# Drought Indicators Report

Georgia Environmental Protection Division

January 2017

# 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 may 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 January 17, 2017.

# Drought Indicator Analysis Summary (slide 1 of 2)

- **U.S. Drought Monitor** -- Extreme drought is in all or parts of 45 counties in the northern quarter of the state. Severe drought remains in an additional 42 counties north of the fall line. This week marks the 33rd week of continuous severe (or more intense) drought in northwest Georgia, the 31st week for the Atlanta metro area, the 30th week in parts of the northeast, the 24th week in central Georgia.

- **Precipitation --** The 3 month records show near normal to surplus amounts of rainfall in southwest and much of central Georgia, and the worst precipitation deficits of -6" to -12" are indicated in extreme north Georgia. The 6 month records also show areas north of the fall line with the worst deficits, up to -16" in extreme north-central and northeast Georgia. The 12 month records show near normal to a slight surplus of rainfall in southwest and southeast Georgia, while the greatest deficits still exist north of the fall line, in central Georgia, and parts of southeast Georgia.

- **Soil Moisture --** Soil moisture conditions north of a line from Carrolton to Atlanta to Lincolnton show abnormal to extreme dryness, while most areas south of that line show normal to exceptional wetness except a small area in southeast Georgia.

- **Streamflow** – Half of the observation sites are at or below 2007 and/or 2011 levels. Fourteen gages show flows at or lower than the 5th percentile. Note that this report reflects data through the end of December and does not capture changes due to early January rainfall.

# Drought Indicator Analysis Summary (slide 2 of 2)

- **Groundwater** – Ten of the 14 of the monitoring wells EPD uses to track drought conditions are below median levels. Ten are above the 20th percentile and two are below the 5th percentile of the historical record. Note that this report reflects data through the end of December and does not capture changes due to early January rainfall.

- **Reservoir Levels** – In the ACT, Allatoona is at winter guide curve and Carters Lake remains in zone 2, both are forecasted to stabilize. ACF inflows remain at levels that the Corps is not currently relying on storage to meet the 5000cfs low flow requirement at Woodruff Dam. In the ACF, Lanier is in zone 3 and is forecasted to go into zone 4, WestPoint and George both remain above winter guide curve due to the recent rains. ACF composite basin storage is in zone 2 but is forecasted to stabilize back into zone 3. In the Savannah Basin, both Hartwell and Thurmond are in level 3 and remain in Corps drought level 2 operations.

- **Short Term Climate Prediction** – Drought conditions in Georgia are predicted to persist.

- **Water Supplies** – The full range of systems, including those that rely on large reservoirs and rivers are closely watching their drought contingency plan triggers as well as the ongoing response of local water sources. A total of eight drought variances have been granted to date.

# US Drought Monitor

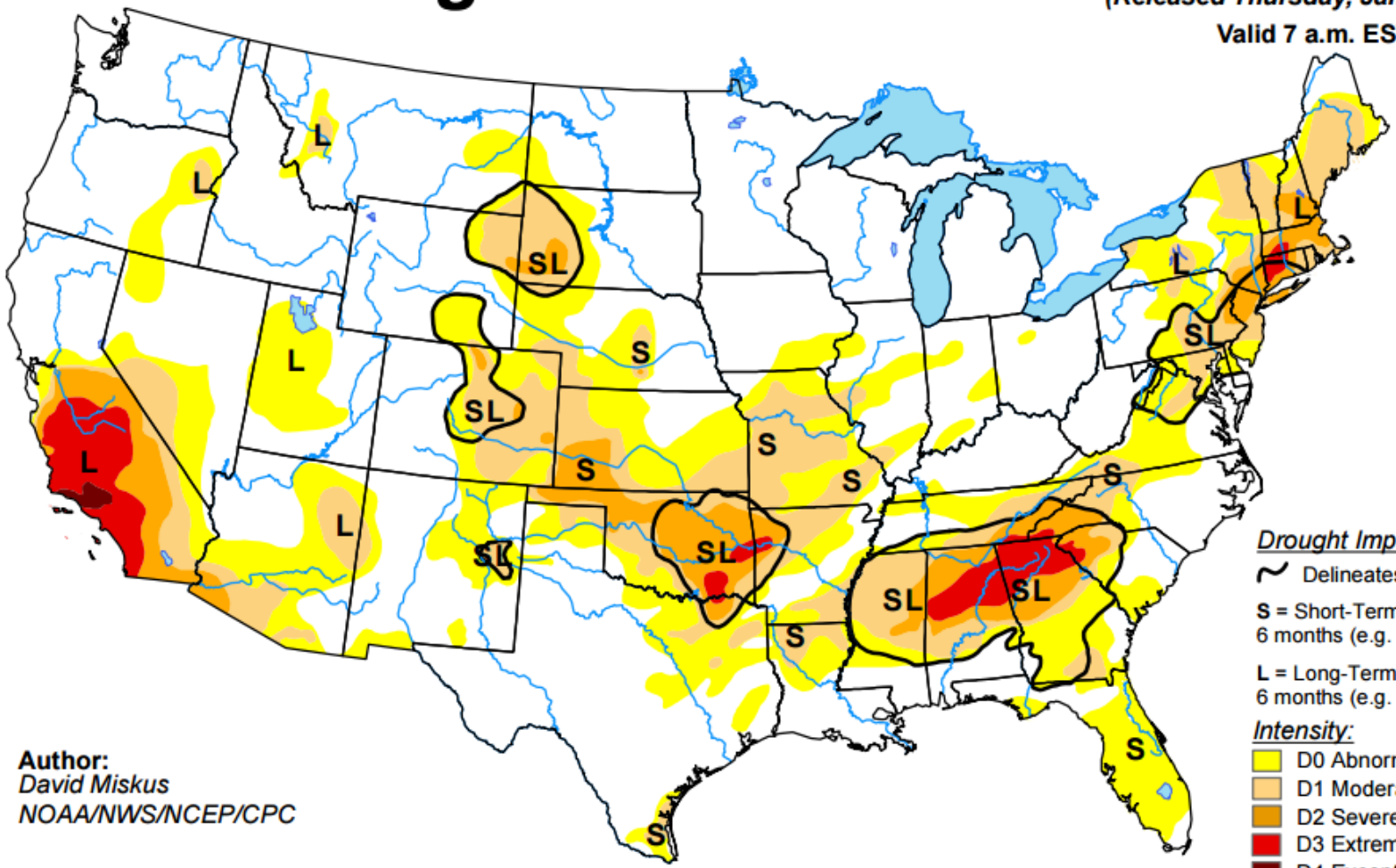
Data Source:
http://droughtmonitor.unl.edu/

# U.S. Drought Monitor

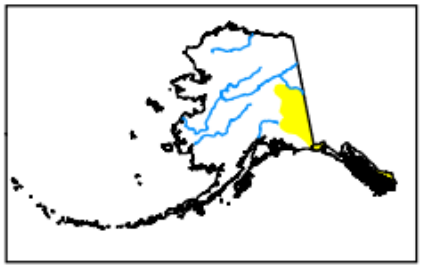
**January 10, 2017**

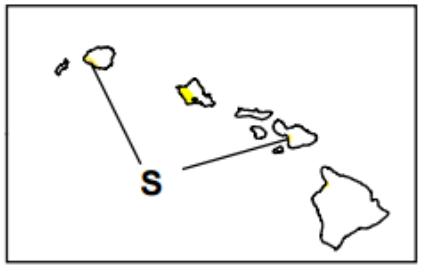
*(Released Thursday, Jan. 12, 2017)*

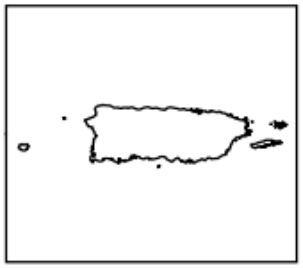
Valid 7 a.m. EST




**Author:**
*David Miskus*
*NOAA/NWS/NCEP/CPC*





*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:*

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

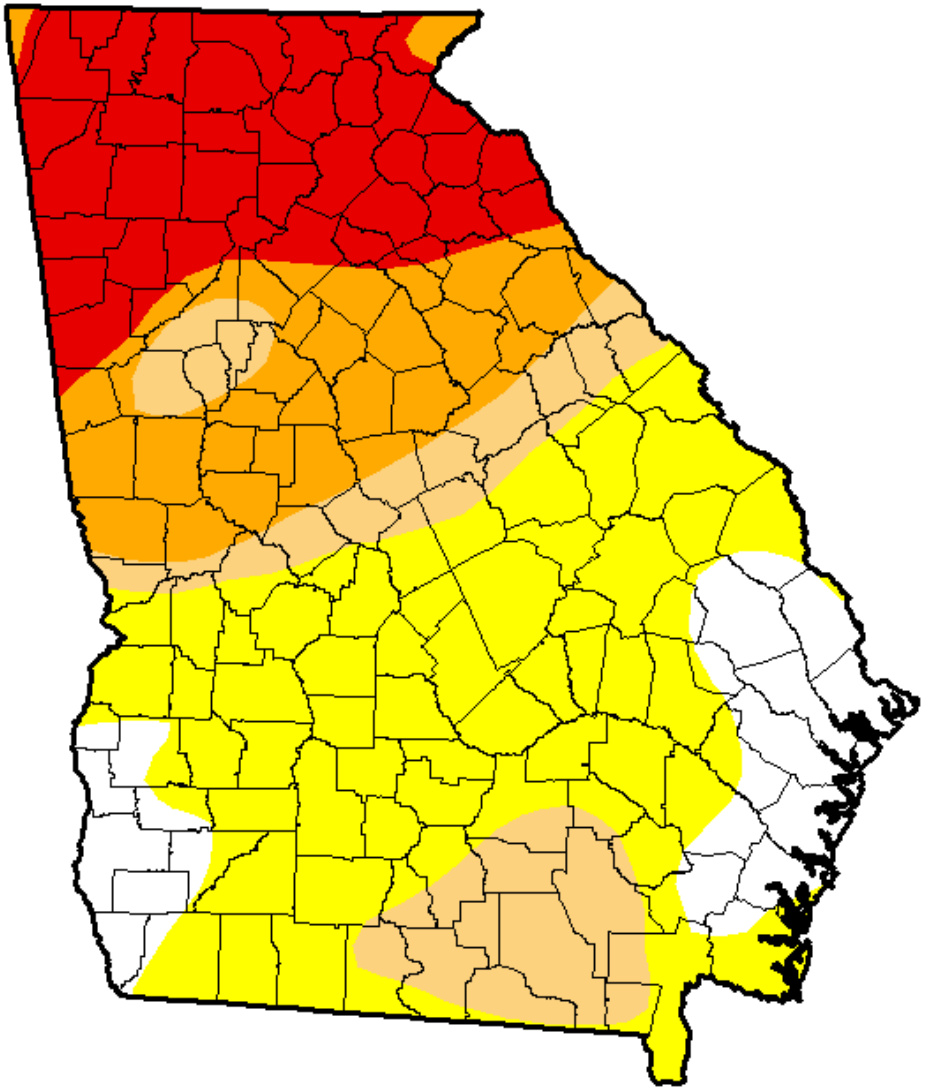
*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

USDA

National Drought Mitigation Center

**http://droughtmonitor.unl.edu/**

# U.S. Drought Monitor
# Georgia



## January 10, 2017
*(Released Thursday, Jan. 12, 2017)*
Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| **Current** | 11.44 | 88.56 | 48.34 | 34.43 | 19.28 | 0.00 |
| **Last Week** *1/3/2017* | 11.31 | 88.69 | 73.48 | 39.33 | 19.28 | 0.00 |
| **3 Months Ago** *10/11/2016* | 38.04 | 61.96 | 55.33 | 42.63 | 23.12 | 3.61 |
| **Start of Calendar Year** *1/3/2017* | 11.31 | 88.69 | 73.48 | 39.33 | 19.28 | 0.00 |
| **Start of Water Year** *9/27/2016* | 35.37 | 64.63 | 45.84 | 34.50 | 14.67 | 1.58 |
| **One Year Ago** *1/12/2016* | 87.36 | 12.64 | 0.00 | 0.00 | 0.00 | 0.00 |

*Intensity:*

- 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.*

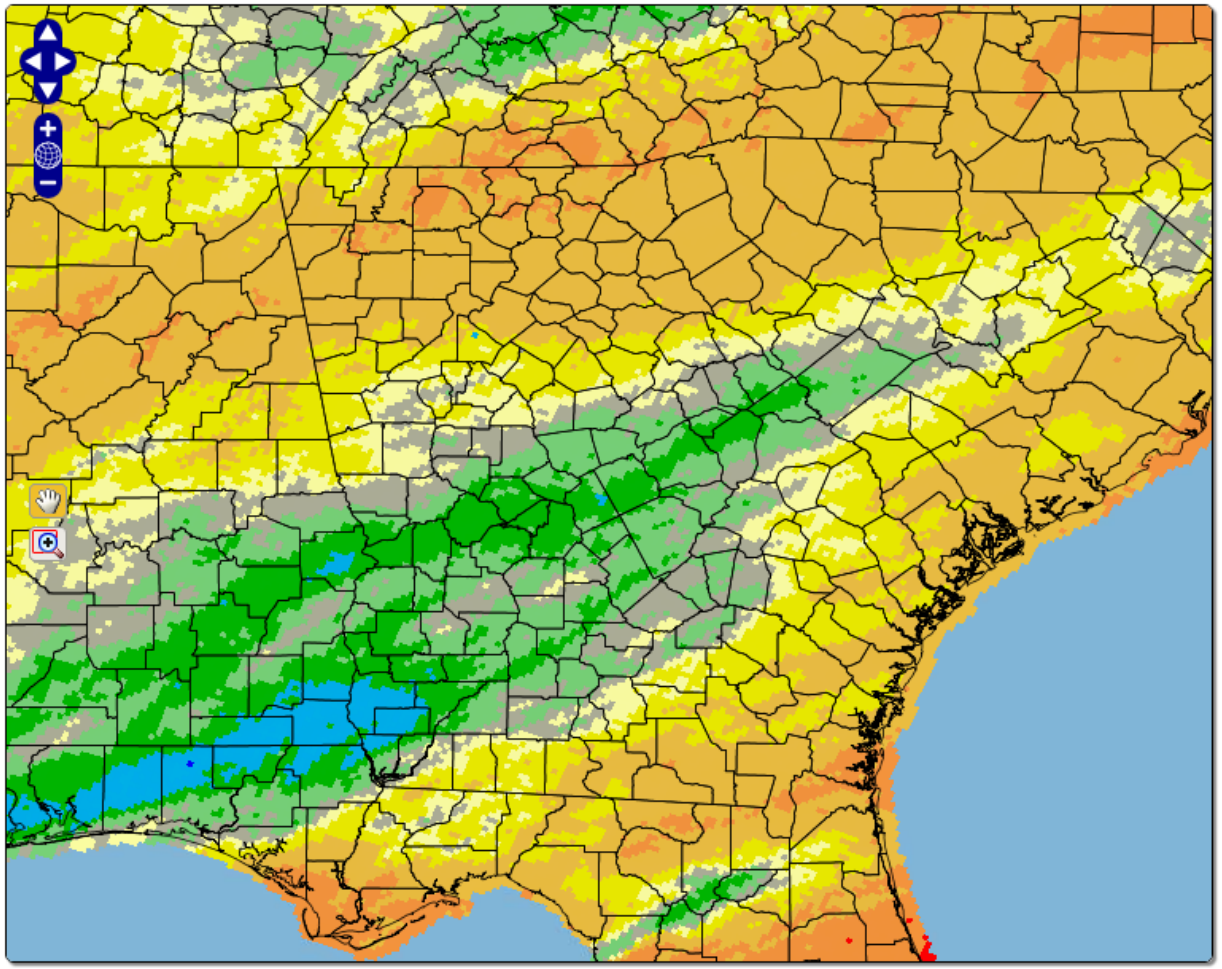
**Author:**
*David Miskus*
*NOAA/NWS/NCEP/CPC*

**http://droughtmonitor.unl.edu/**

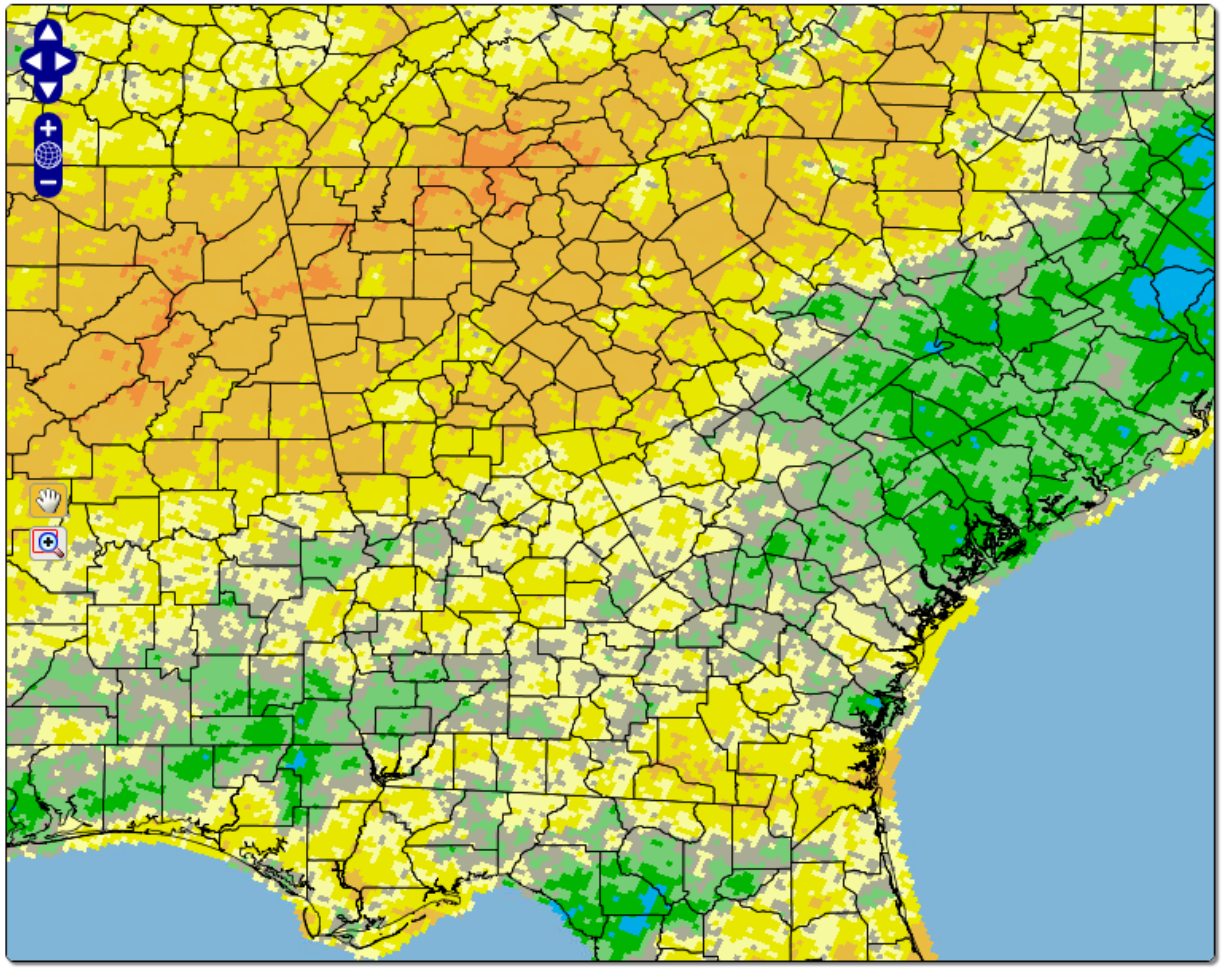
# 3, 6, and 12 Month
# Percent of Normal Precipitation

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

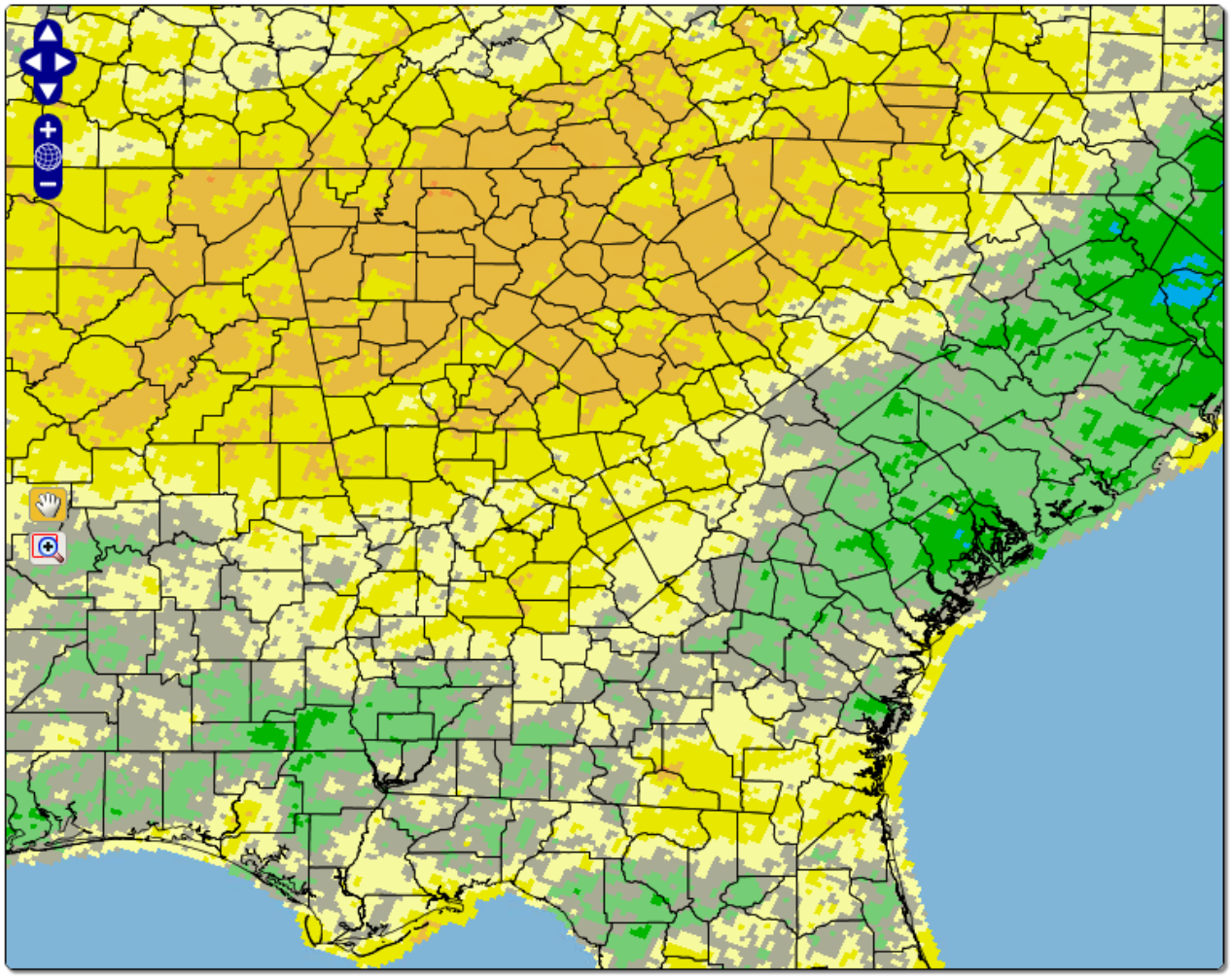
# 3 Month Percent of Normal Precipitation



