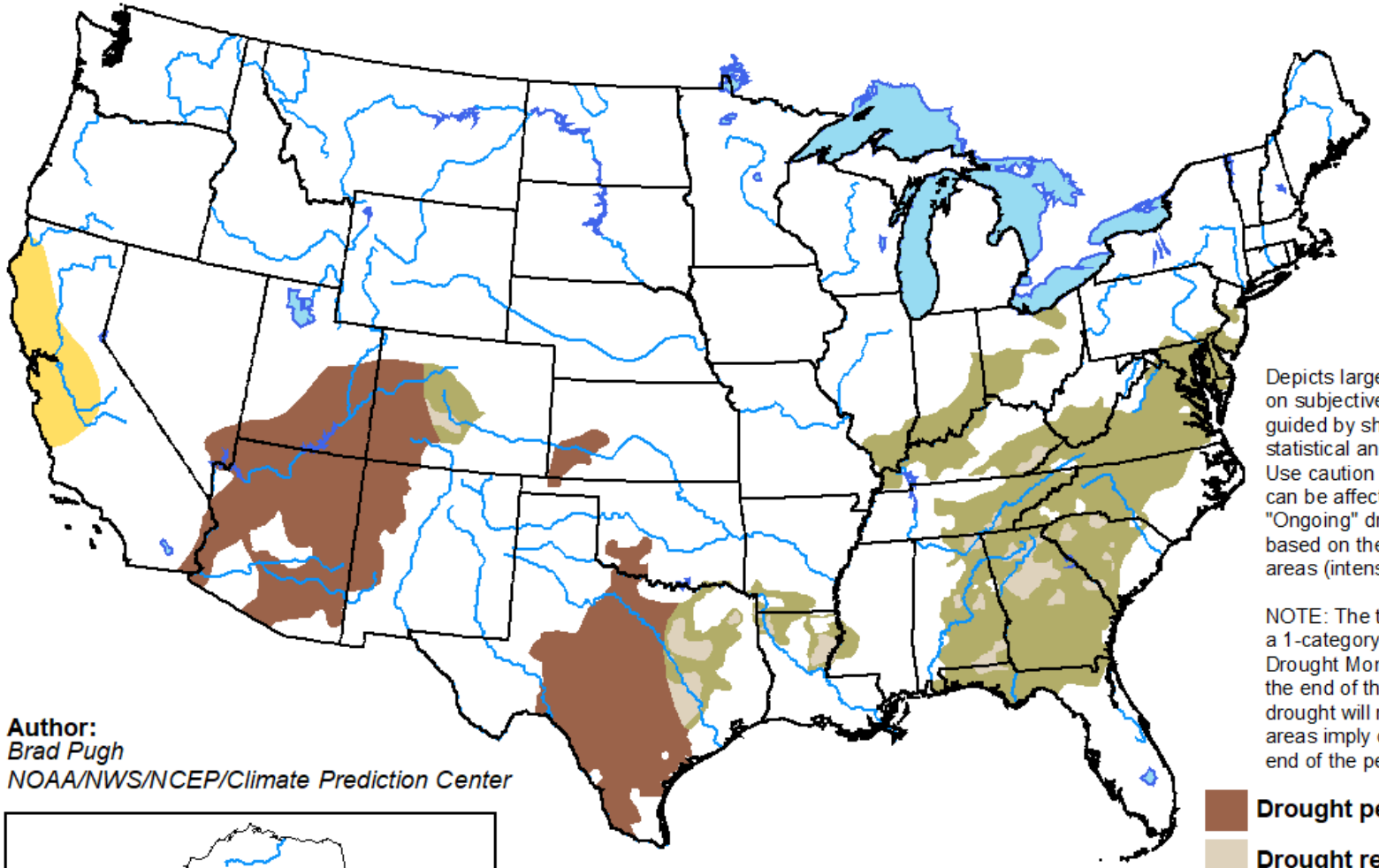
# Precipitation Outlook



# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

*Valid for October 17, 2019 - January 31, 2020*
*Released October 17, 2019*



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).

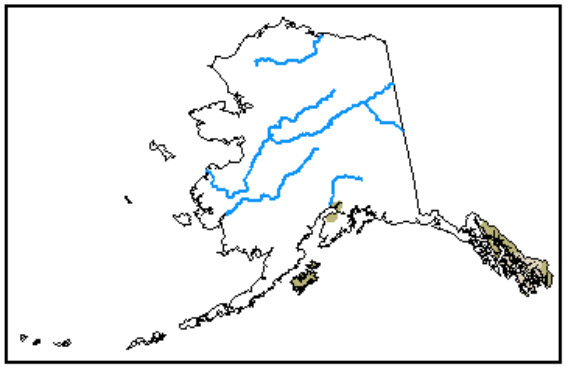
**Drought persists**

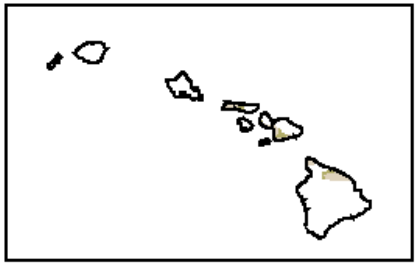
**Drought remains but improves**

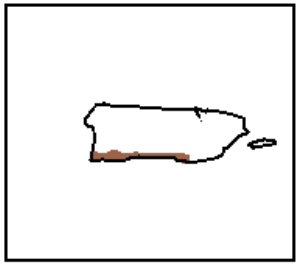
**Drought removal likely**

**Drought development likely**

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







**http://go.usa.gov/3eZ73**