# 6 Month Percent of Normal Precipitation

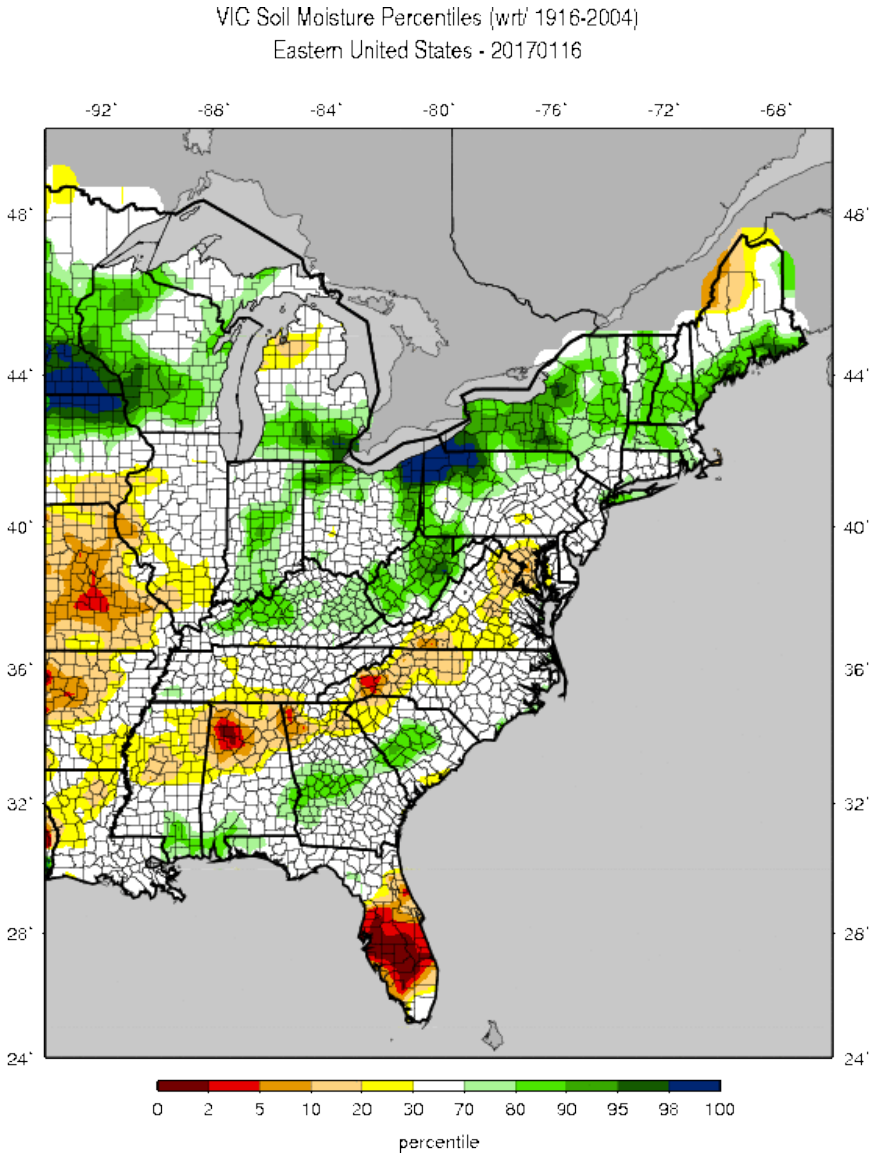


# 12 Month Percent of Normal Precipitation



# Soil Moisture Conditions

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



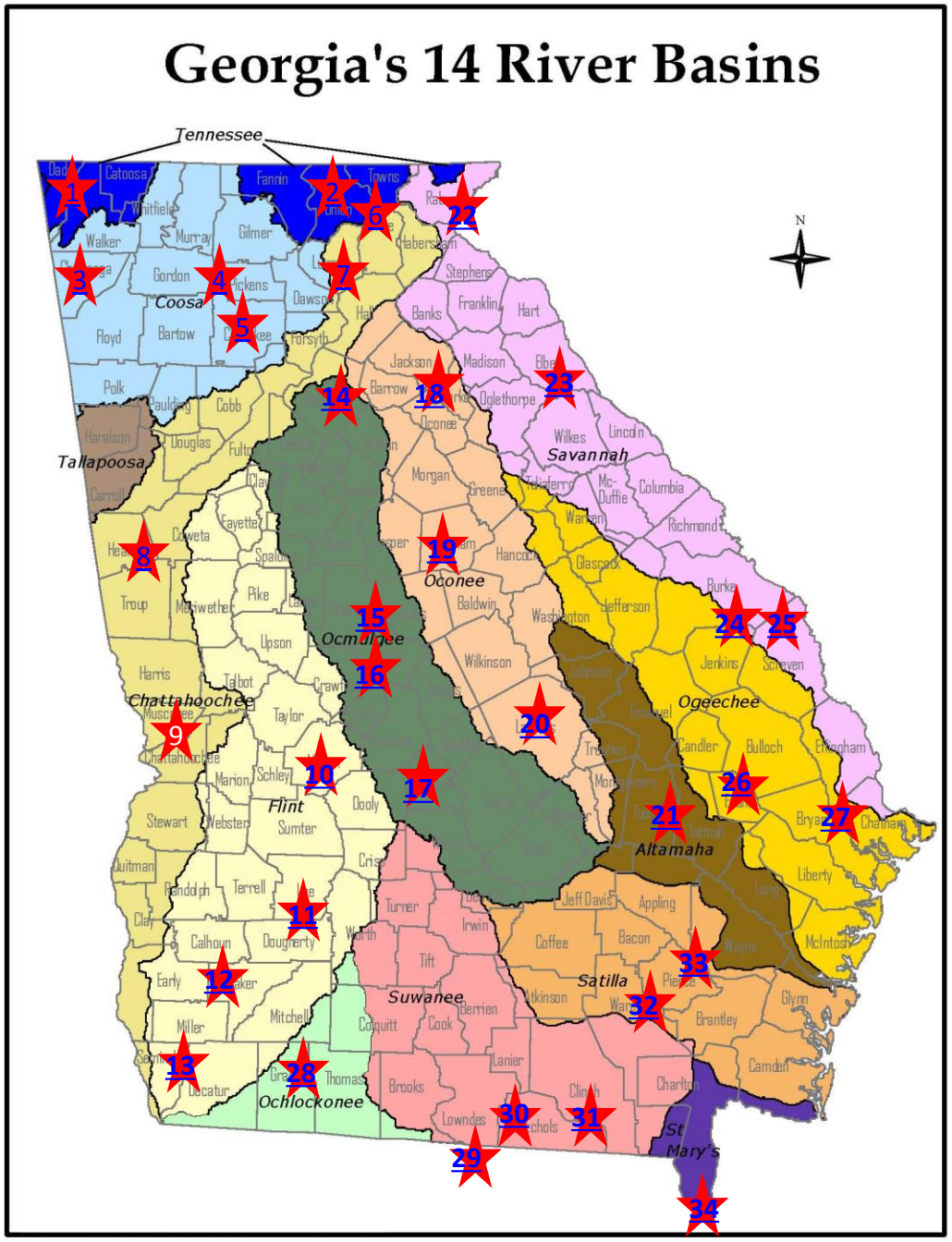

Current (daily updated) percentiles for soil moisture (SWE) with respect to the climatological period (1916-2004).

# 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, 2016 through December, 2016;
- 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**

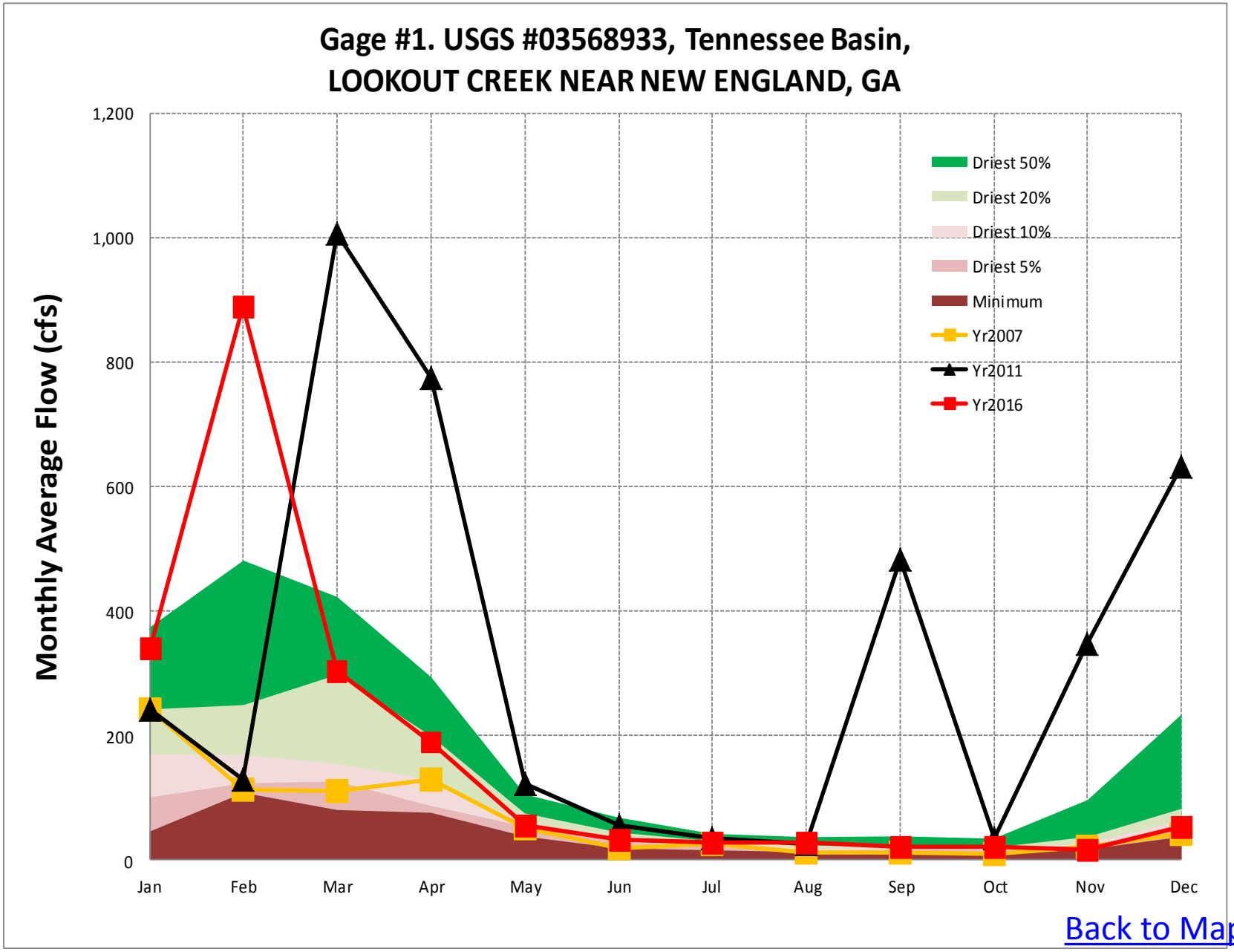
The streamflow graph for Gage #5, USGS Etowah River gage at Canton shows :

- Average stream flow for December 2016 was 358 cfs. The statistical composite of all historical data for this gage shows that average streamflow in December has historically been lower than December 2016 about 20% of the time; about 80% of the time in December it has been higher.
- Average stream flow in December 2011 was 790 cfs. The statistical composite of all historical data for this gage shows that average streamflow for December has historically been lower than December 2011 only 10% of the time; 90% of the time in December it has been higher.
- Average stream flow in December 2007 was 360 cfs. The statistical composite of all historical data for this gage shows that average streamflow for December has historically been lower than December 2007 only 5% of the time; 95% of the time in December 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 December 2016 was 2636 cfs. The statistical composite of all historical data for this gage shows that average streamflow in December has historically been lower than December 2016 about 20% of the time; about 80% of the time in December it has been higher.
- Average stream flow in December 2011 was 2100 cfs. The statistical composite of all historical data for this gage shows that average streamflow for December has historically been lower than December 2011 about 10% of the time; about 90% of the time in December it has been higher.
- Average stream flow in December 2007 was 2463 cfs. The statistical composite of all historical data for this gage shows that average streamflow for December has historically been lower than December 2007 about 10% of the time; about 90% of the time in December it has been higher.


Gage #1. USGS #03568933, Tennessee Basin,
LOOKOUT CREEK NEAR NEW ENGLAND, 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
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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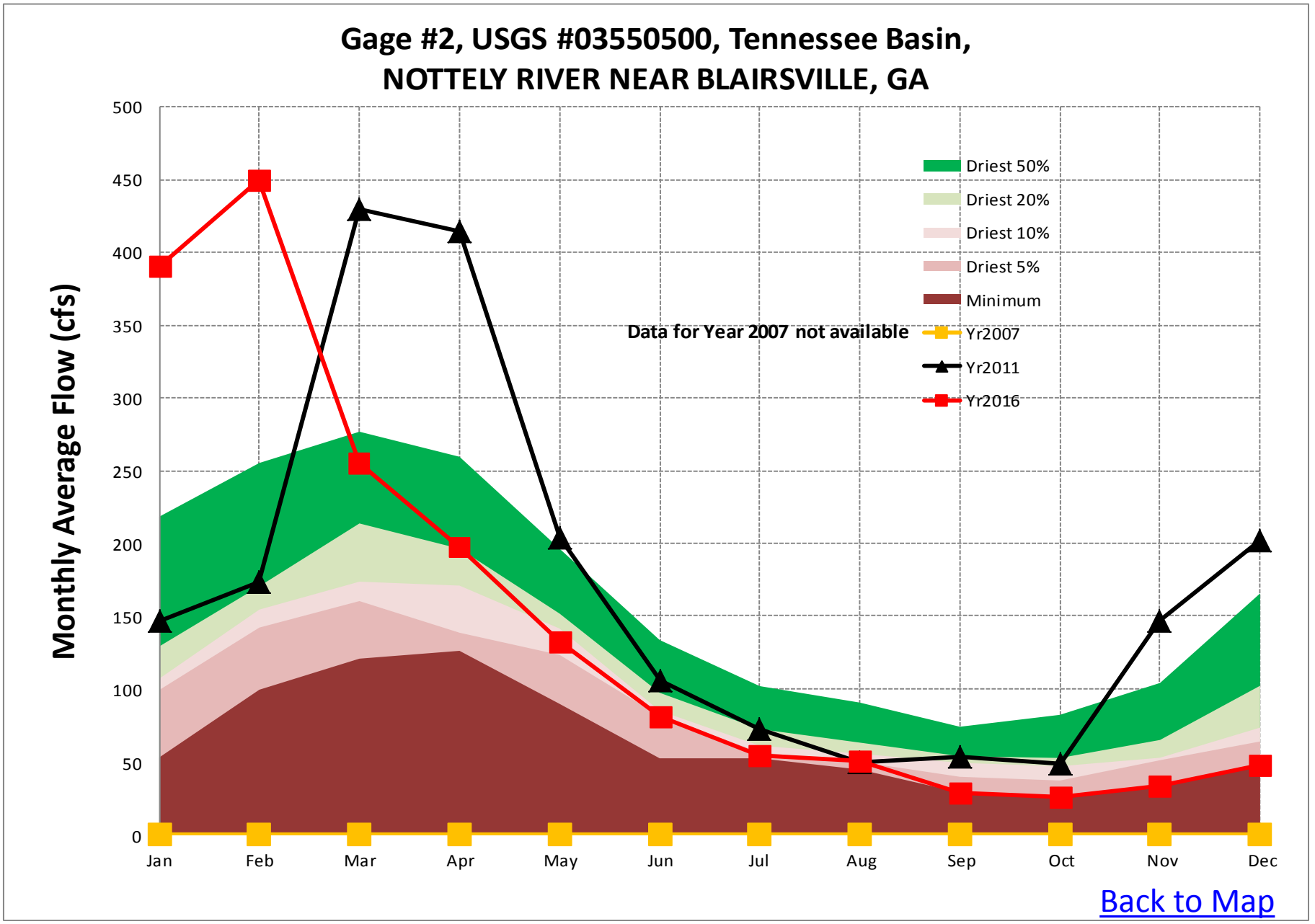
Gage #2, USGS #03550500, Tennessee Basin,
NOTTELY RIVER NEAR BLAIRSVILLE, GA
Monthly Average Flow (cfs)
500
450
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Data for Year 2007 not available
Yr2007
Yr2011
Yr2016

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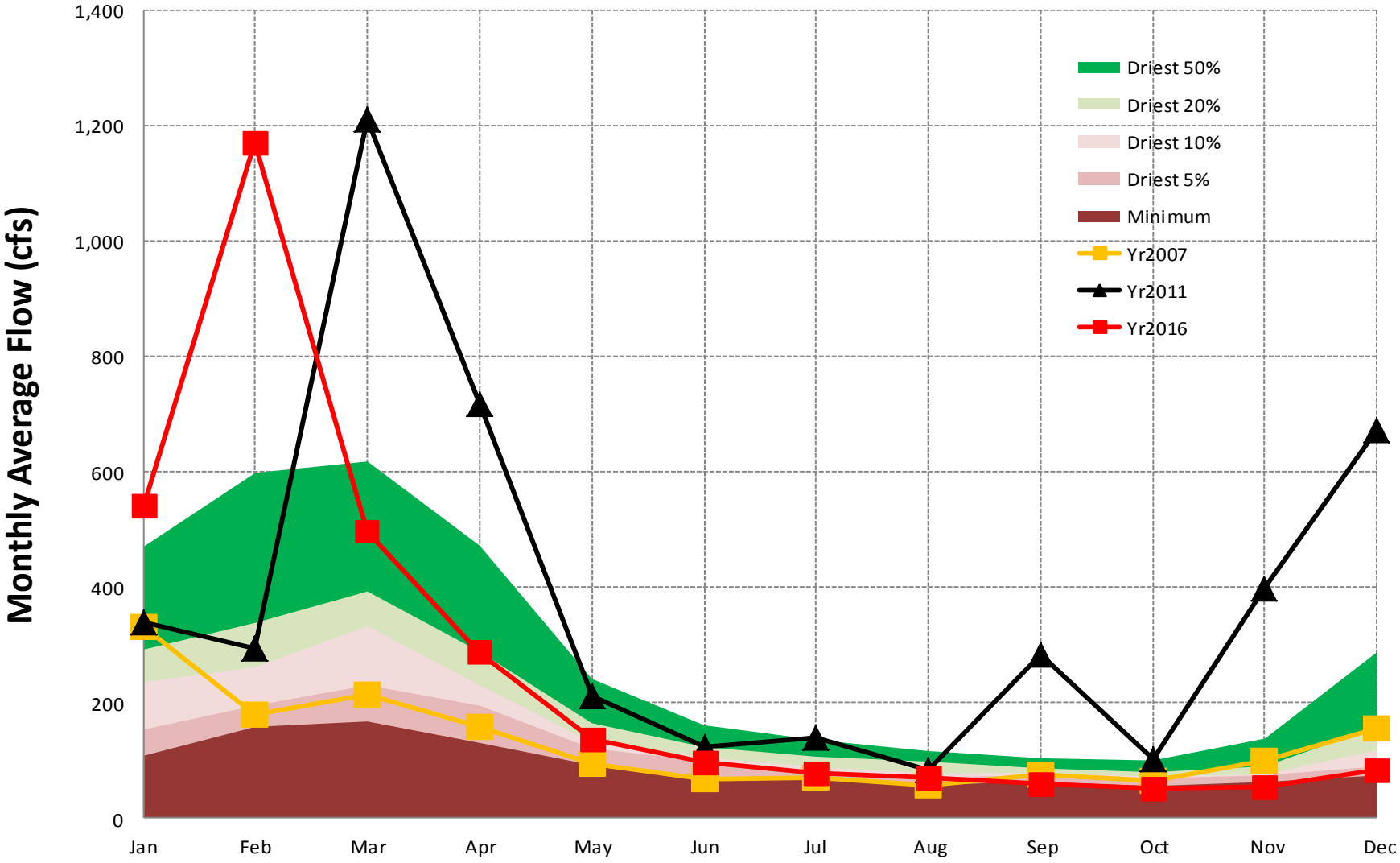
# Gage #3. USGS #02398000, Coosa Basin, Chattooga River at Summerville, GA

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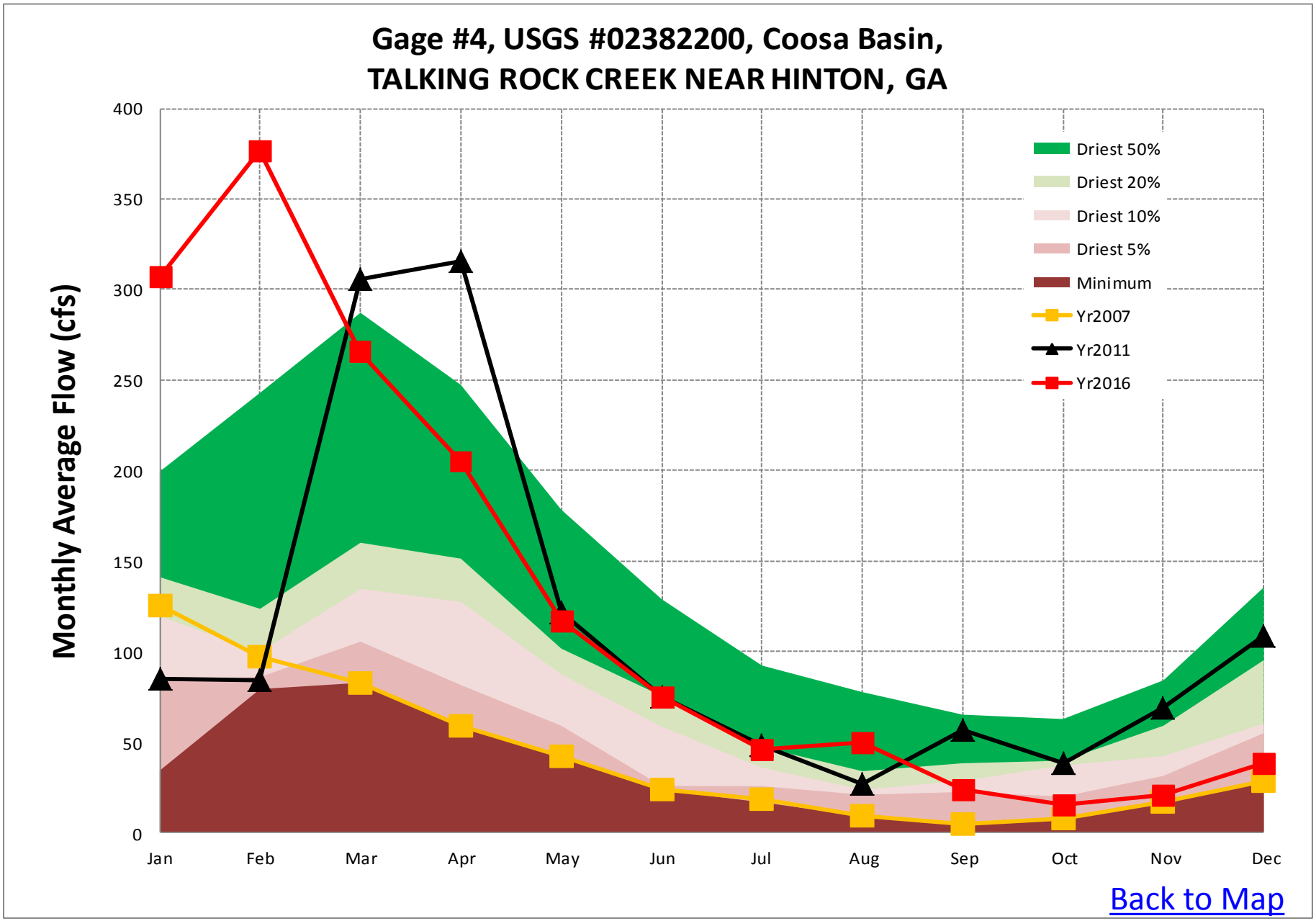
Gage #4, USGS #02382200, Coosa Basin,
TALKING ROCK CREEK NEAR HINTON, GA
Monthly Average Flow (cfs)
400
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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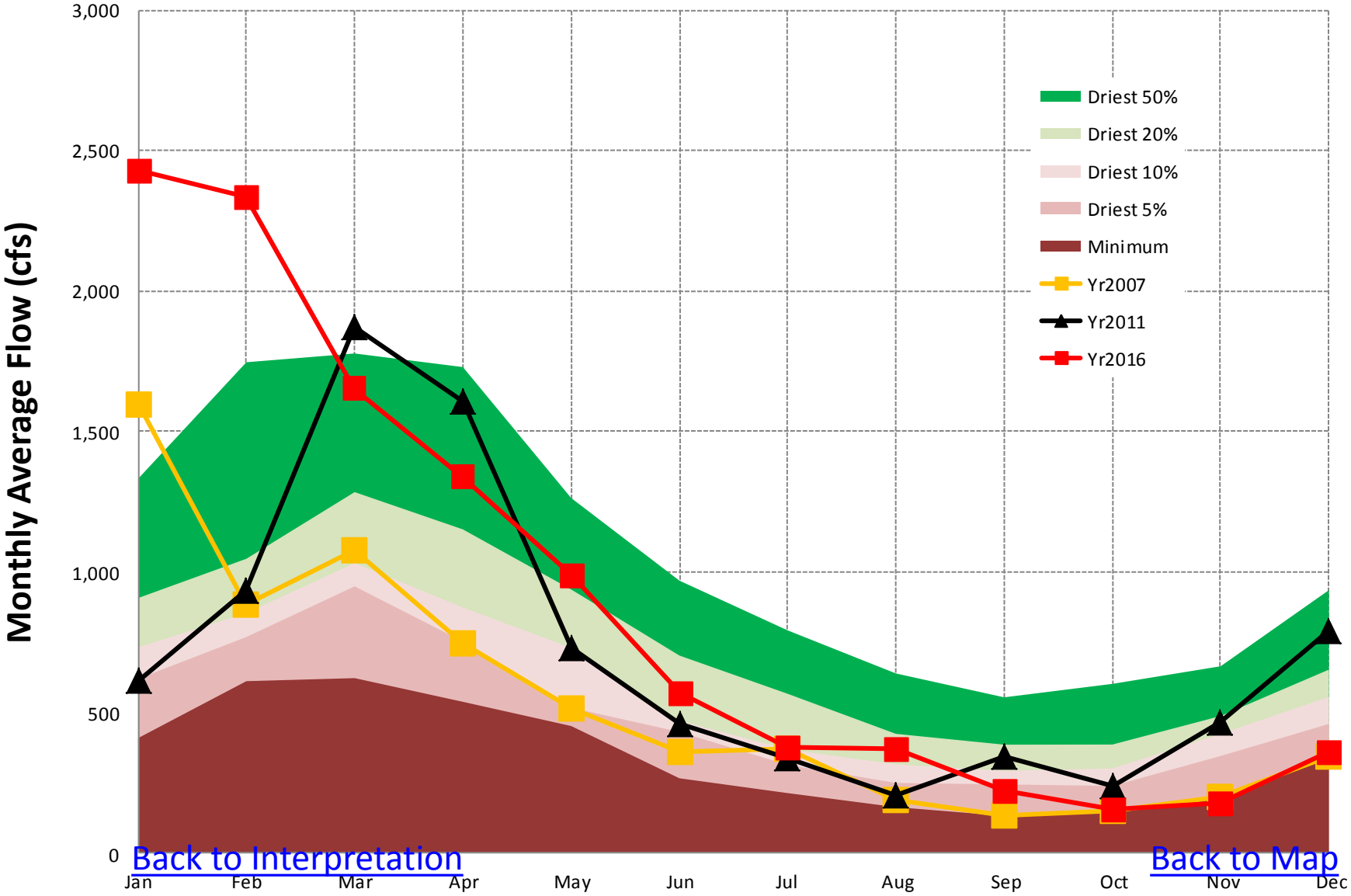
# Gage #5, USGS #02392000, Coosa Basin, Etowah River at Canton, GA

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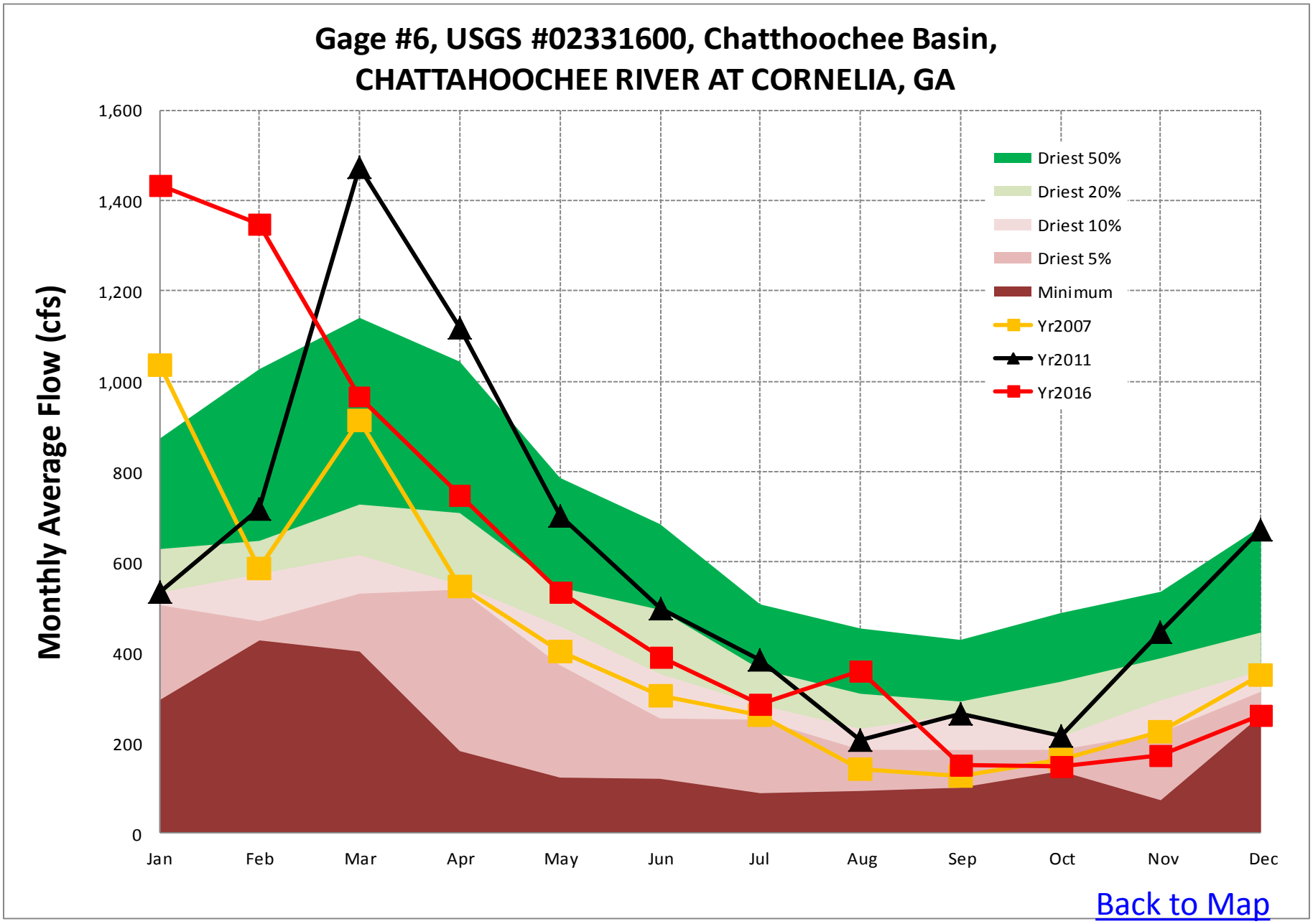
Gage #6, USGS #02331600, Chatthoochee Basin,
CHATTAHOOCHEE RIVER AT CORNELIA, GA
Monthly Average Flow (cfs)
1,600
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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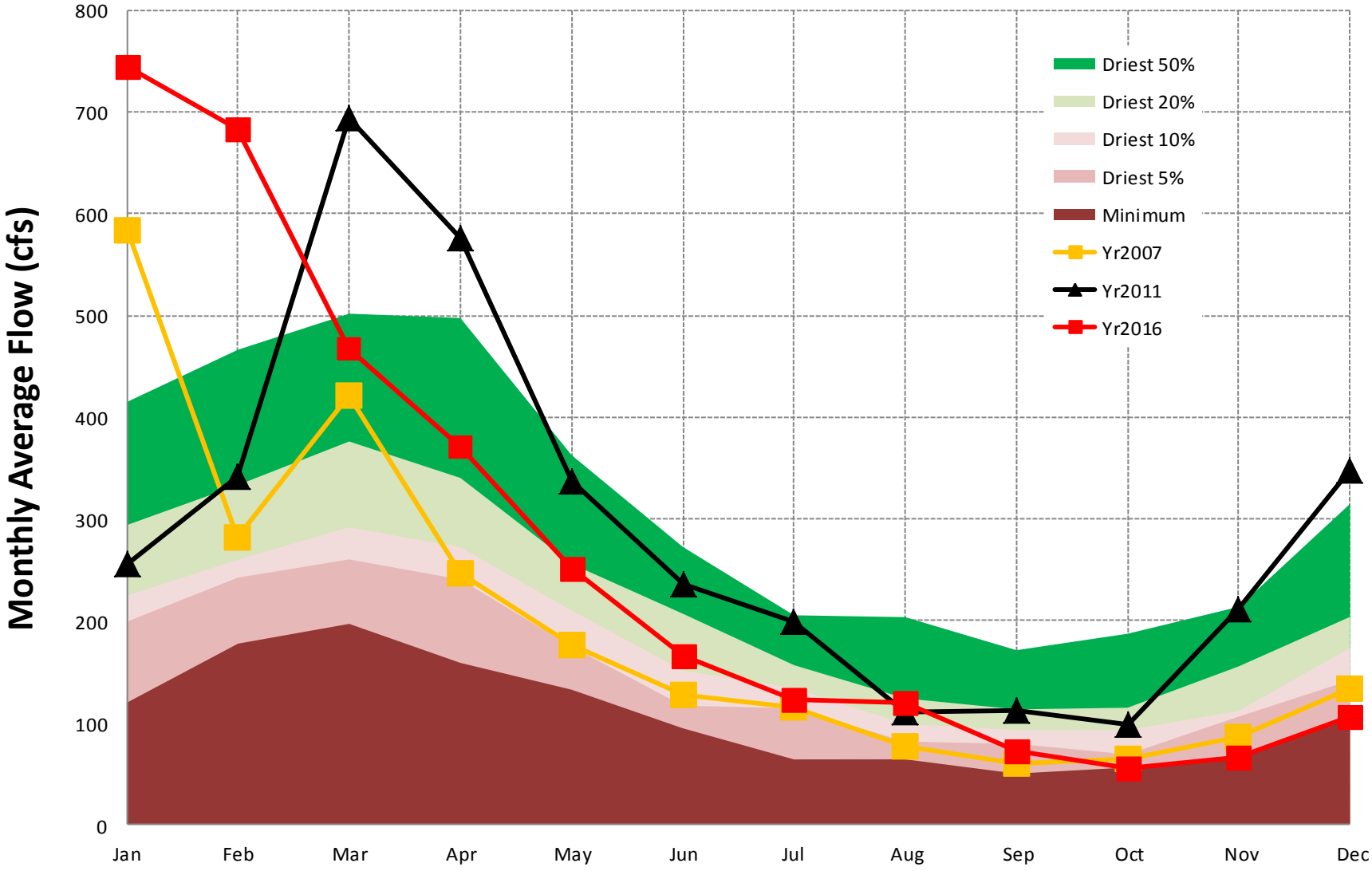
# Gage #7, USGS #02333500, Chatahoochee Basin, CHESTATEE RIVER NEAR DAHLONEGA, GA

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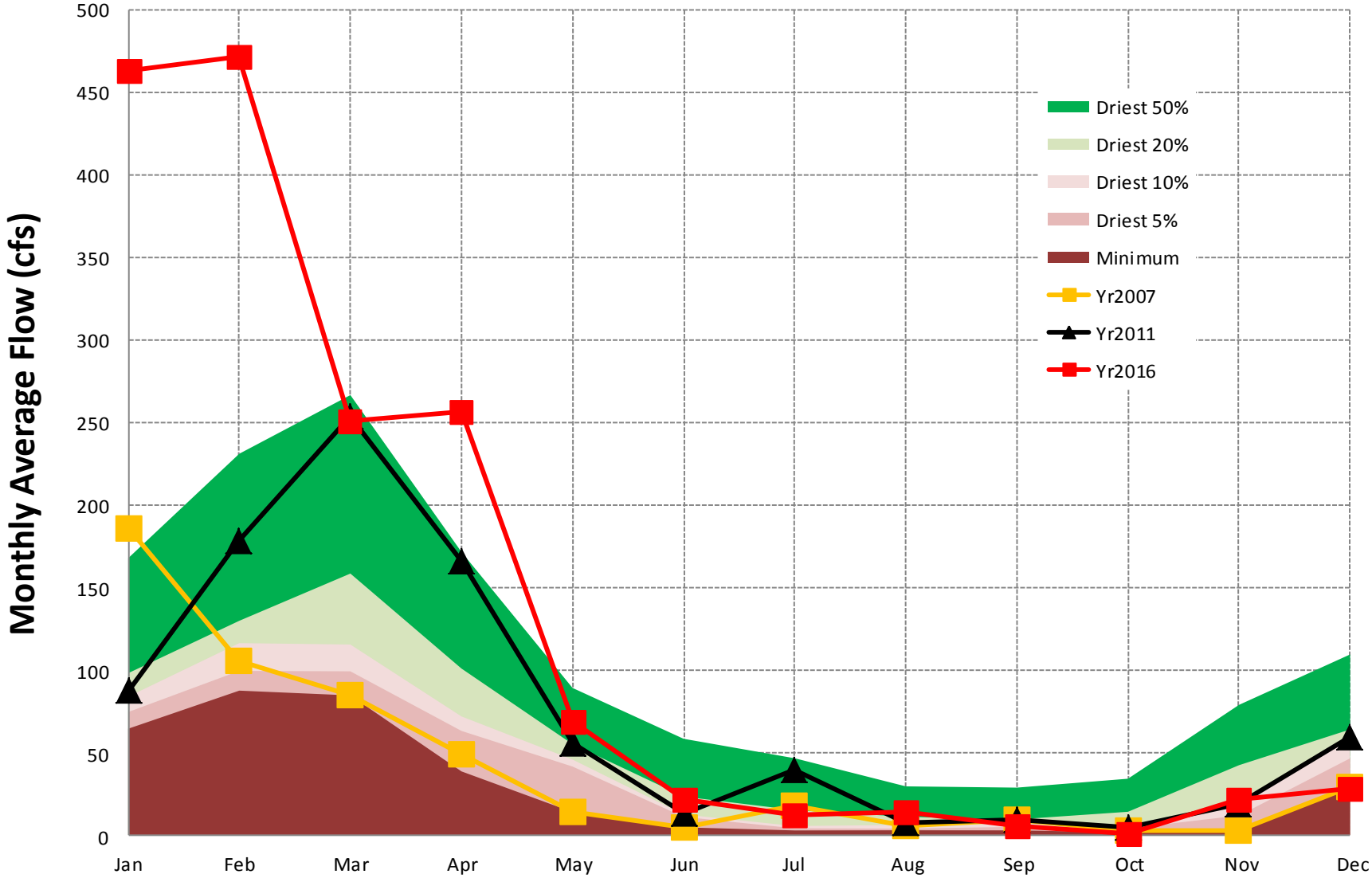
## Gage #8, USGS #02338660, Chattahoochee Basin, NEW RIVER AT GA 100, NEAR CORINTH

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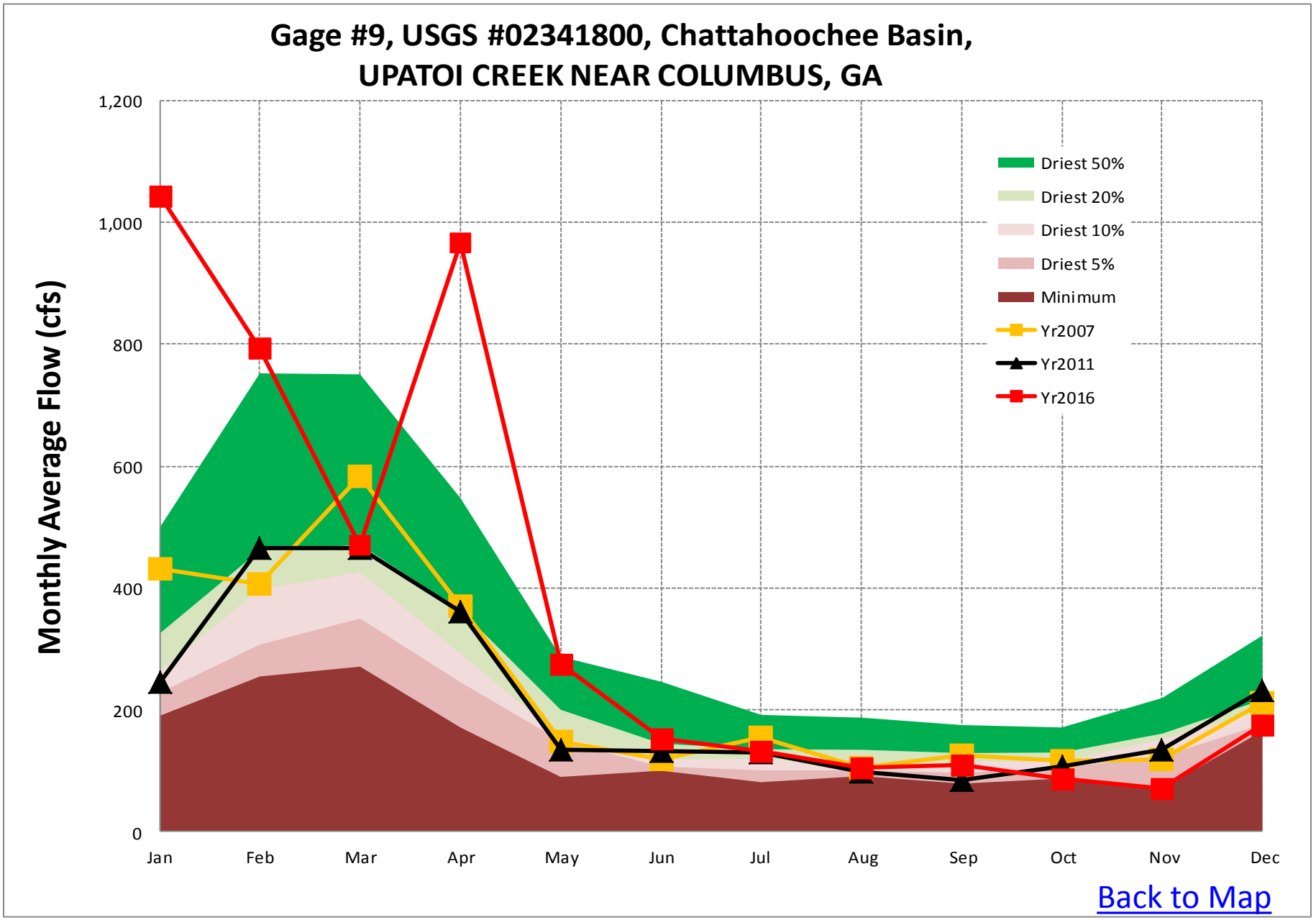
Gage #9, USGS #02341800, Chattahoochee Basin,
UPATOI CREEK NEAR COLUMBUS, GA
Monthly Average Flow (cfs)
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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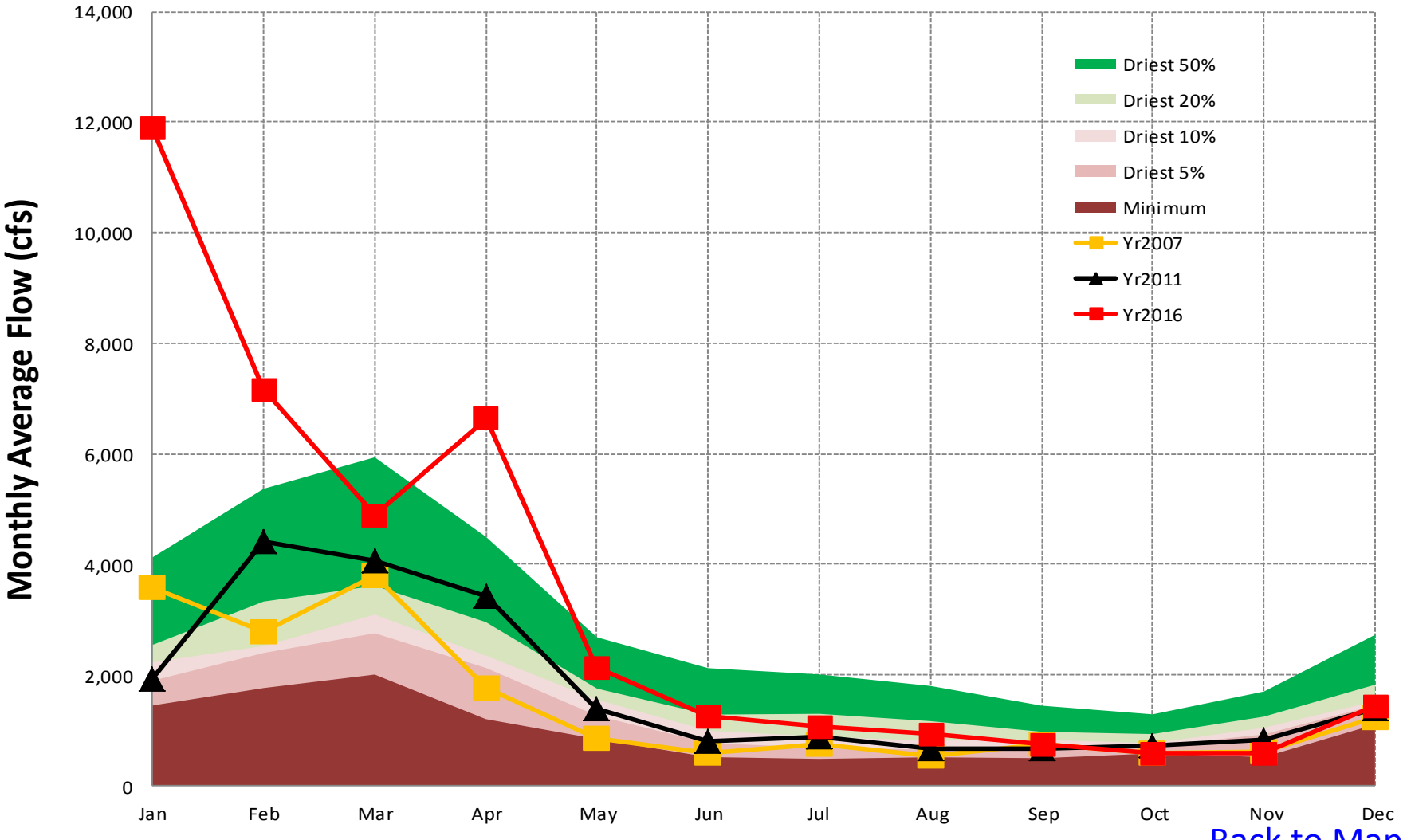
## Gage #10. USGS #02349605, Flint Basin, FLINT RIVER AT GA26 NEAR MONTEZUMA, GA

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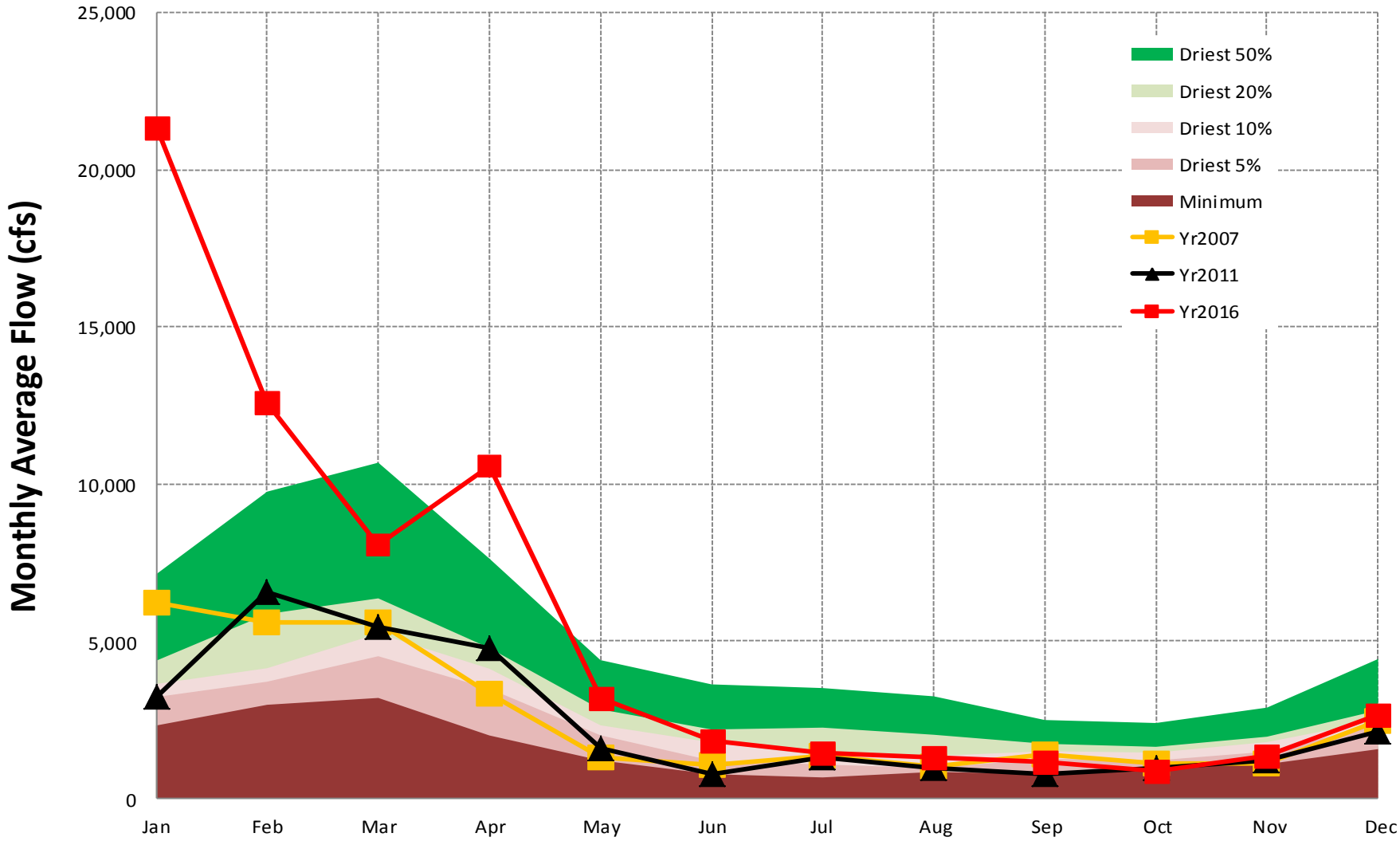
## Gage #11, USGS #02352500, Flint Basin, FLINT RIVER AT ALBANY, GA

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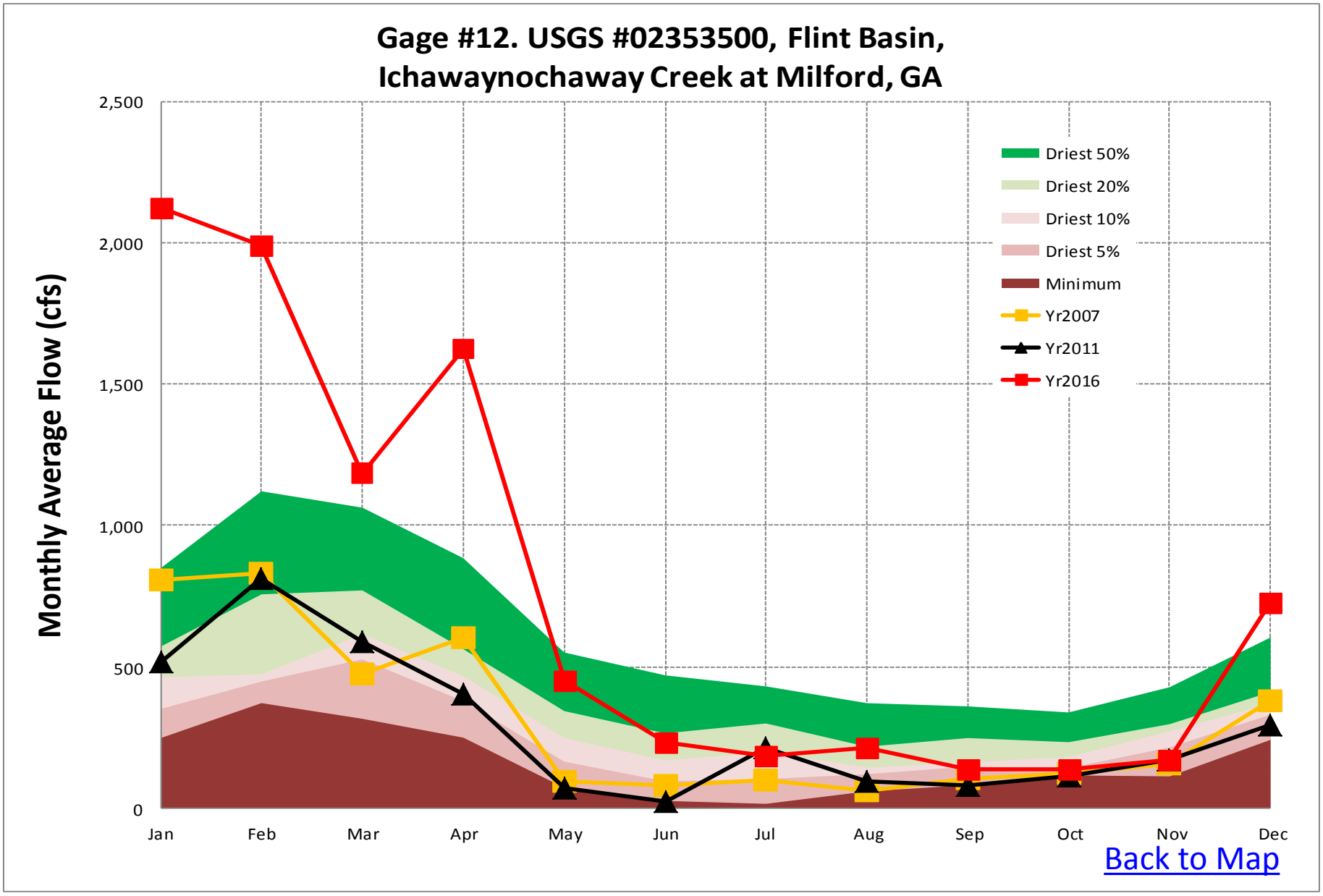
Gage #12. USGS #02353500, Flint Basin,
Ichawaynochaway Creek at Milford, GA
Monthly Average Flow (cfs)
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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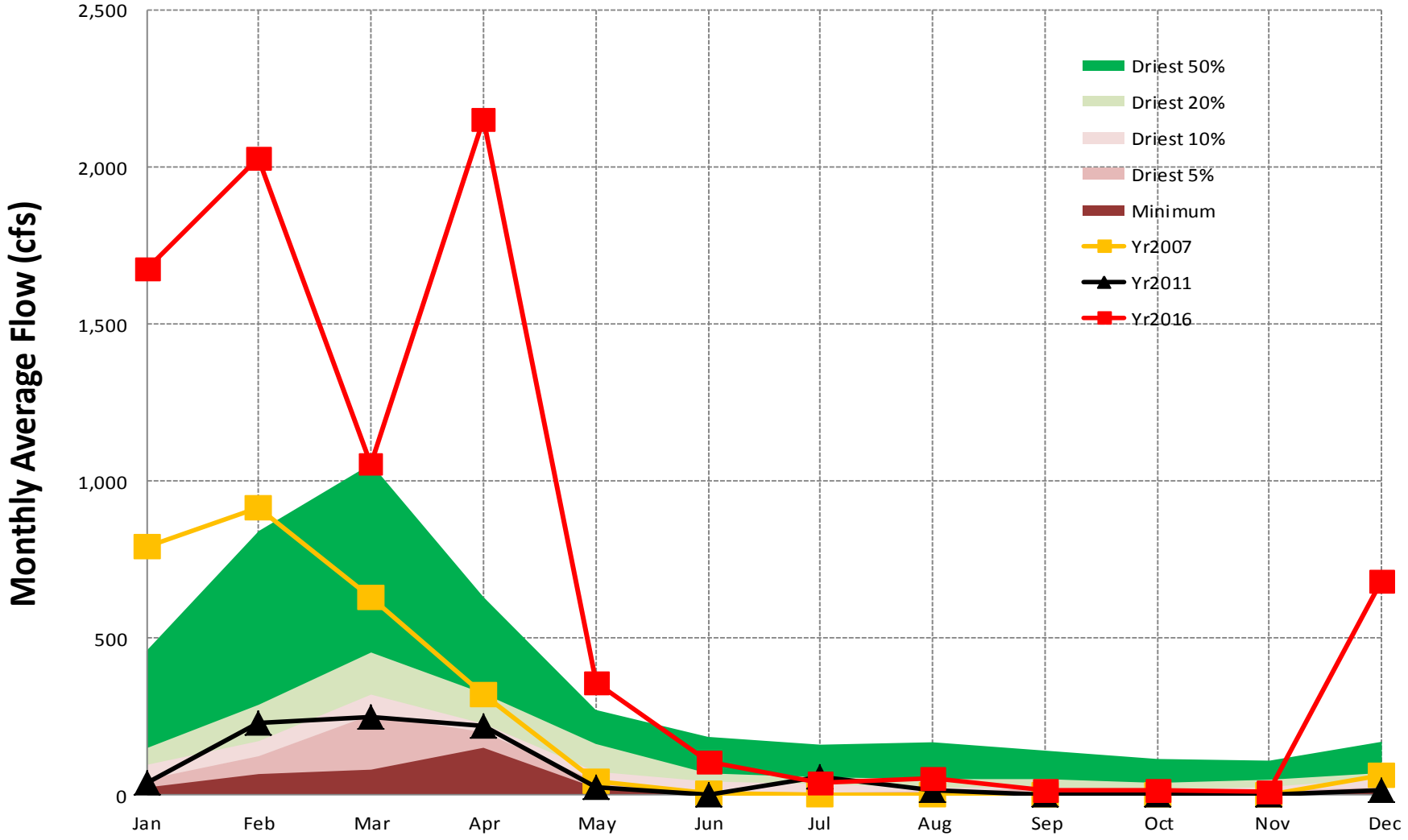
## Gage #13. USGS #02357000, Flint River, Spring Creek near Iron City, GA

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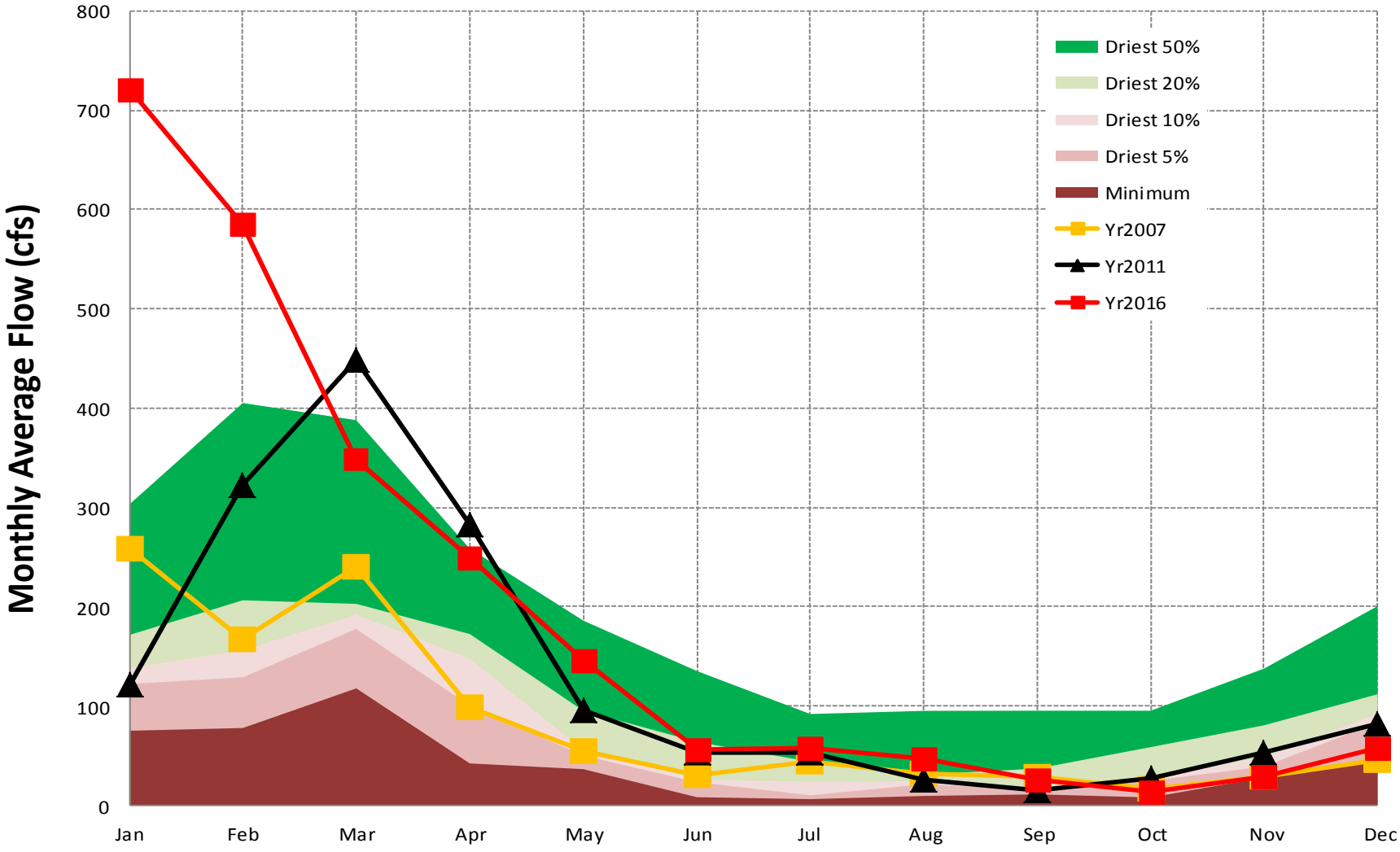
## Gage #14. USGS #02208450, Ocumulgee Basin, ALCOVY RIVER above COVINGTON, GA

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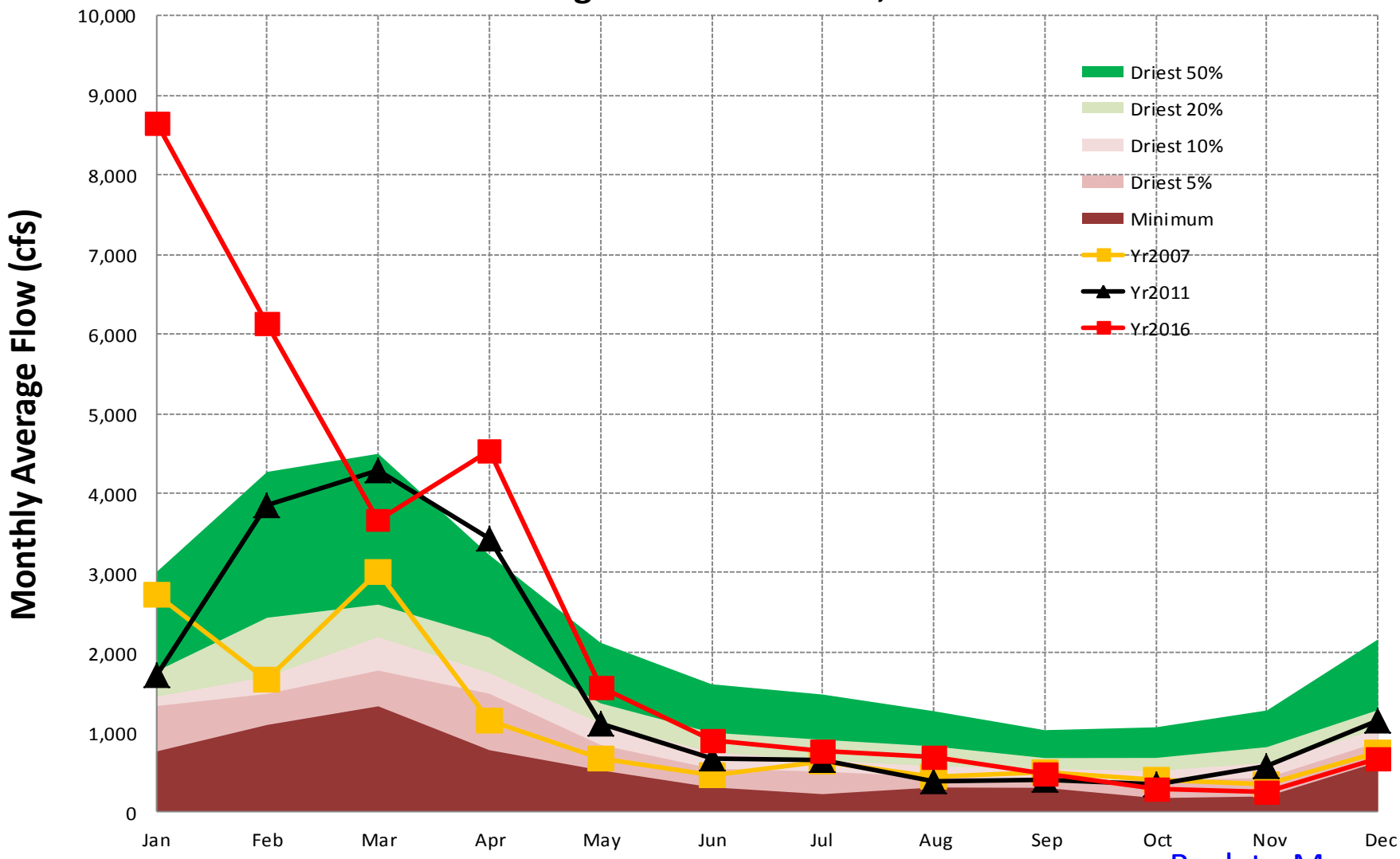
# Gage #15. USGS #02213000, Ocmulgee Basin, Ocmulgee River at Macon, GA

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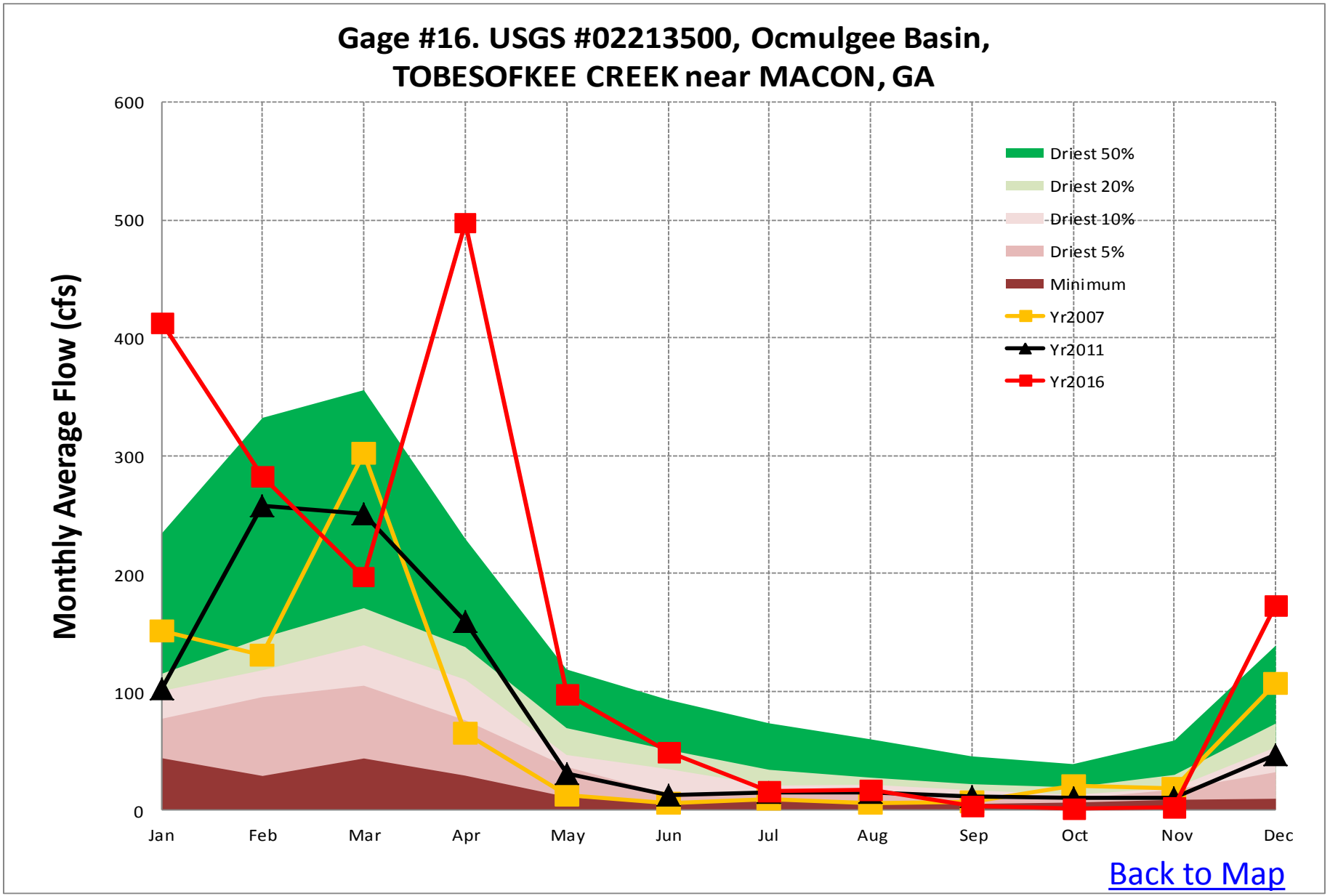
Gage #16. USGS #02213500, Ocmulgee Basin,
TOBESOFKEE CREEK near MACON, GA
Monthly Average Flow (cfs)
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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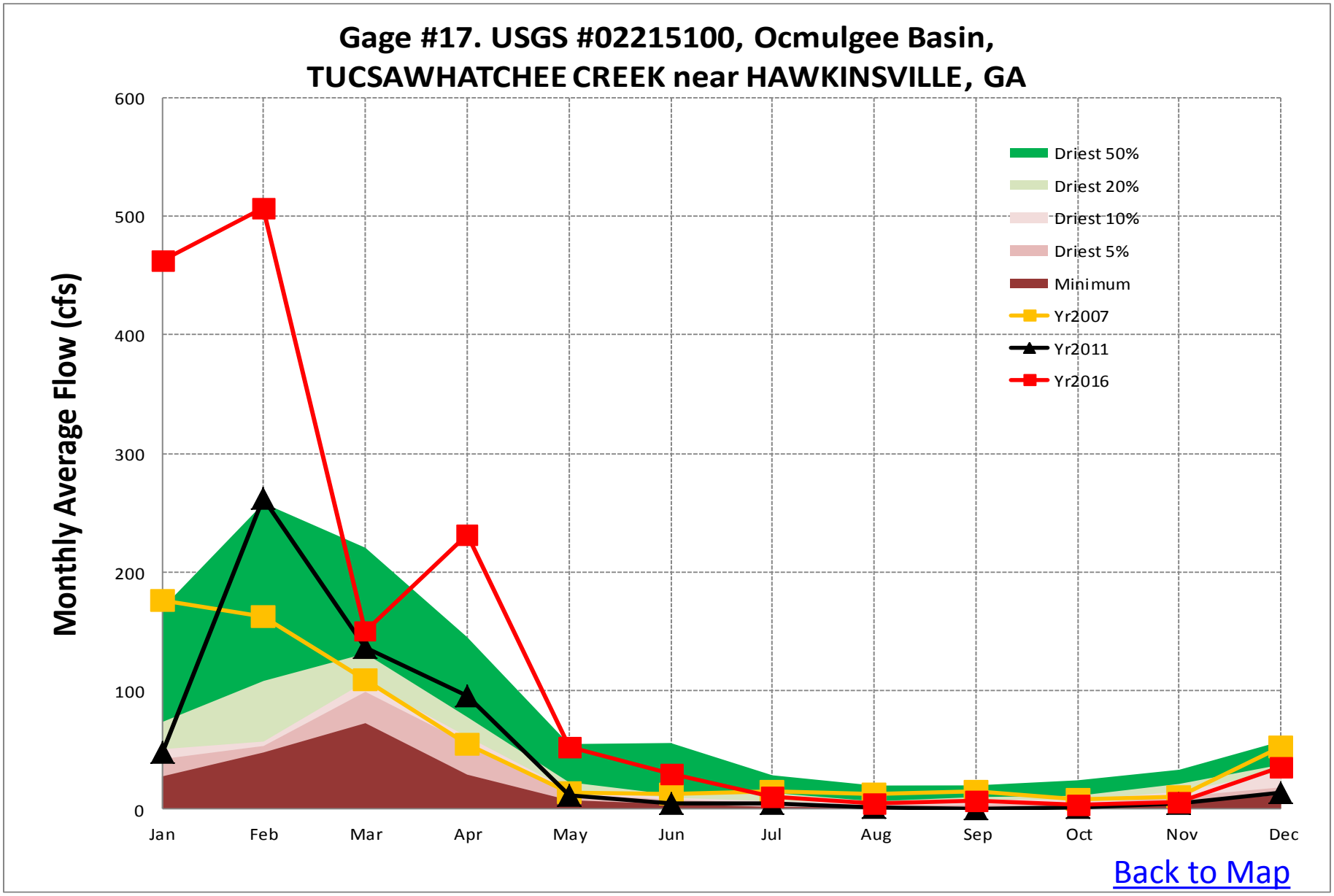
Gage #17. USGS #02215100, Ocmulgee Basin,
TUCSAWHATCHEE CREEK near HAWKINSVILLE, GA
Monthly Average Flow (cfs)
600
500
400
300
200
100
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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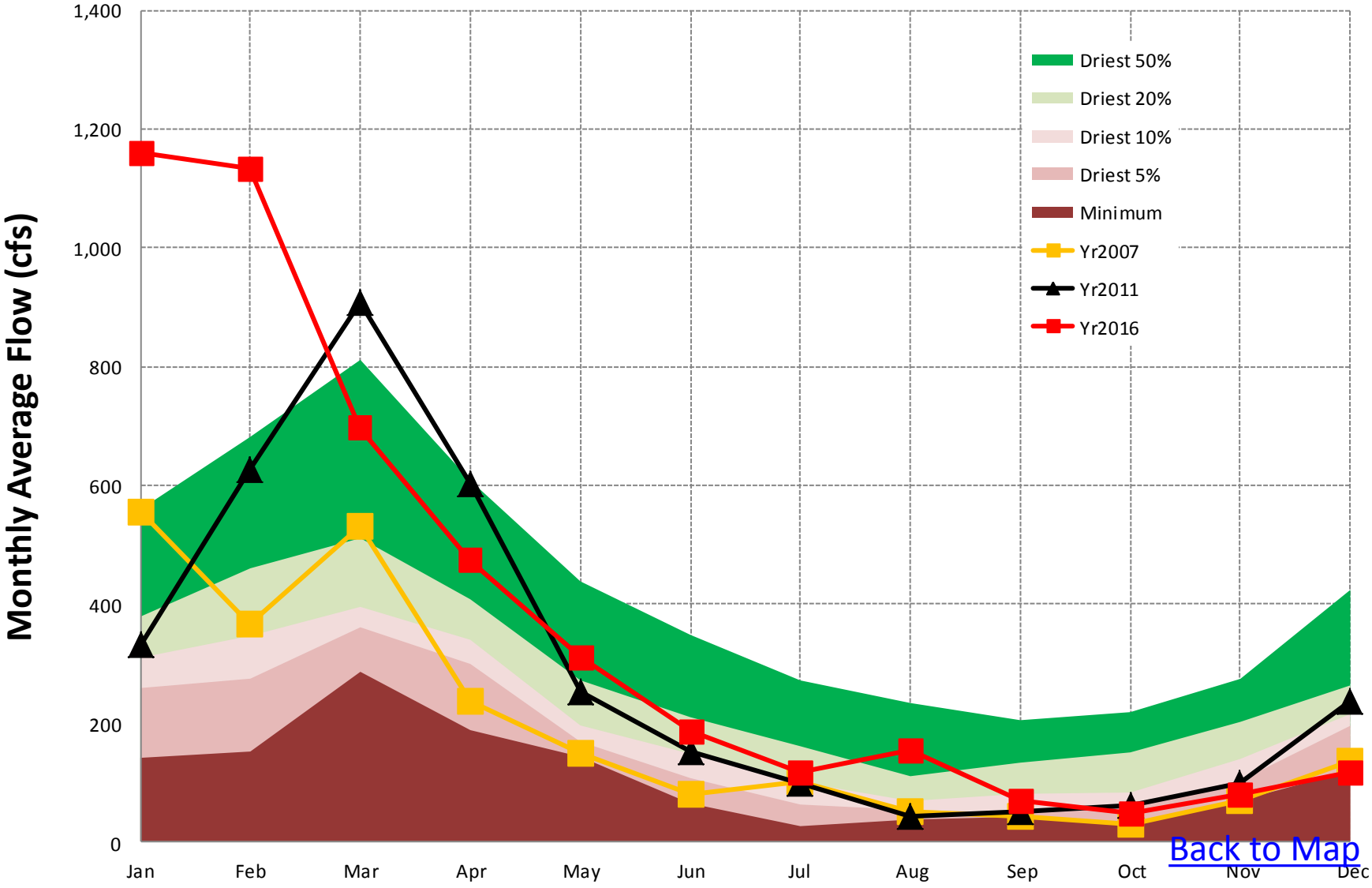
# Gage #18. USGS #02217500, Oconee Basin, MIDDLE OCONEE RIVER near ATHENS, GA

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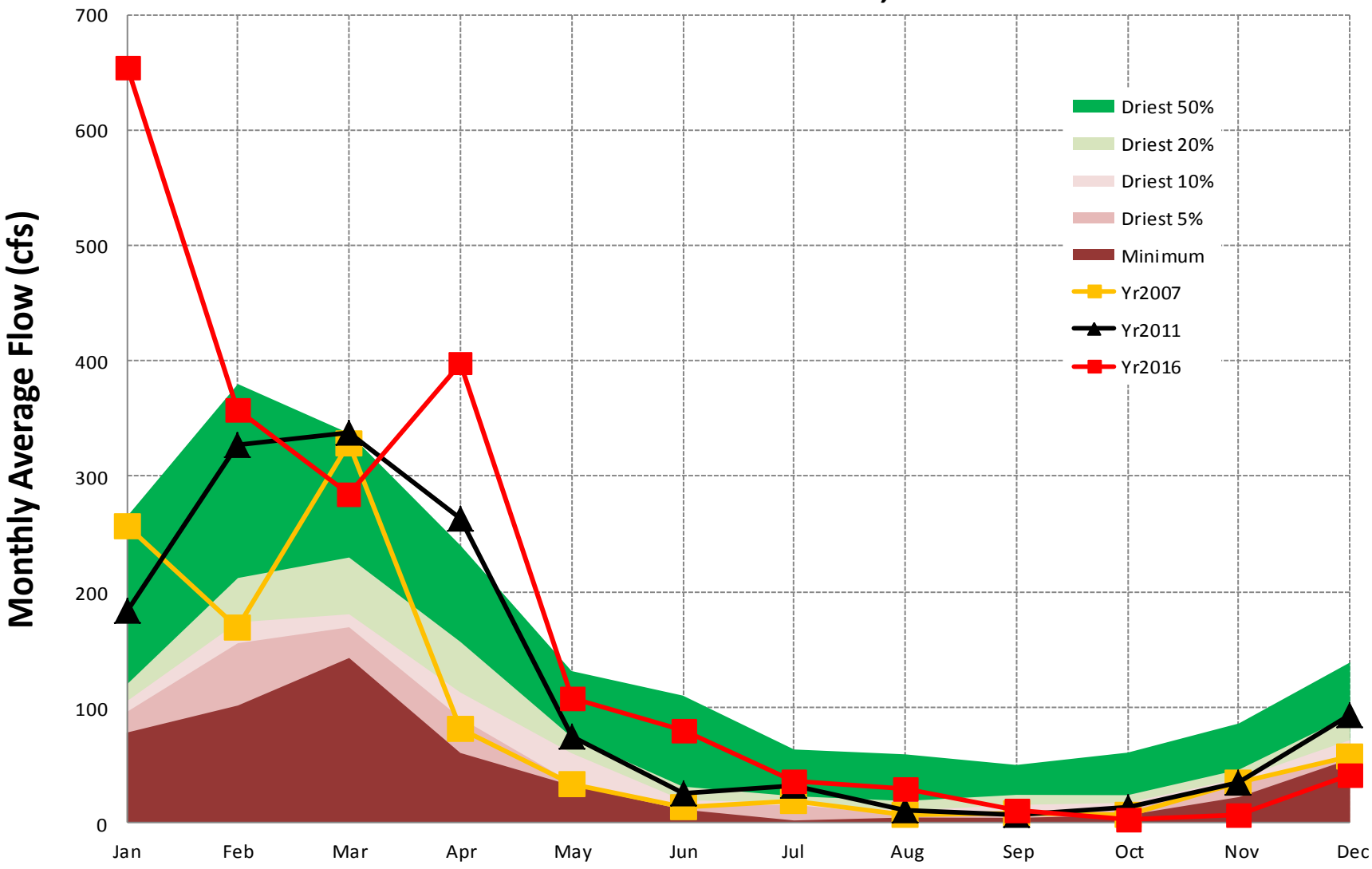
# Gage #19. USGS #02220900, Oconee Basin, LITTLE RIVER near EATONTON, GA

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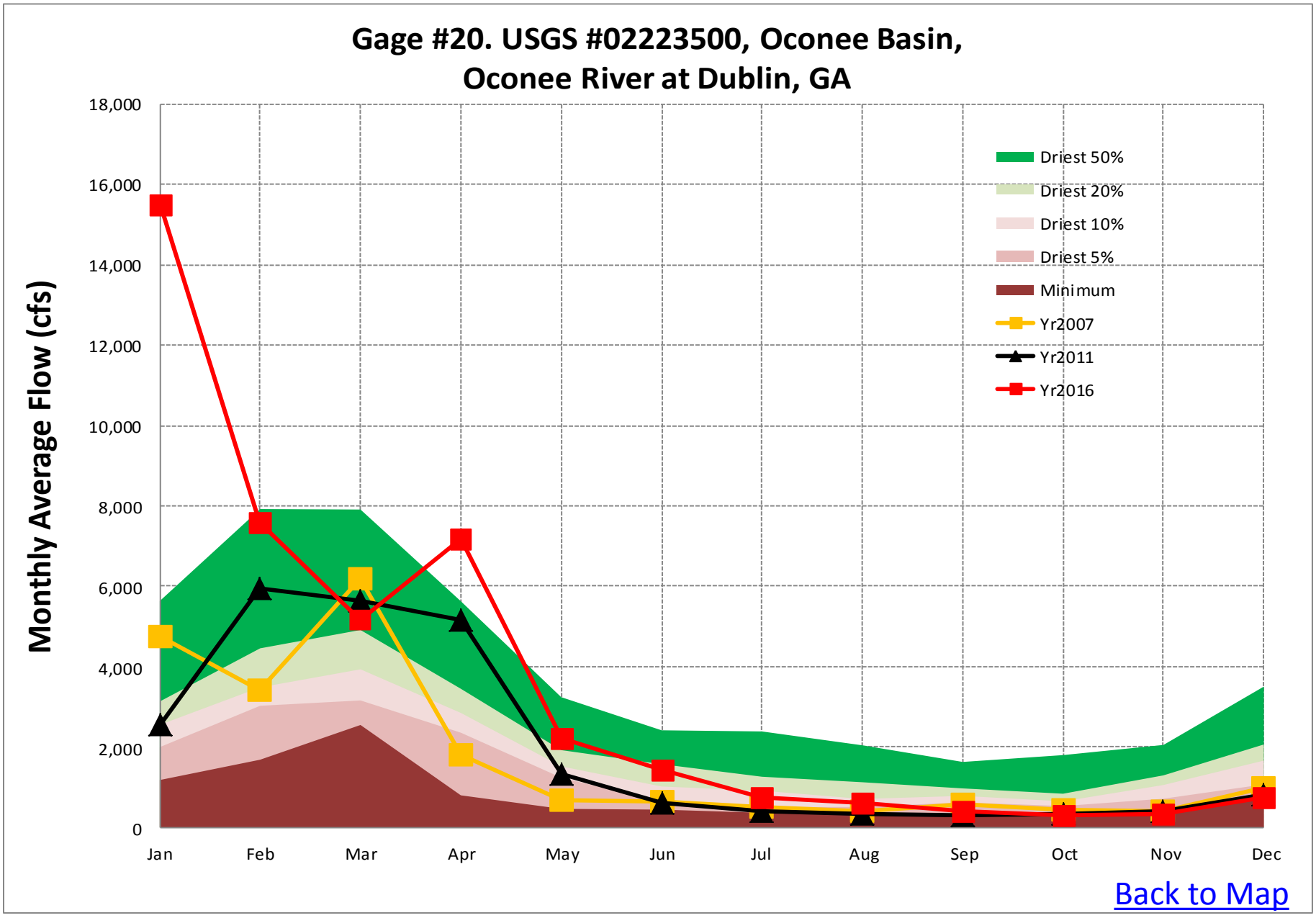
Gage #20. USGS #02223500, Oconee Basin,
Oconee River at Dublin, GA
Monthly Average Flow (cfs)
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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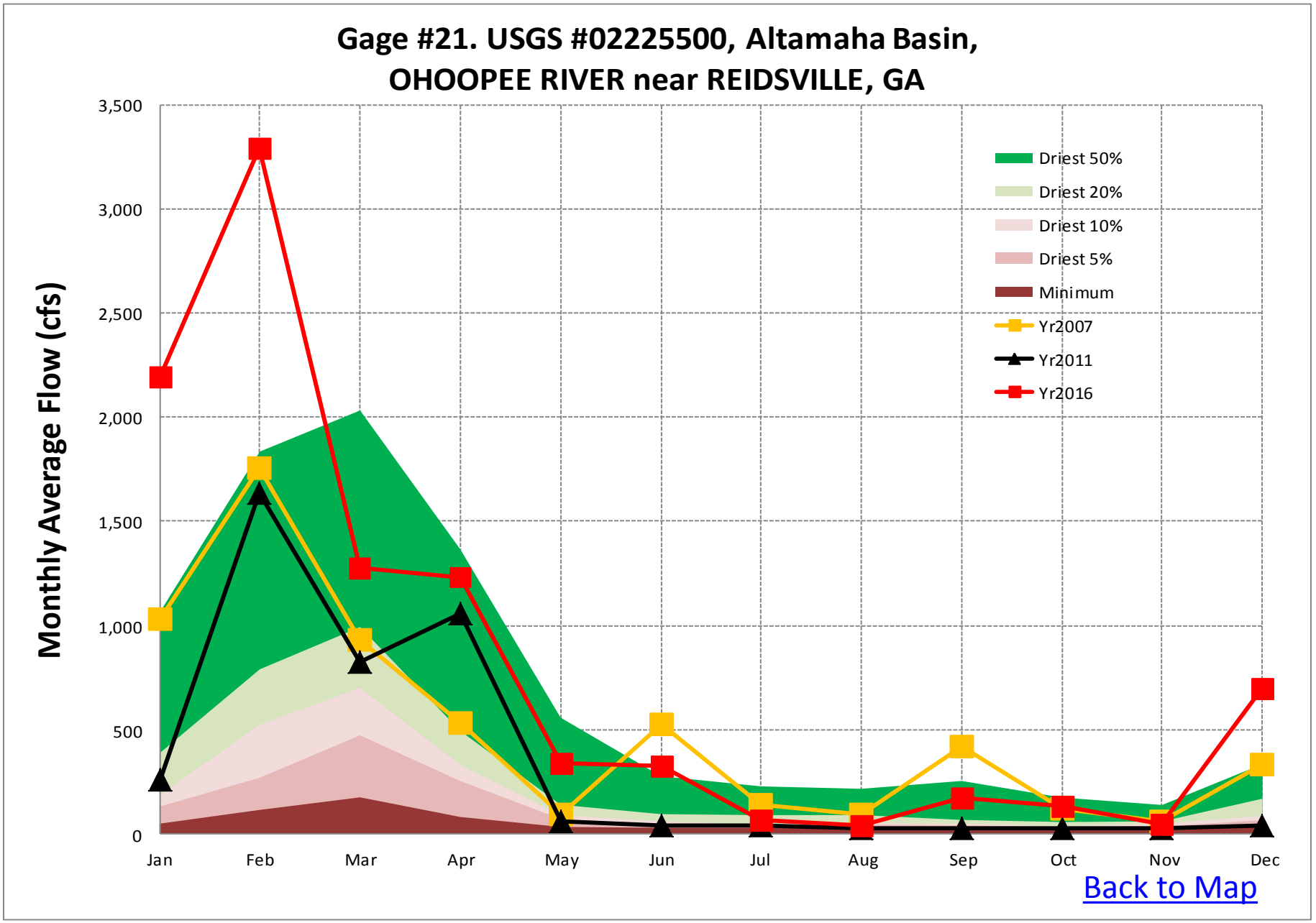
Gage #21. USGS #02225500, Altamaha Basin,
OHOOPEE RIVER near REIDSVILLE, GA
Monthly Average Flow (cfs)
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016
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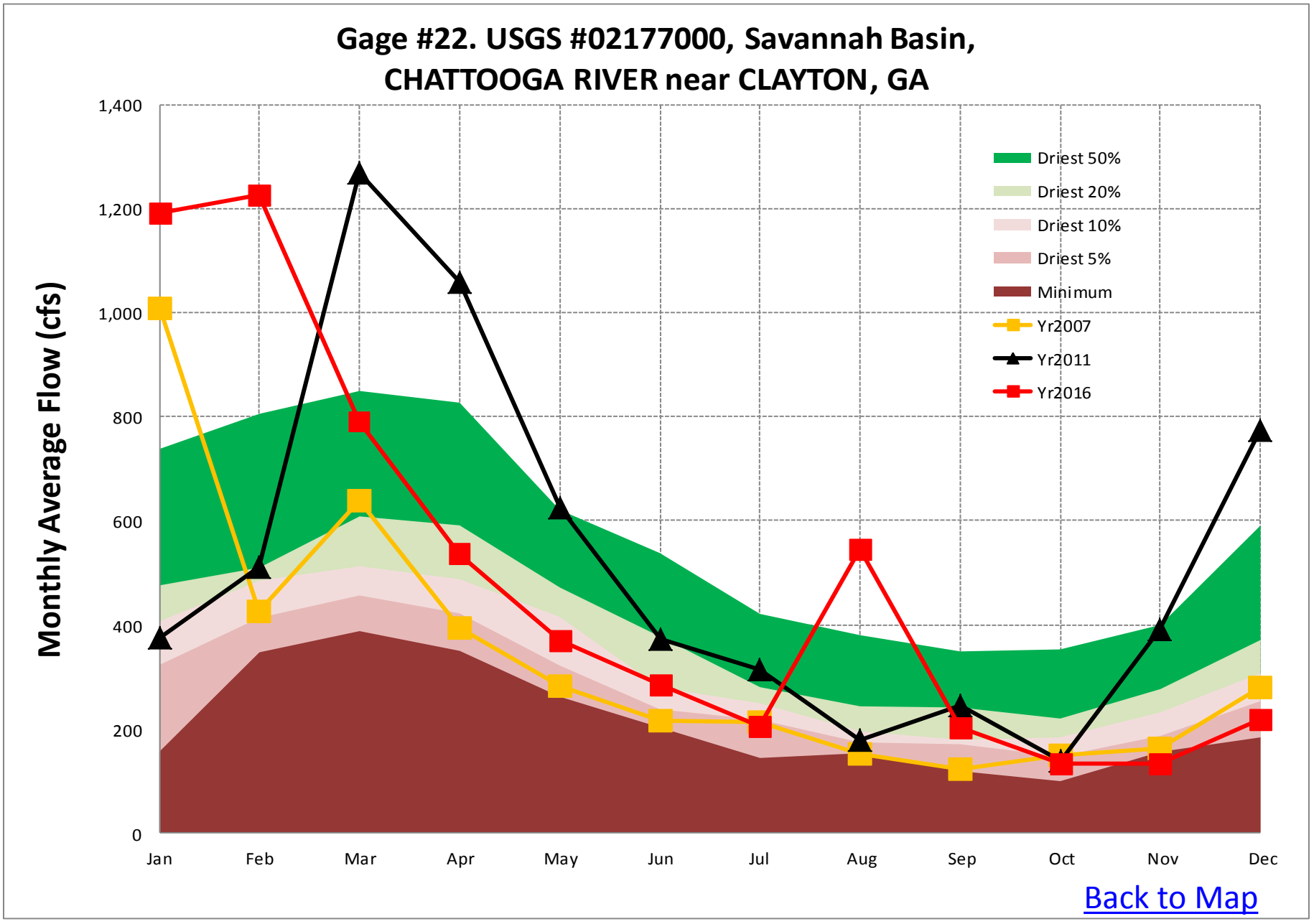
Gage #22. USGS #02177000, Savannah Basin,
CHATTOOGA RIVER near CLAYTON, GA
Monthly Average Flow (cfs)
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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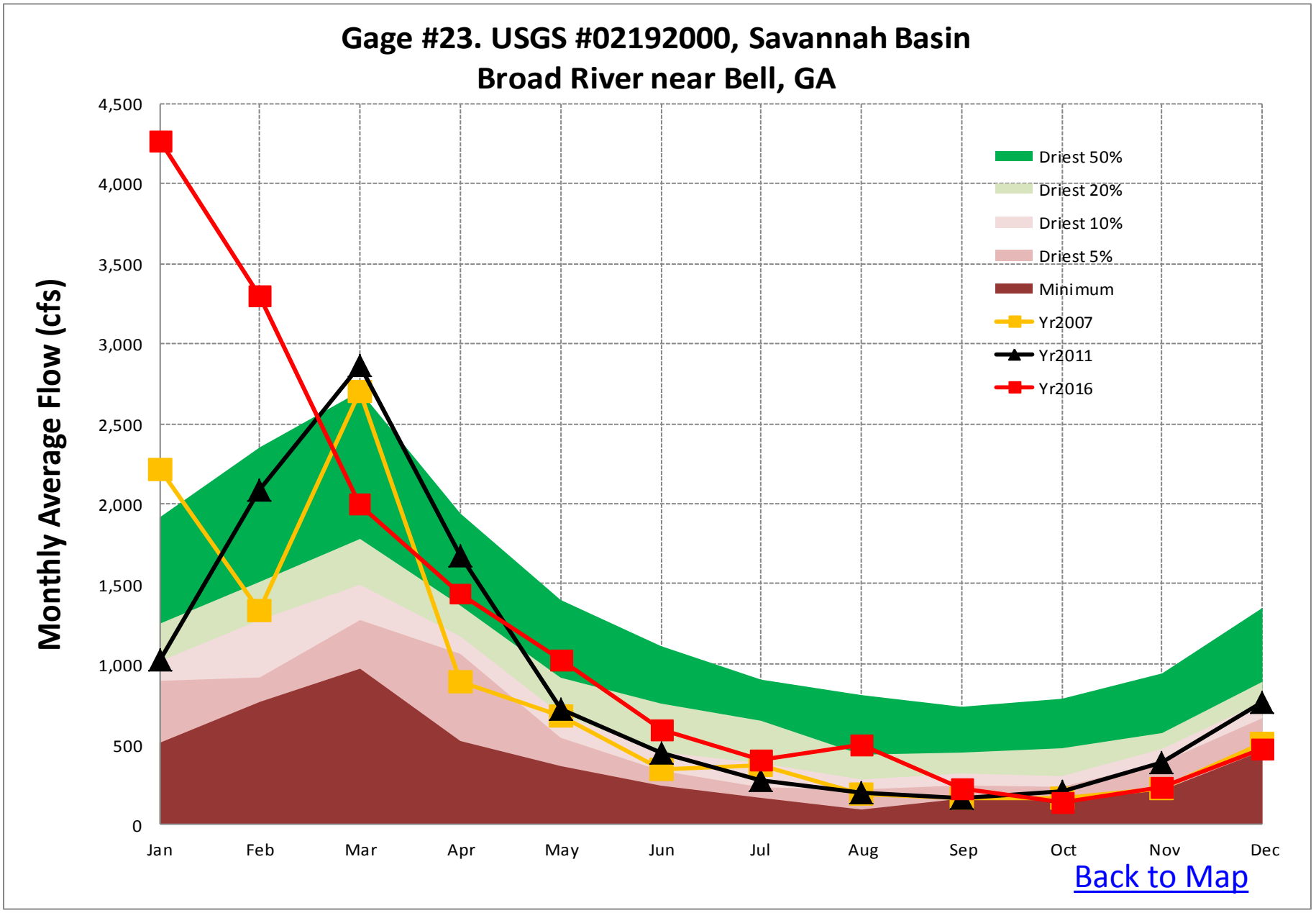
Gage #23. USGS #02192000, Savannah Basin
Broad River near Bell, GA
Monthly Average Flow (cfs)
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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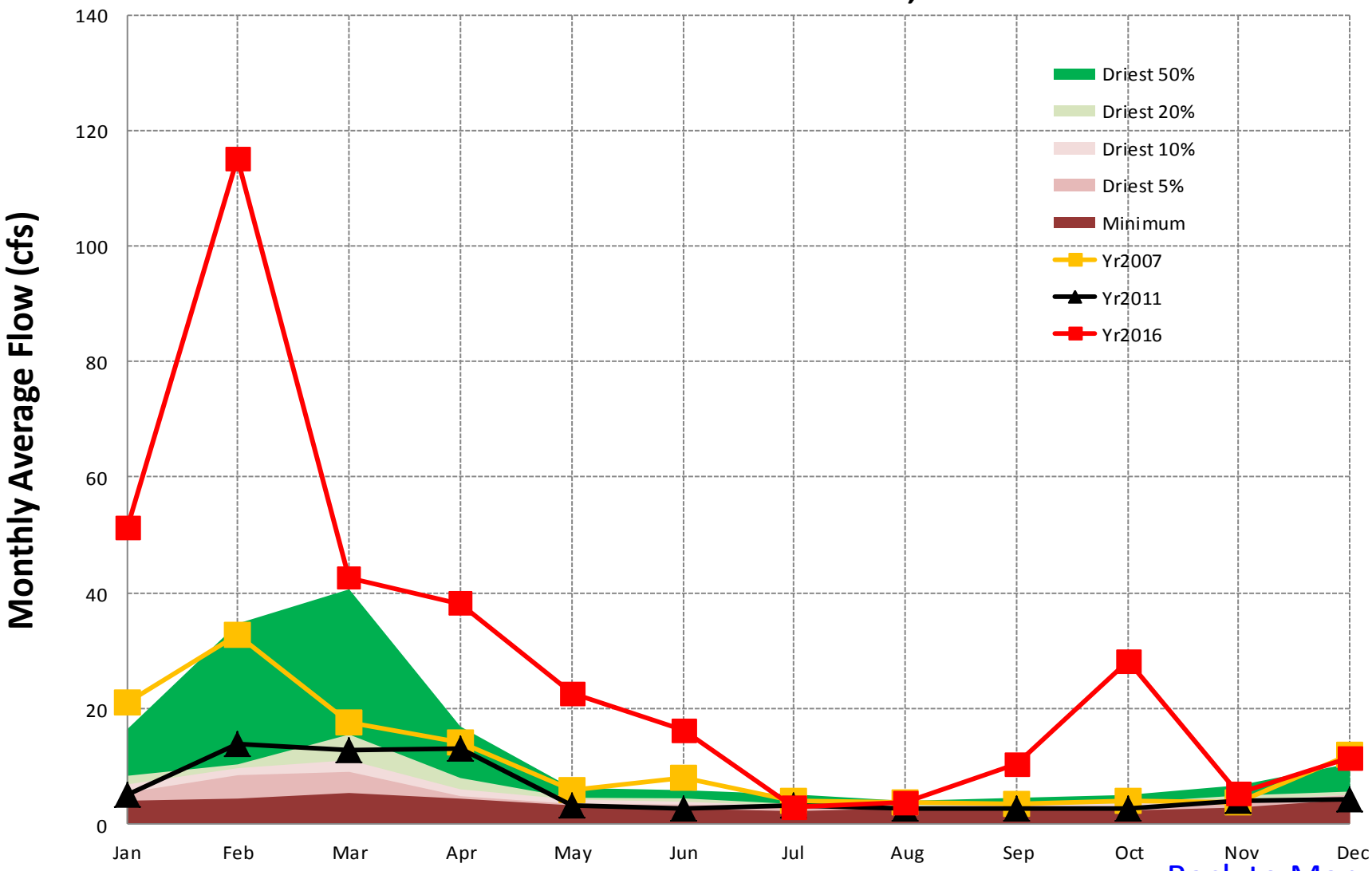
# Gage #24. USGS #02198100, Savannah Basin, BEAVERDAM CREEK near SARDIS, GA

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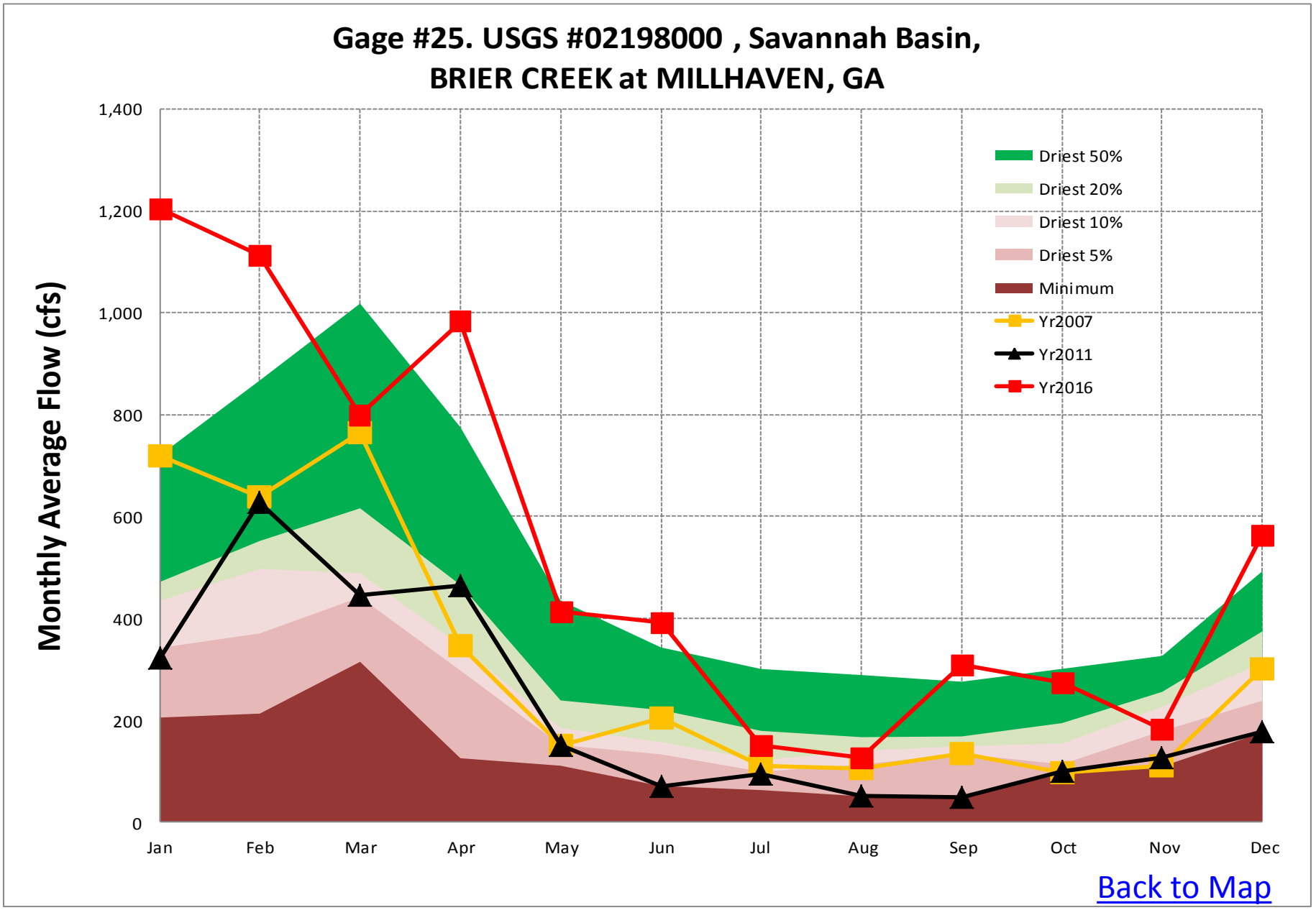
Gage #25. USGS #02198000 , Savannah Basin,
BRIER CREEK at MILLHAVEN, GA
Monthly Average Flow (cfs)
1,400
1,200
1,000
800
600
400
200
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2016

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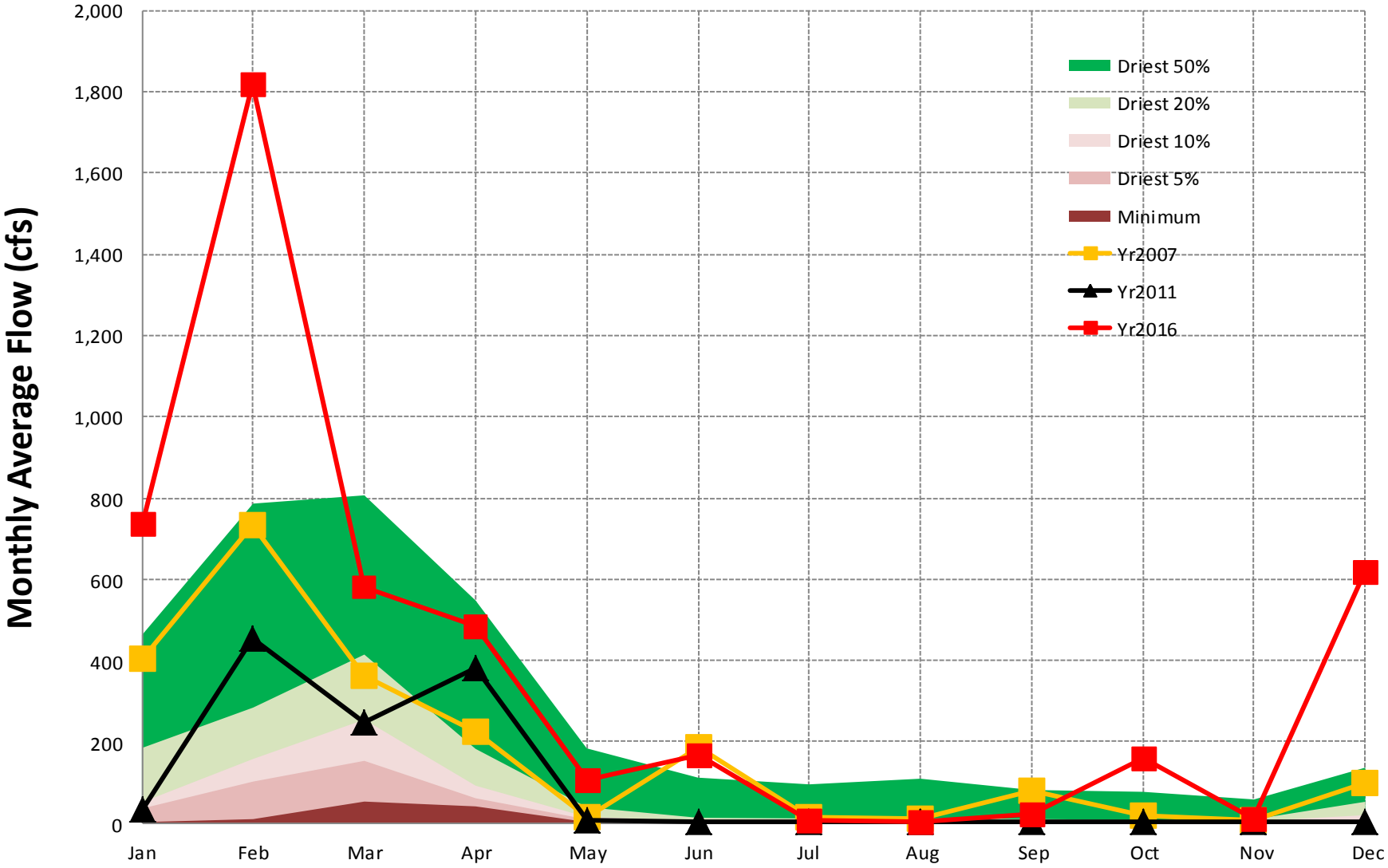
# Gage #26. USGS #02203000, Ogeechee Basin, CANOOCHEE RIVER near CLAXTON, GA

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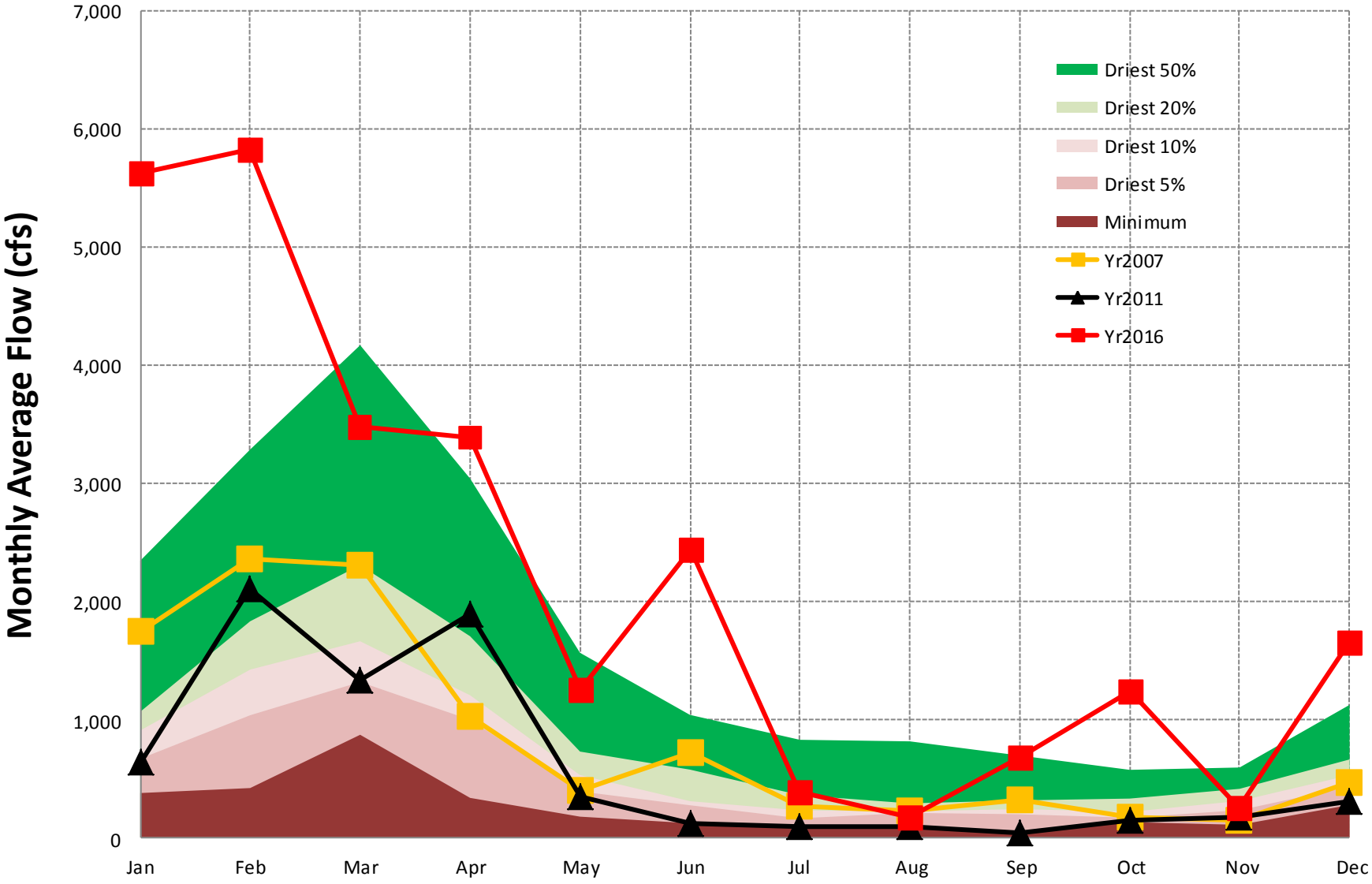
# Gage #27. USGS #02202500, Ogeechee Basin, Ogeechee River near Eden, GA

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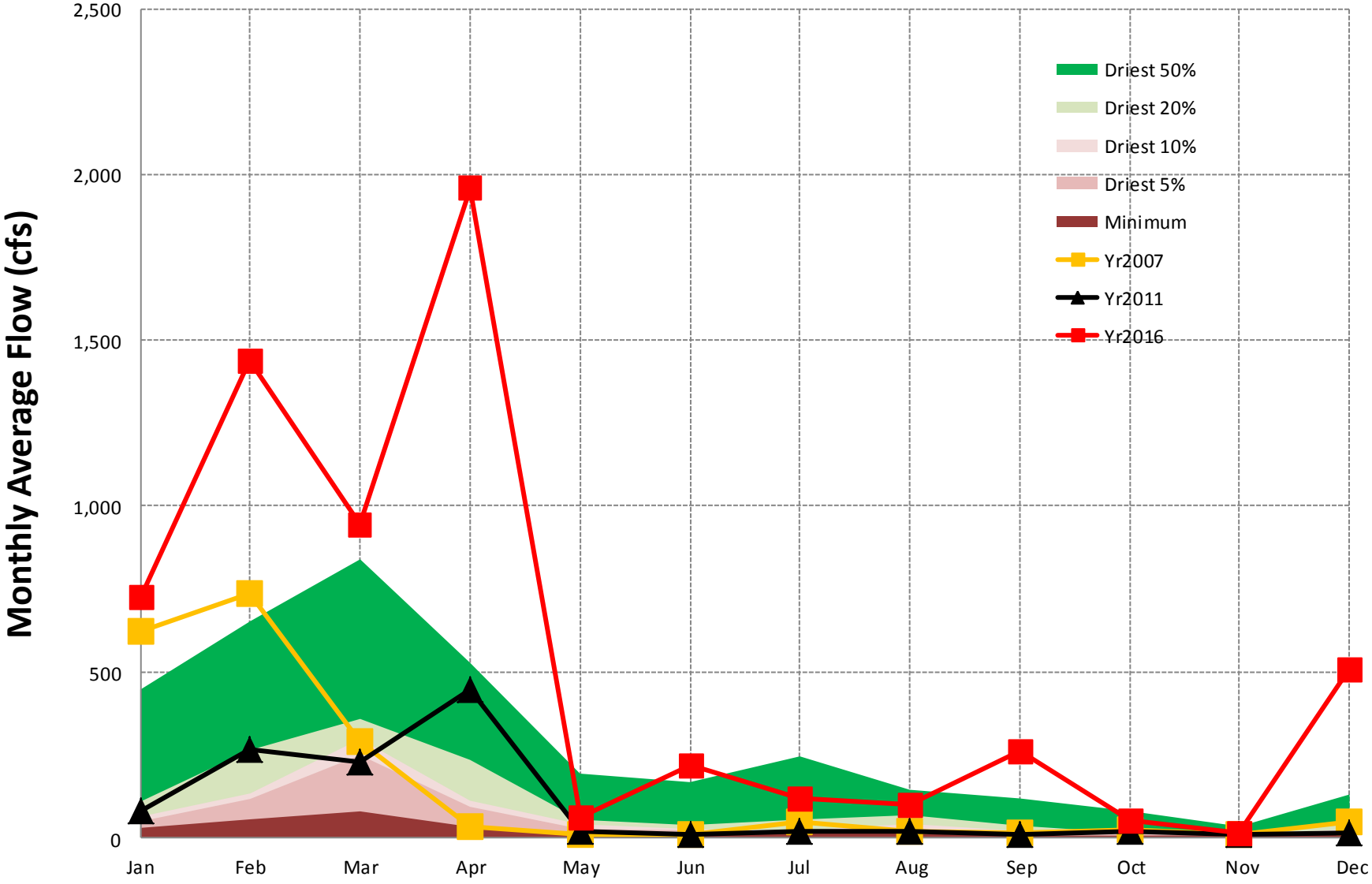
# Gage #28. USGS #02327500, Ochlockonee Basin, OCHLOCKONEE RIVER near THOMASVILLE, GA

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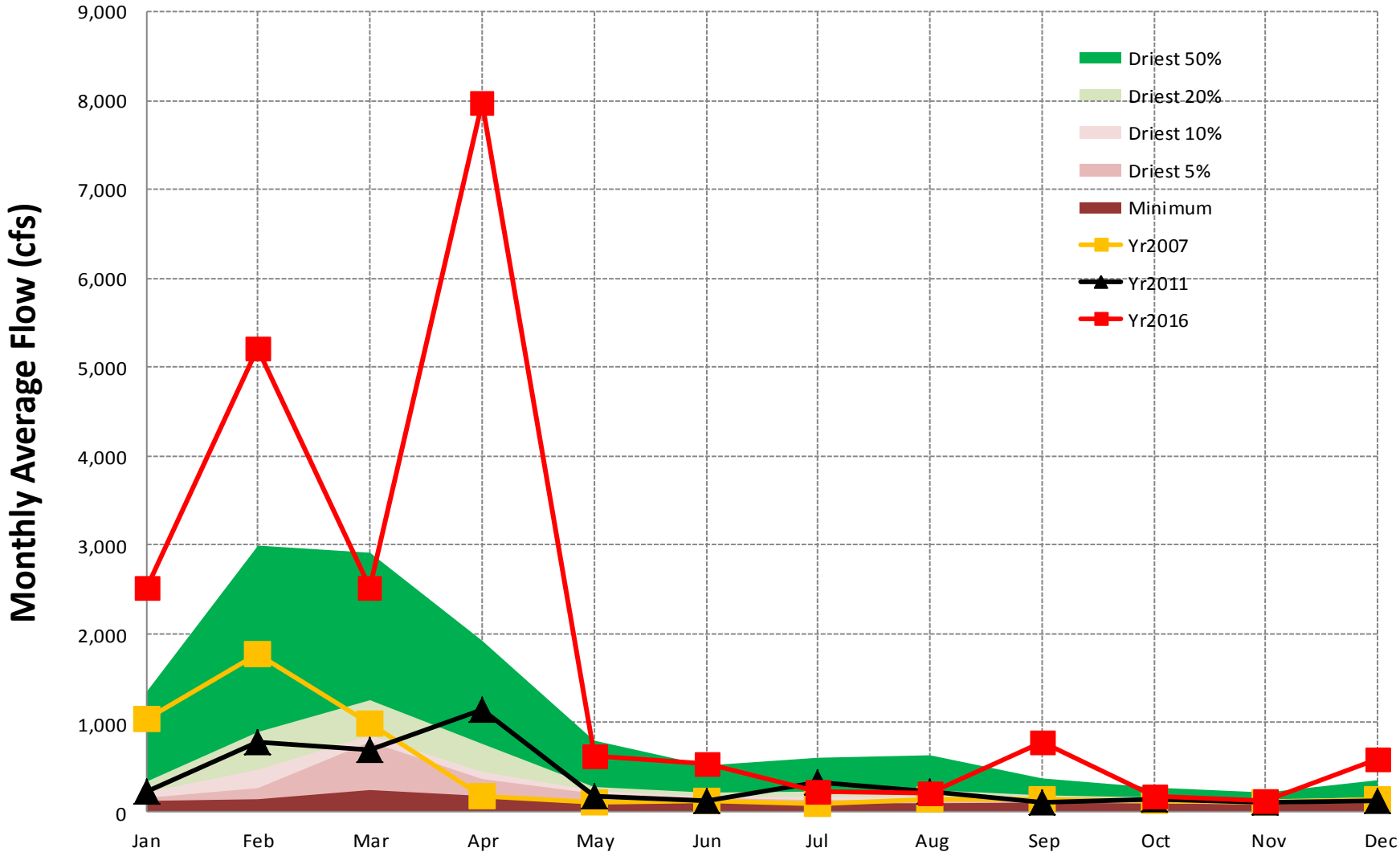
# Gage #29. USGS #02319000, Suwanee Basin, WITHLACOOCHEE RIVER near PINETTA, FL

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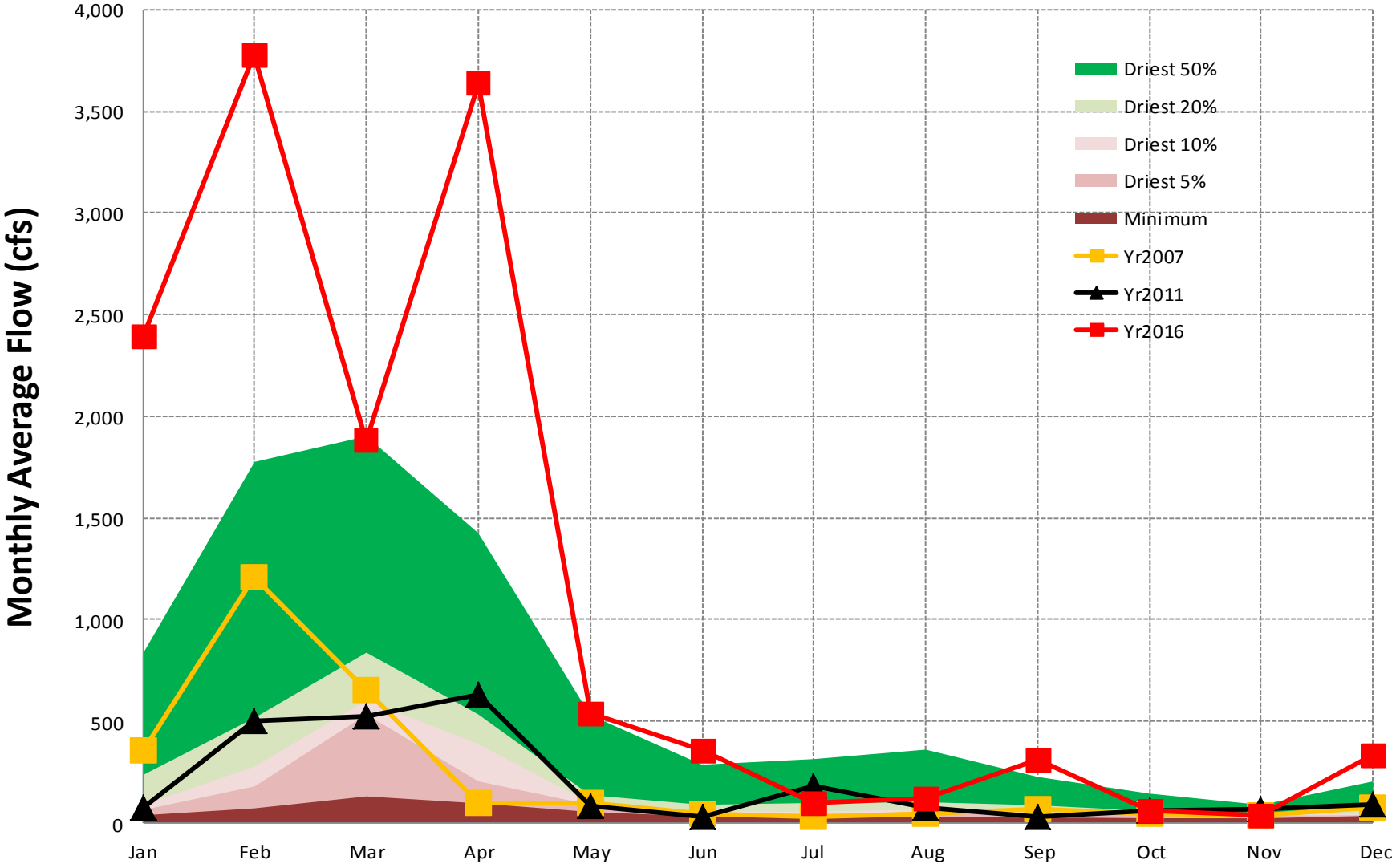
# Gage #30. USGS #02317500, Suwanee Basin, Alapaha River at Statenville, GA

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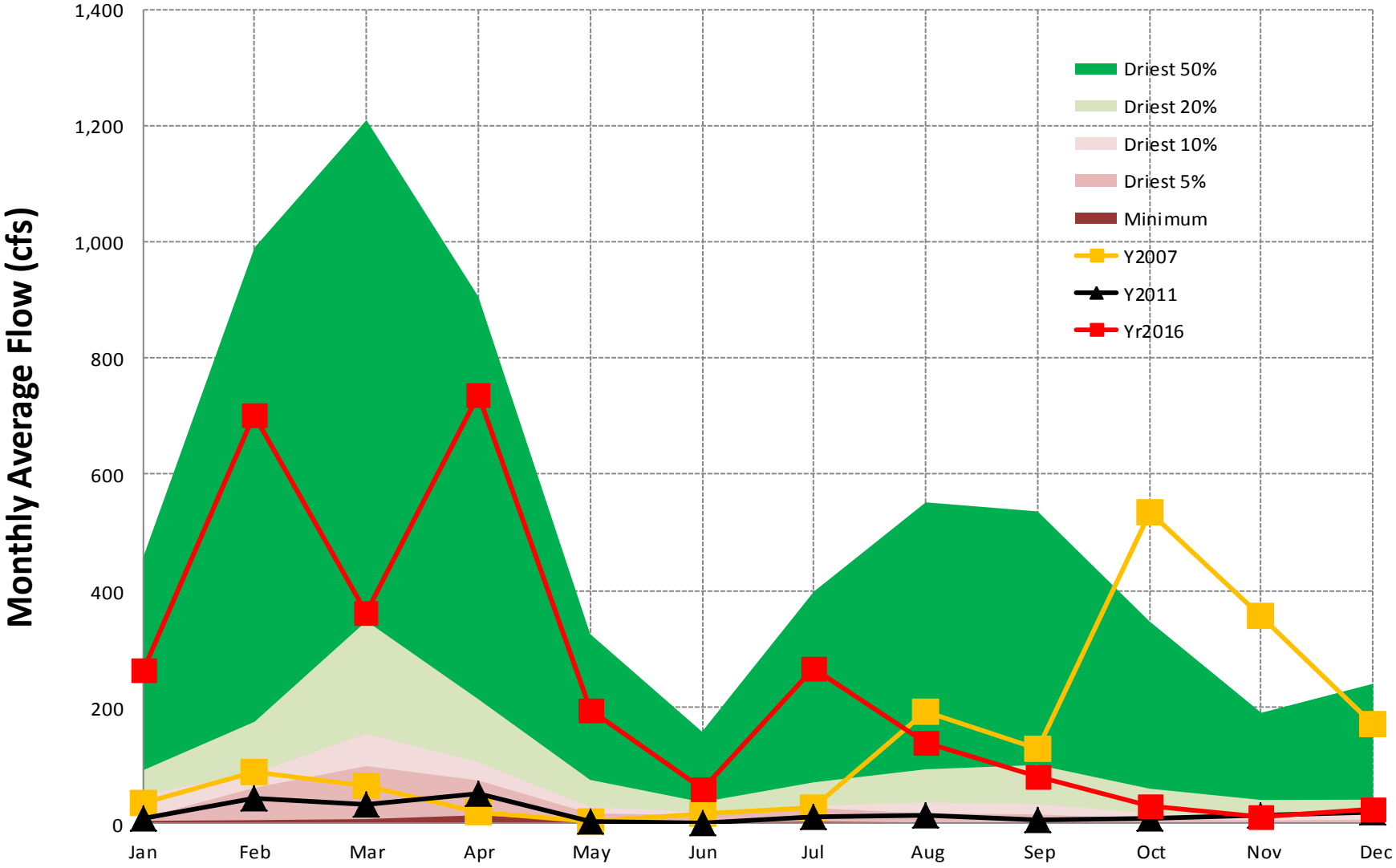
# Gage #31. USGS #02314500, Suwanee Basin, SUWANNEE RIVER AT US 441, AT FARGO, GA

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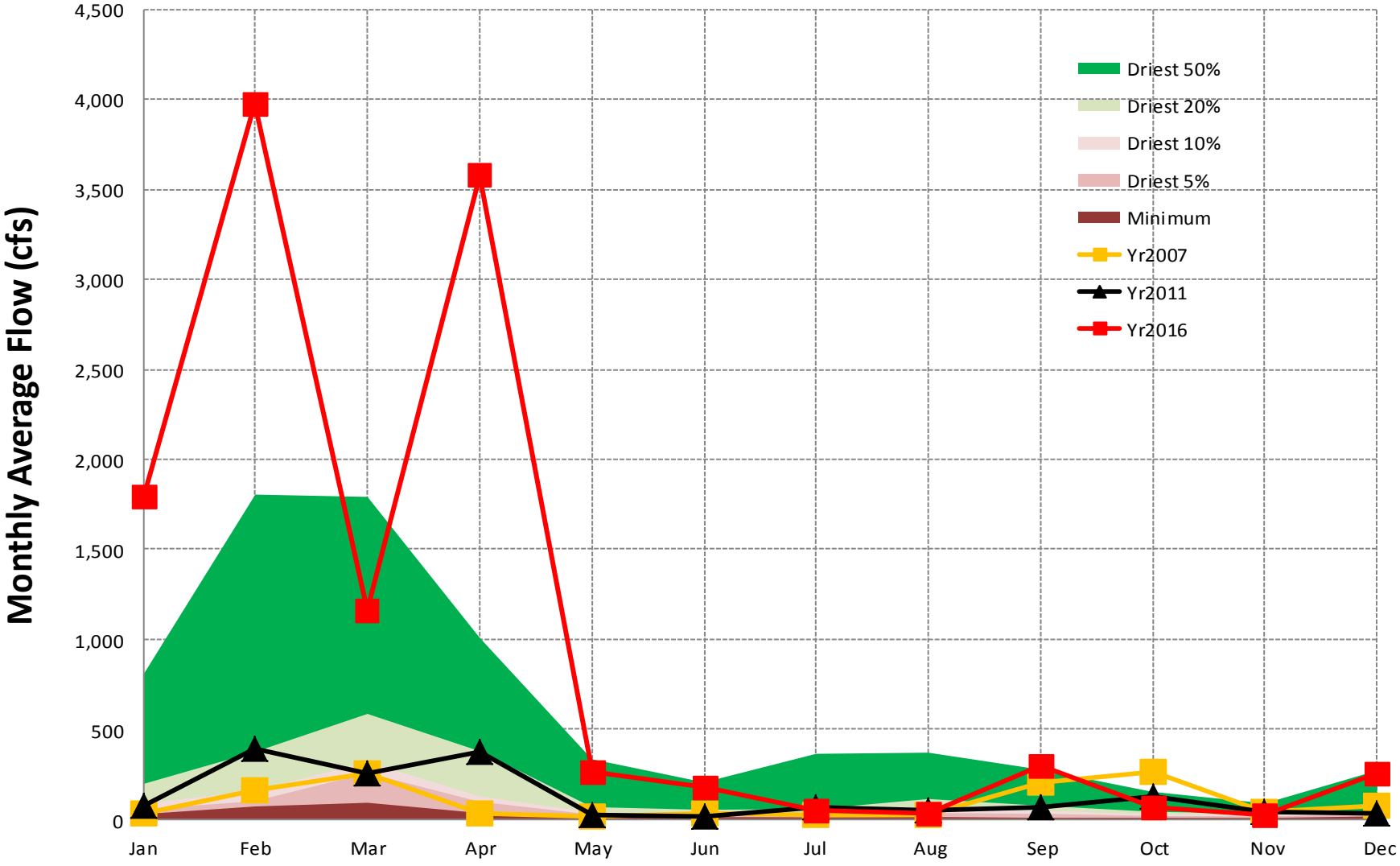
# Gage #32. USGS #02226500, Satilla Basin, Satilla River near Waycross, GA

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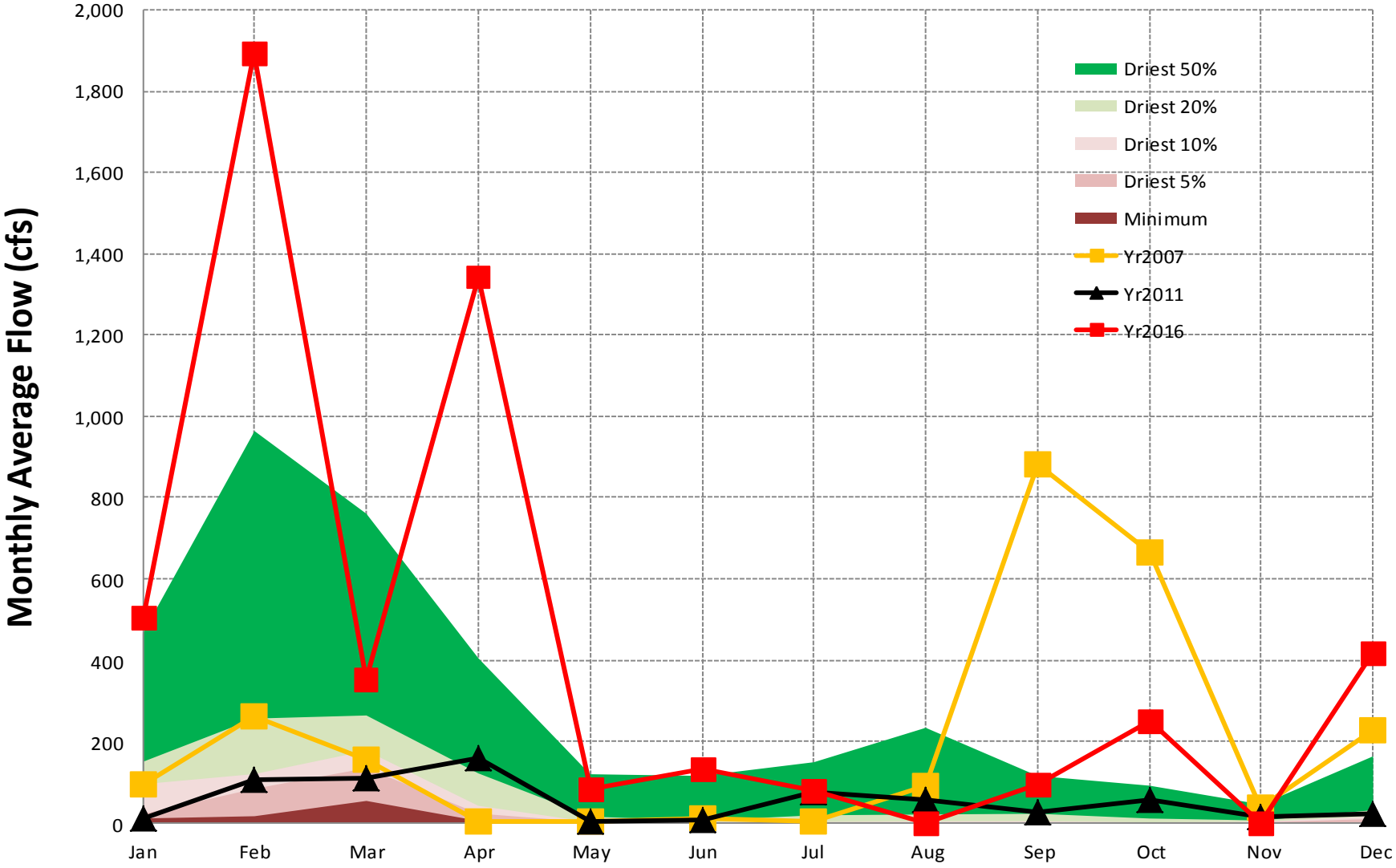
## Gage #33. USGS #02227500, Satilla Basin, LITTLE SATILLA RIVER near OFFERMAN, GA

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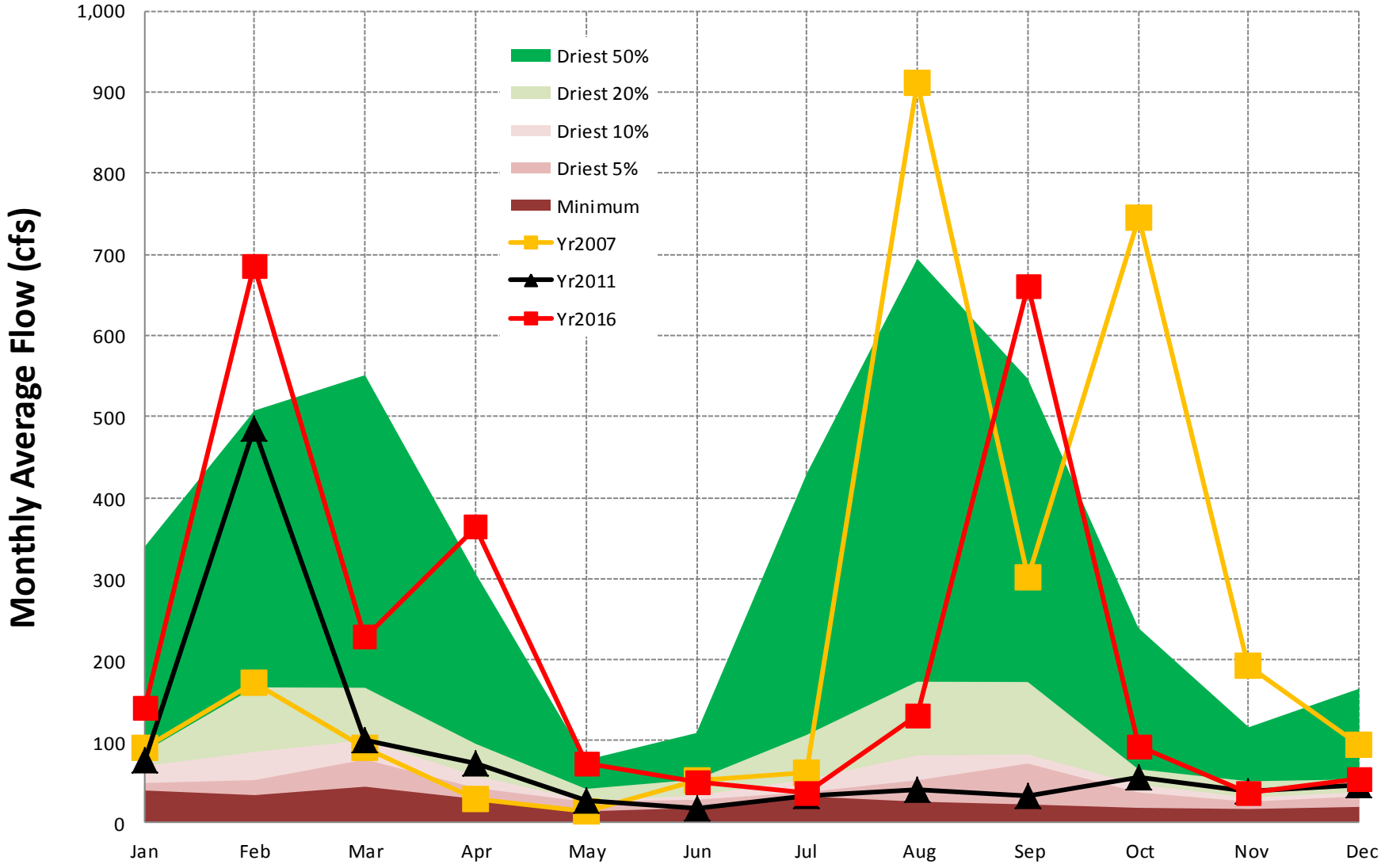
# Gage #34. USGS #02231000, St Mary Basin, ST. MARYS RIVER near MACCLENNY, FL

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# Groundwater Levels

Data Source:  USGS

# Rationale for Choosing USGS Monitoring Wells

EPD monitors 14 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 by EPD to Assess Drought Conditions

### Savannah Basin
1. 30AA04

### Flint Basin
2. 11AA01
3. 13L180
4. 12M017
5. 08K001
6. 11K003
7. 12K014
8. 13J004
9. 08G001
10. 10G313
11. 09F520

### Oconee Basin
12. 21T001

### Altamaha Basin
13. 26R001

### Suwanee Basin
14. 19E009

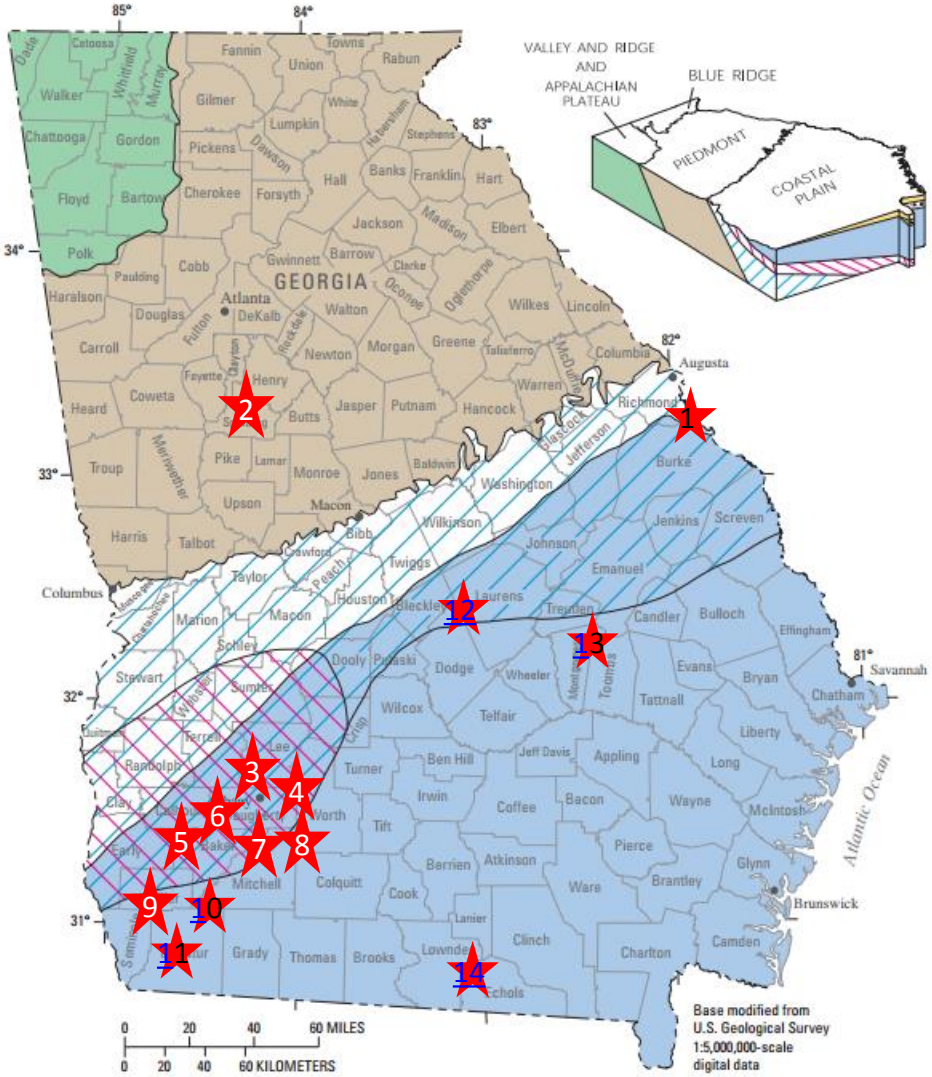



**Figure 2.** Area of use of principal aquifers and physiographic provinces in Georgia (modified from U.S. Geological Survey, 2006).

# Groundwater Level Graphs

- For each of the 15 groundwater wells, EPD has prepared a graph that shows monthly average groundwater levels from January, 2016 through December, 2016;
- 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.

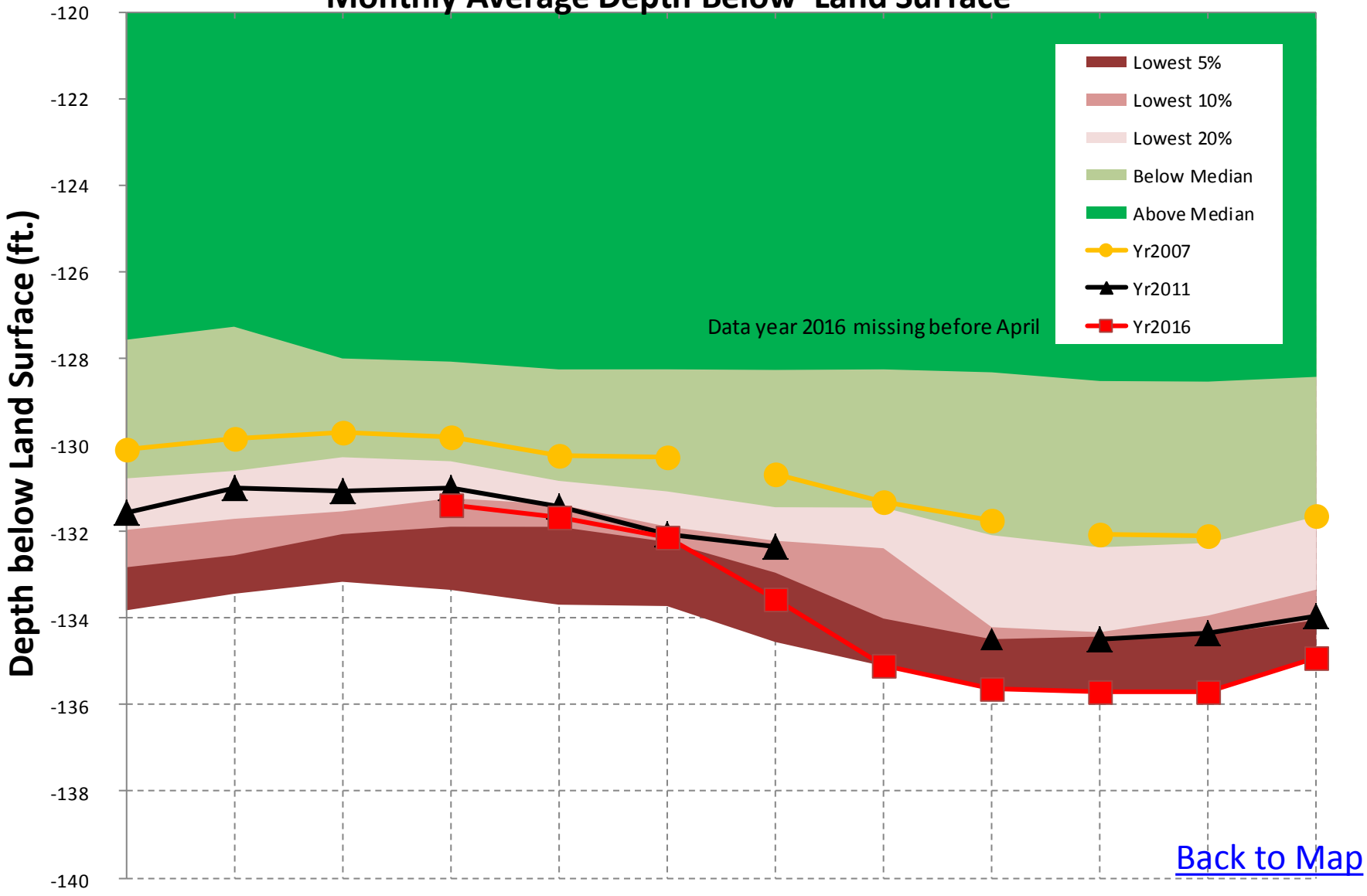
# How to Read the Groundwater Level Graphs

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

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

- The average monthly groundwater level for December 2016 was 49ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in July have historically been lower than December 2016 about 50% of the time; about 50% of the time in December they have been higher.
- The average monthly groundwater level in December 2011 was 51ft below land surface. The statistical composite of all historical data for this well shows that average monthly groundwater elevation levels for December equal to the historically lowest recorded average elevation for December.
- The average monthly groundwater level in December 2007 was 51ft below land surface. The statistical composite of all historical data for this well shows that average monthly groundwater elevation levels for December higher than to the historically lowest recorded average elevation for December.
- The lowest recorded average monthly groundwater level for December was 51ft below land surface.

# Well #1, 30AA04, Gordon & Dublin Aquifers in Savannah Basin, Monthly Average Depth Below Land Surface

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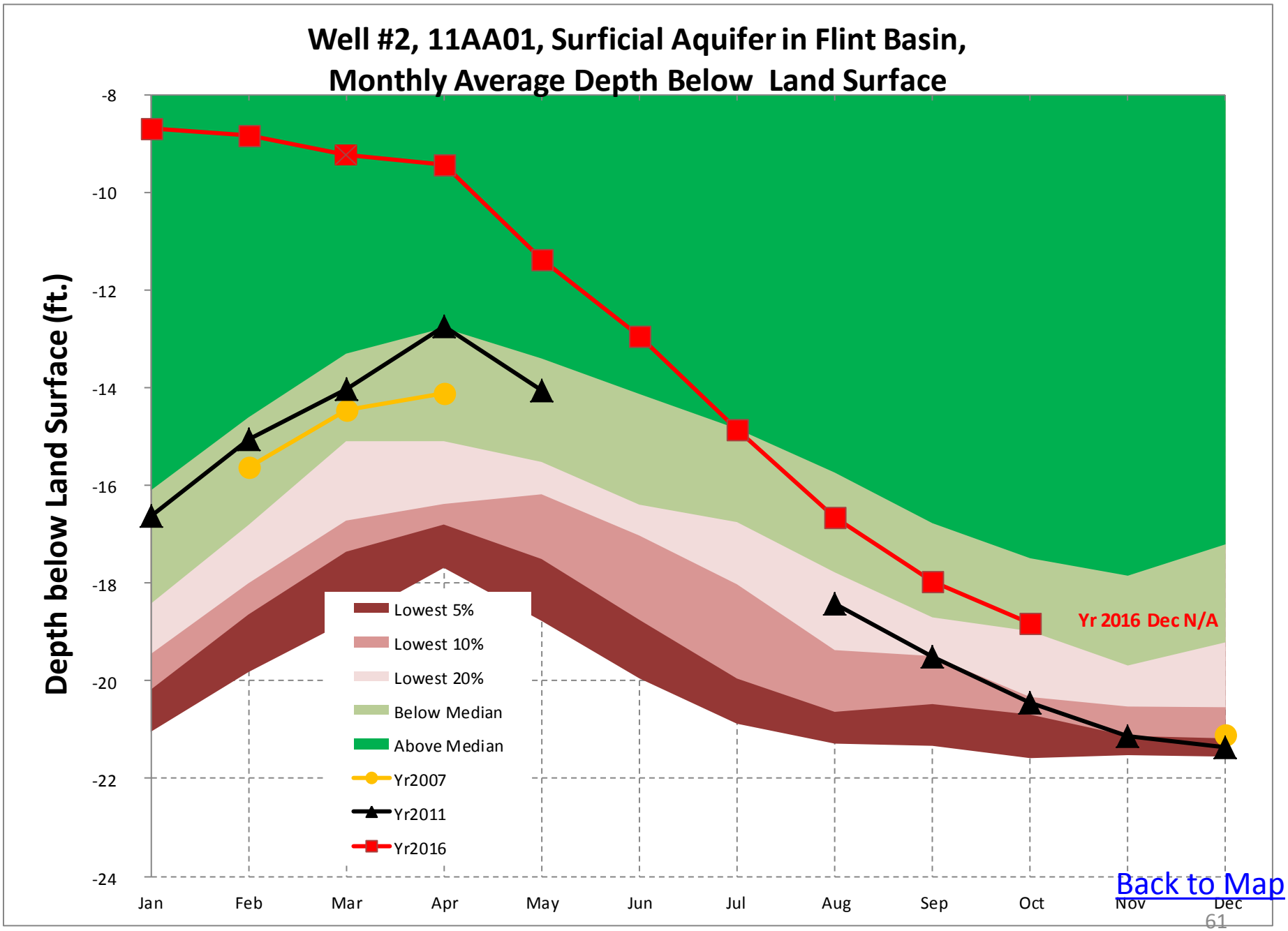
Well #2, 11AA01, Surficial Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-8
-10
-12
-14
-16
-18
-20
-22
-24
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2016
Yr 2016 Dec N/A

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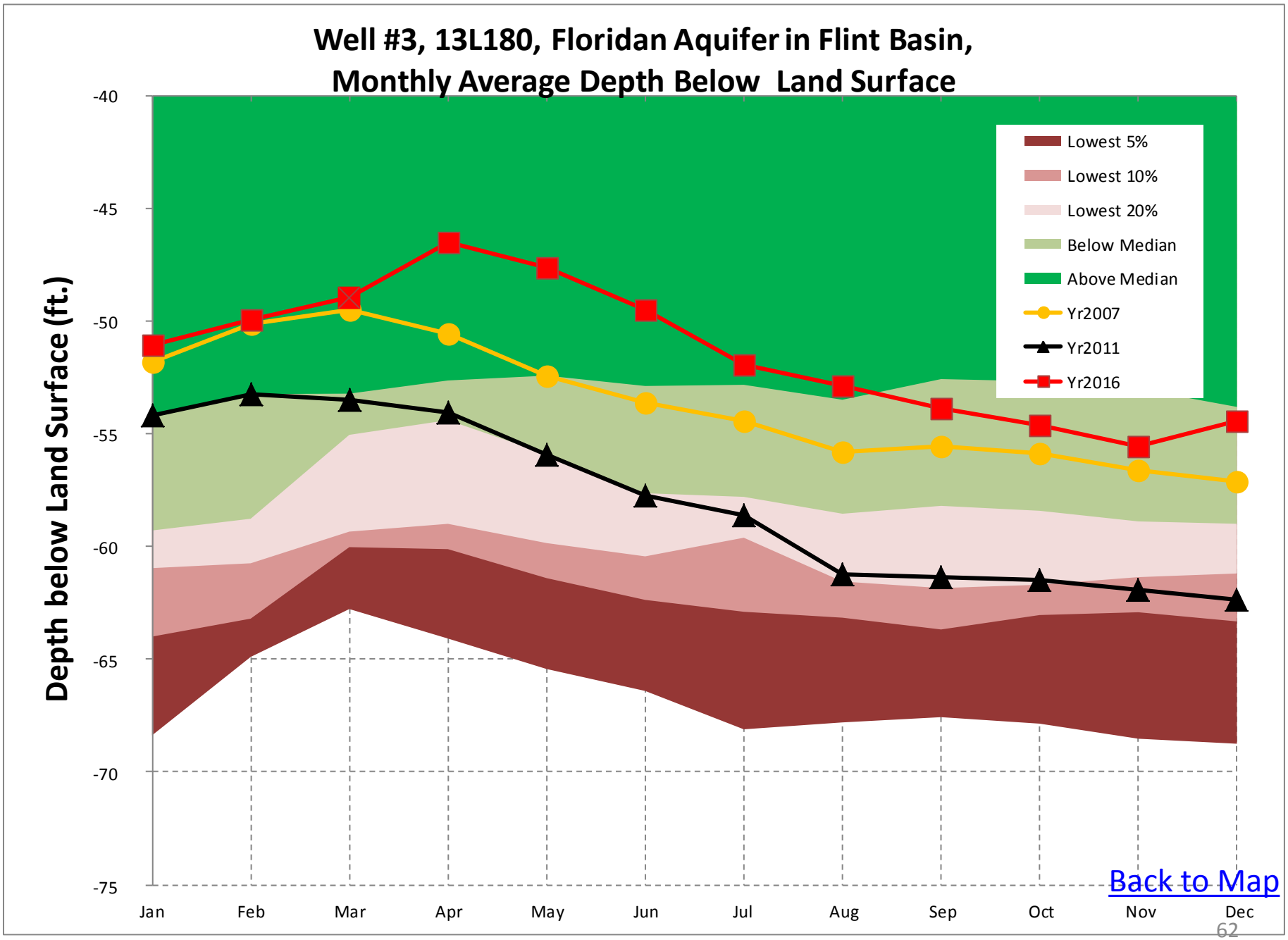
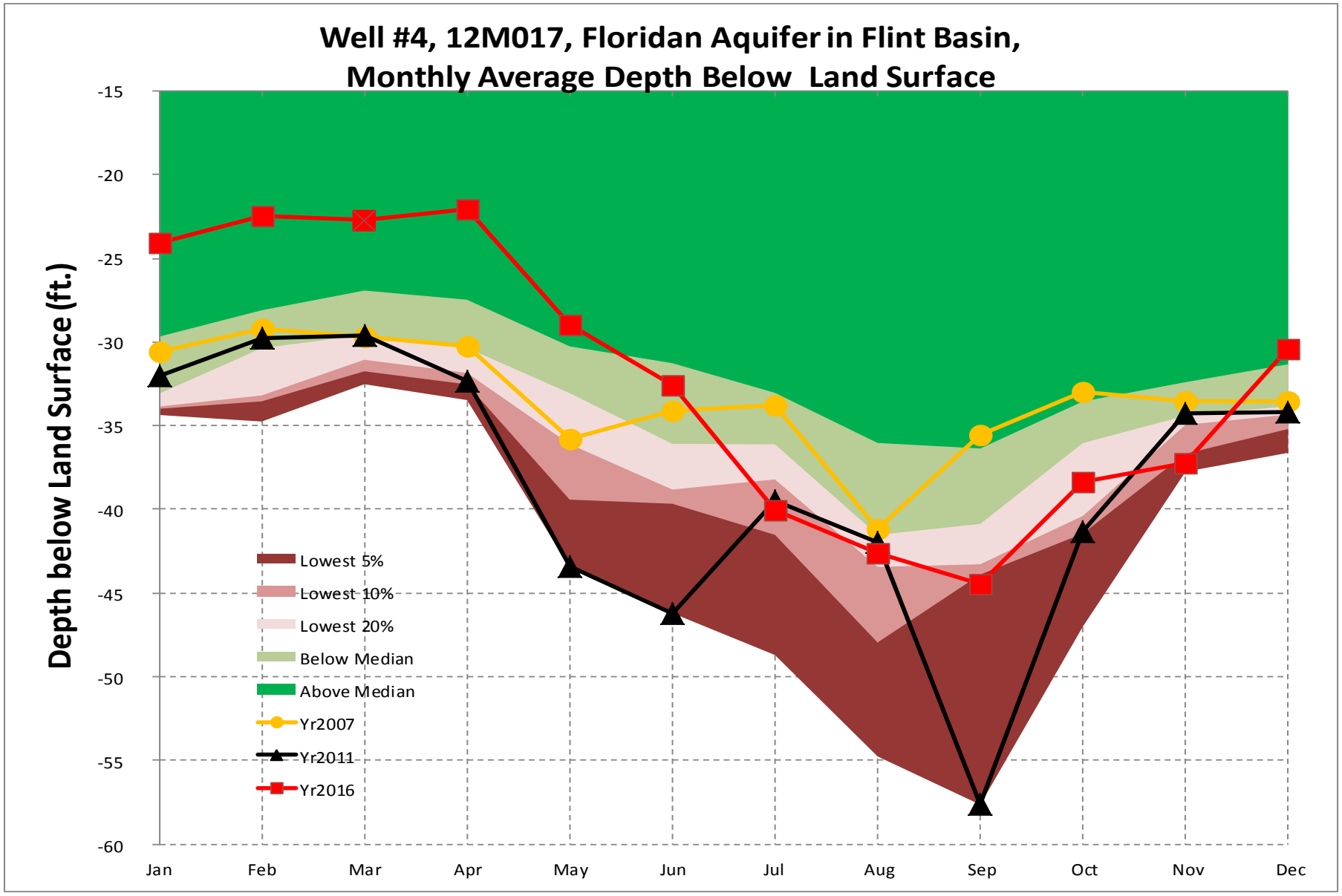
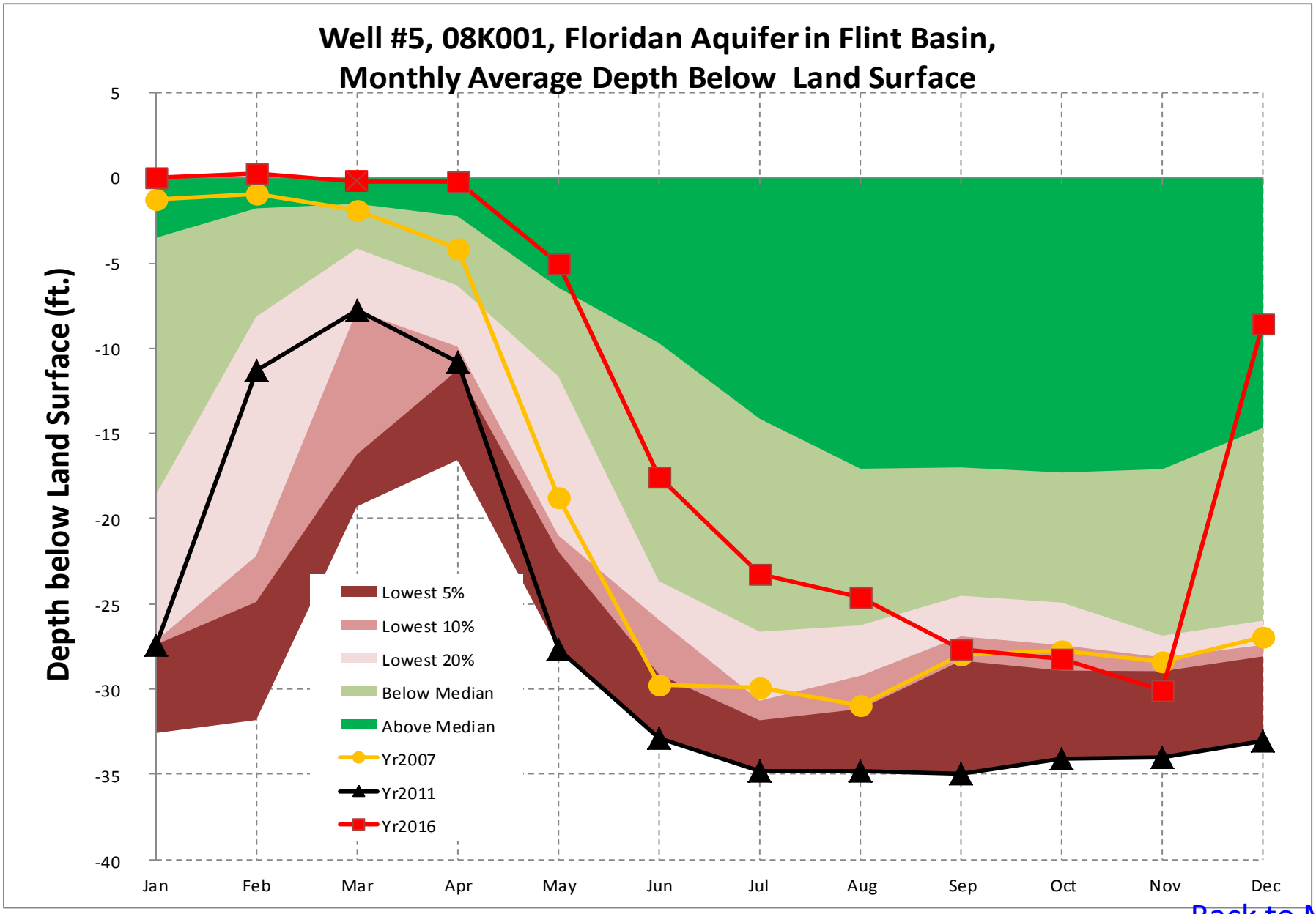

Well #3, 13L180, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-40
-45
-50
-55
-60
-65
-70
-75
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2016

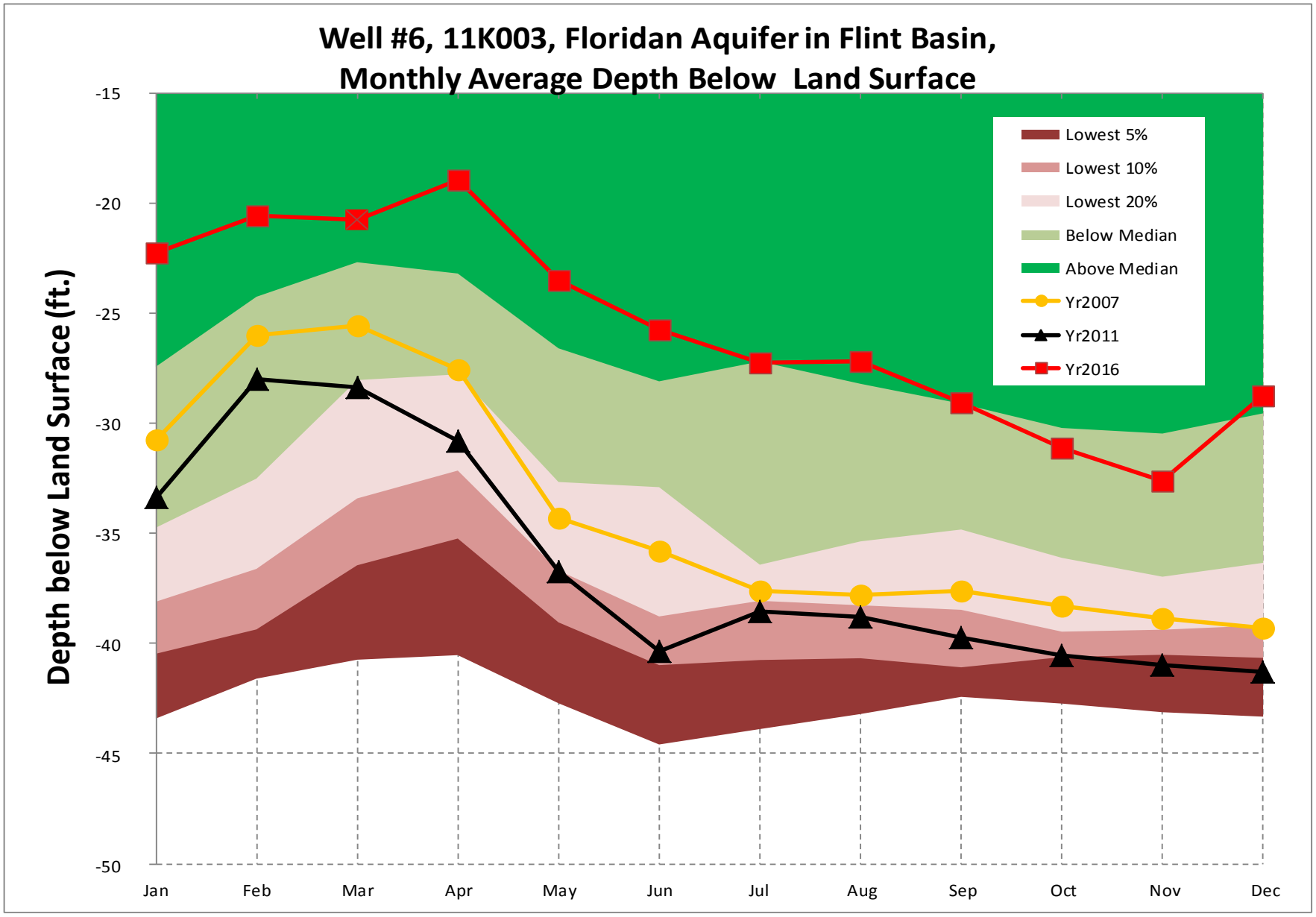
Back to Map


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
Yr2016

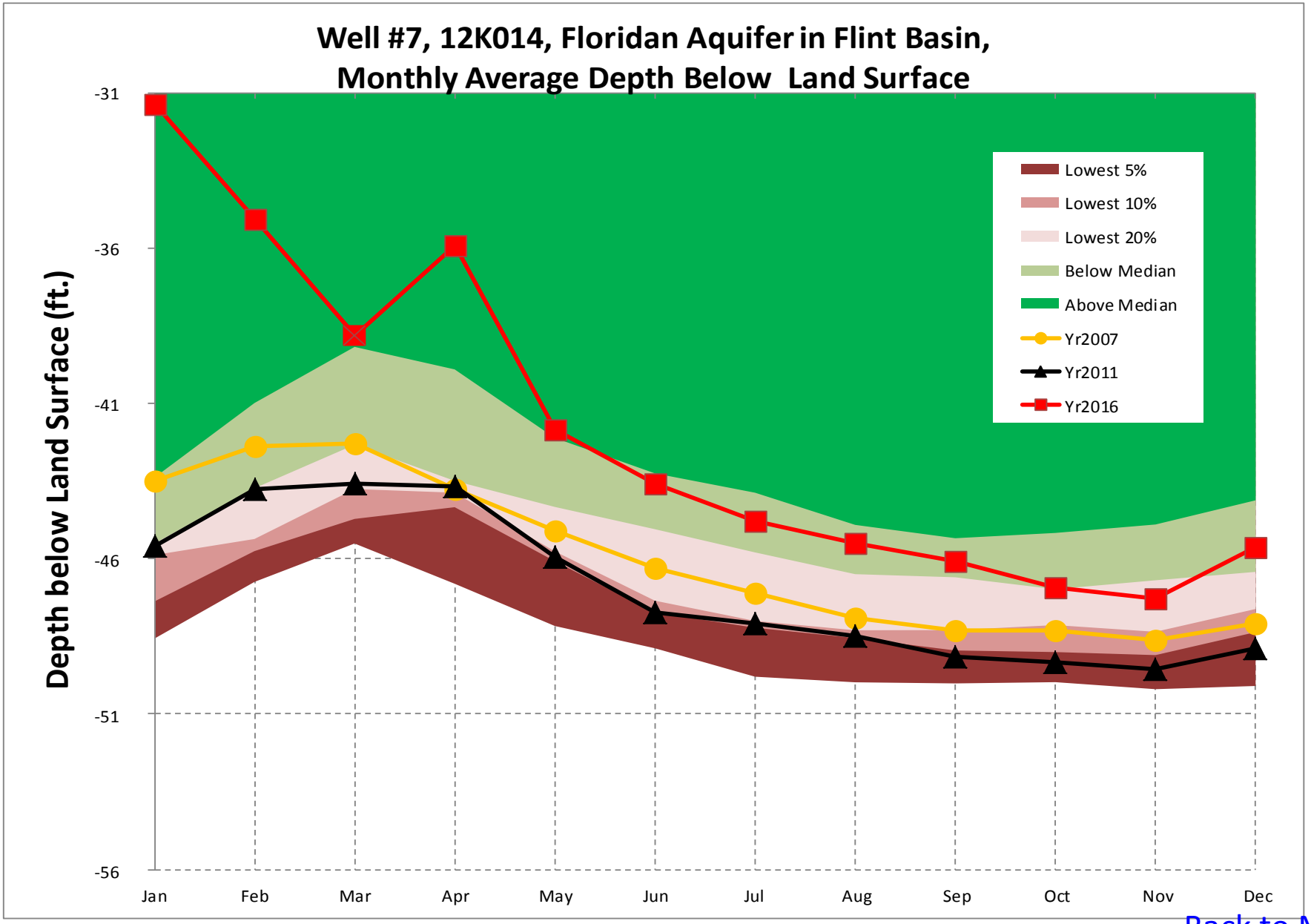
Back to Map


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
Yr2016

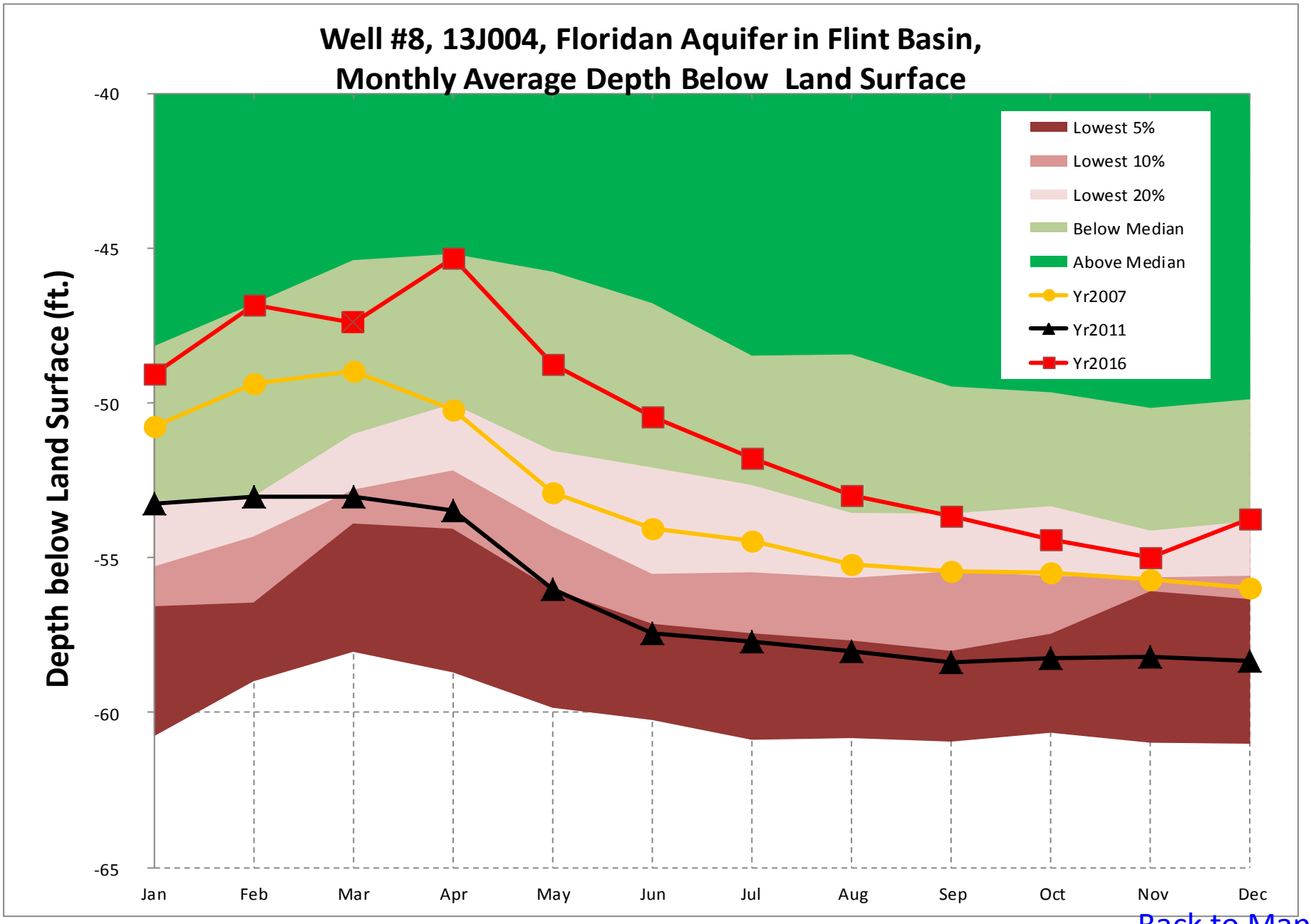
Back to Map


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
Yr2016

Back to Map


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
Yr2016

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 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2016

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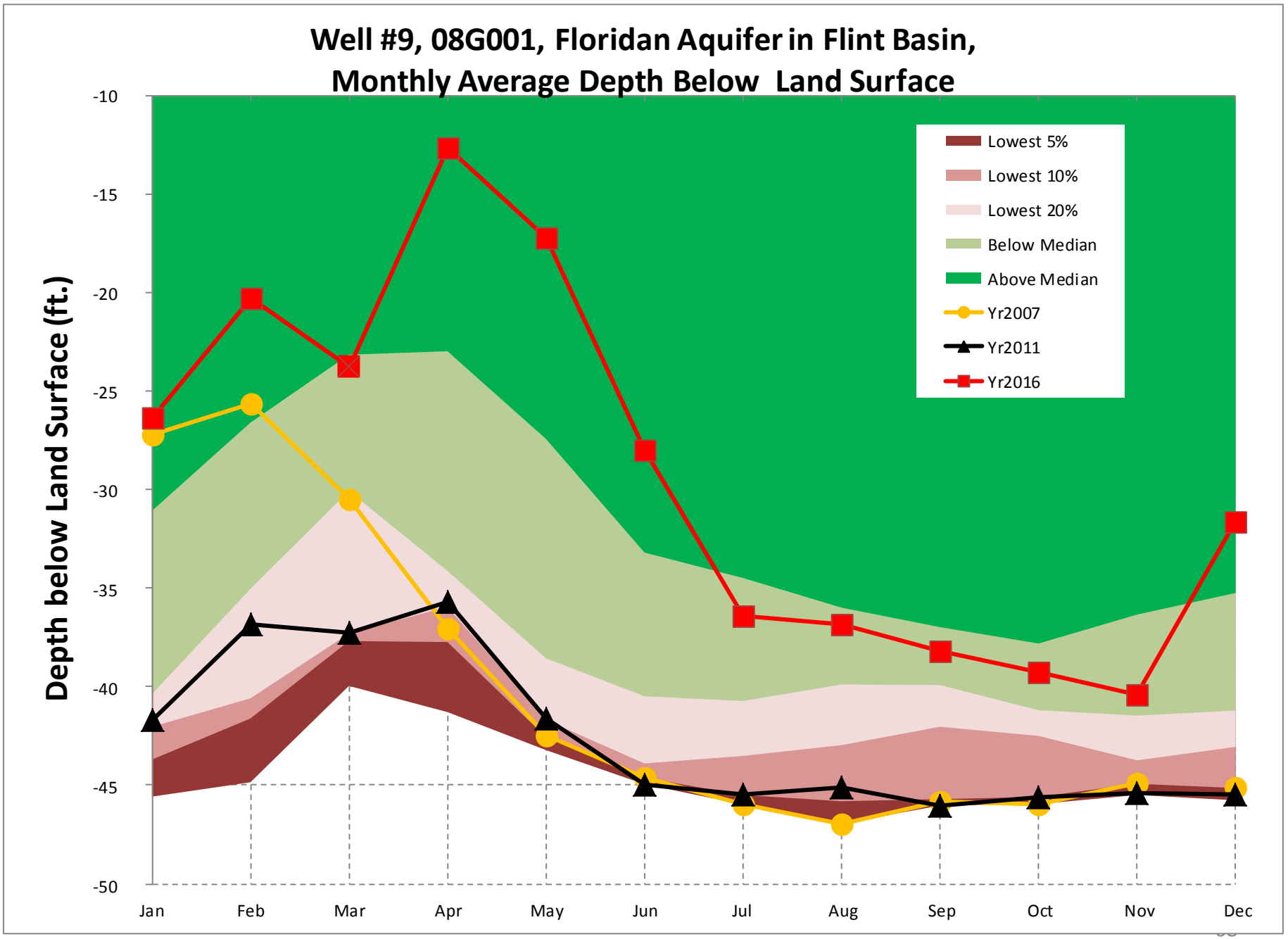
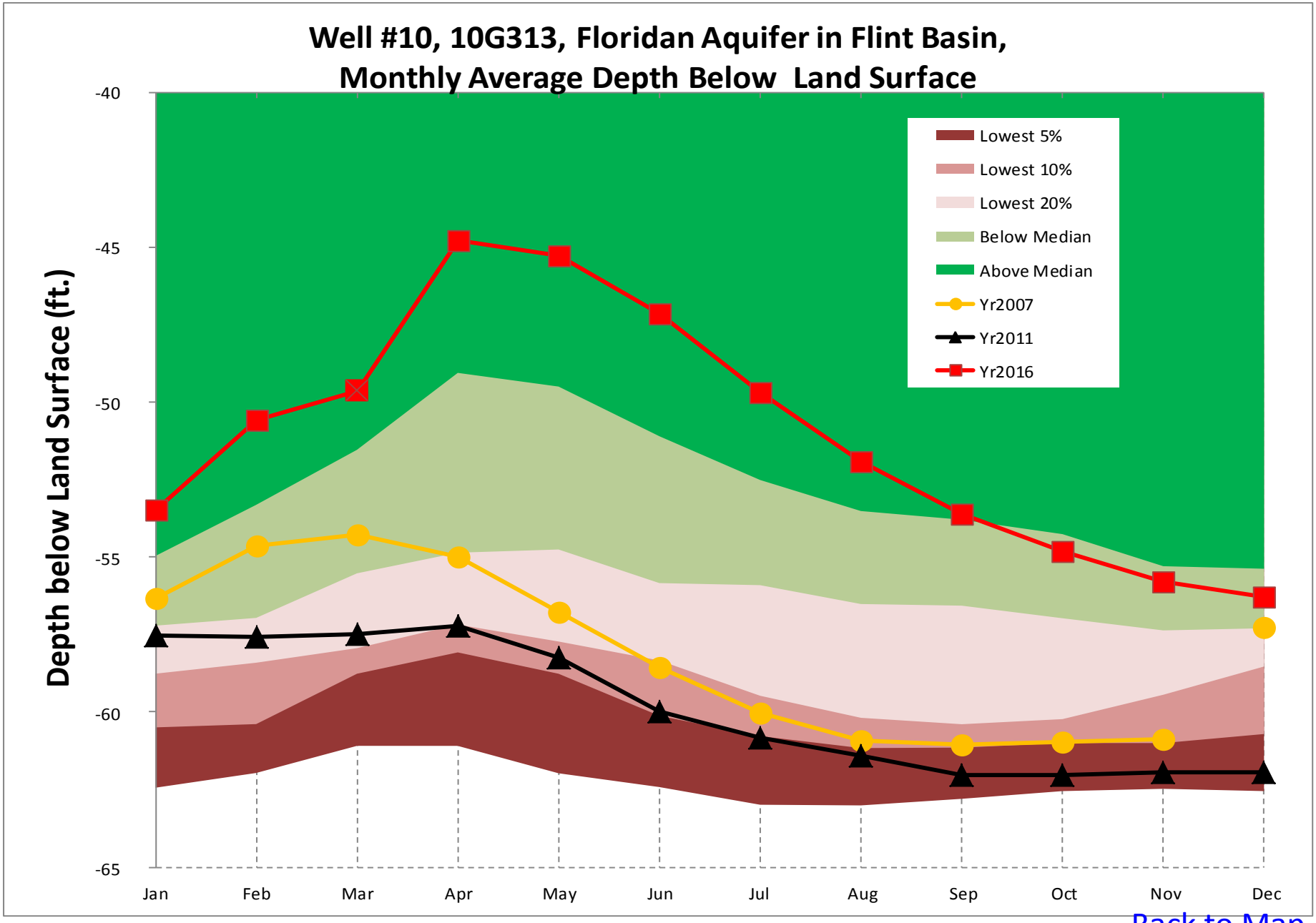
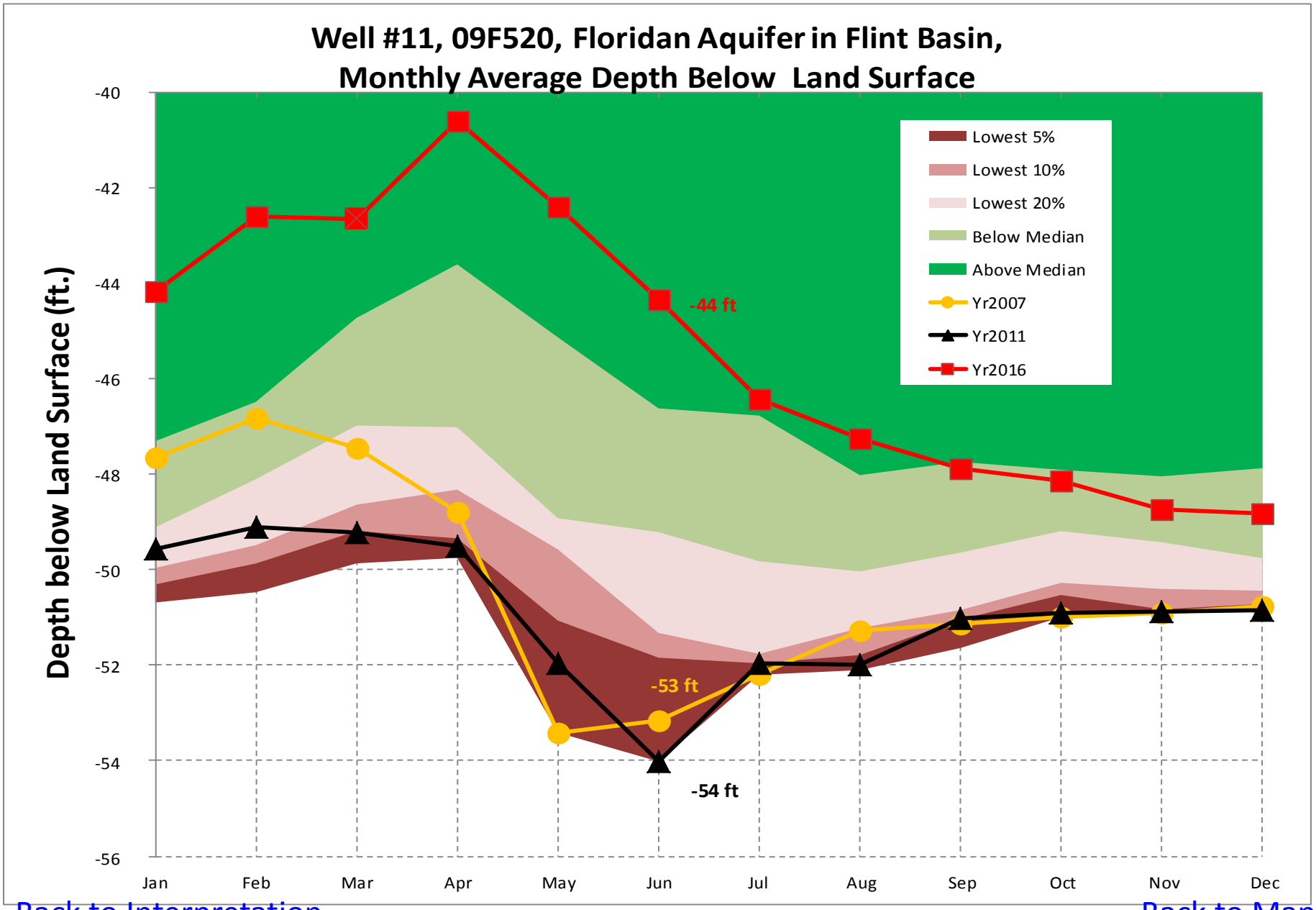

Well #9, 08G001, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-10
-15
-20
-25
-30
-35
-40
-45
-50
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2016


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
Yr2016

Back to Map

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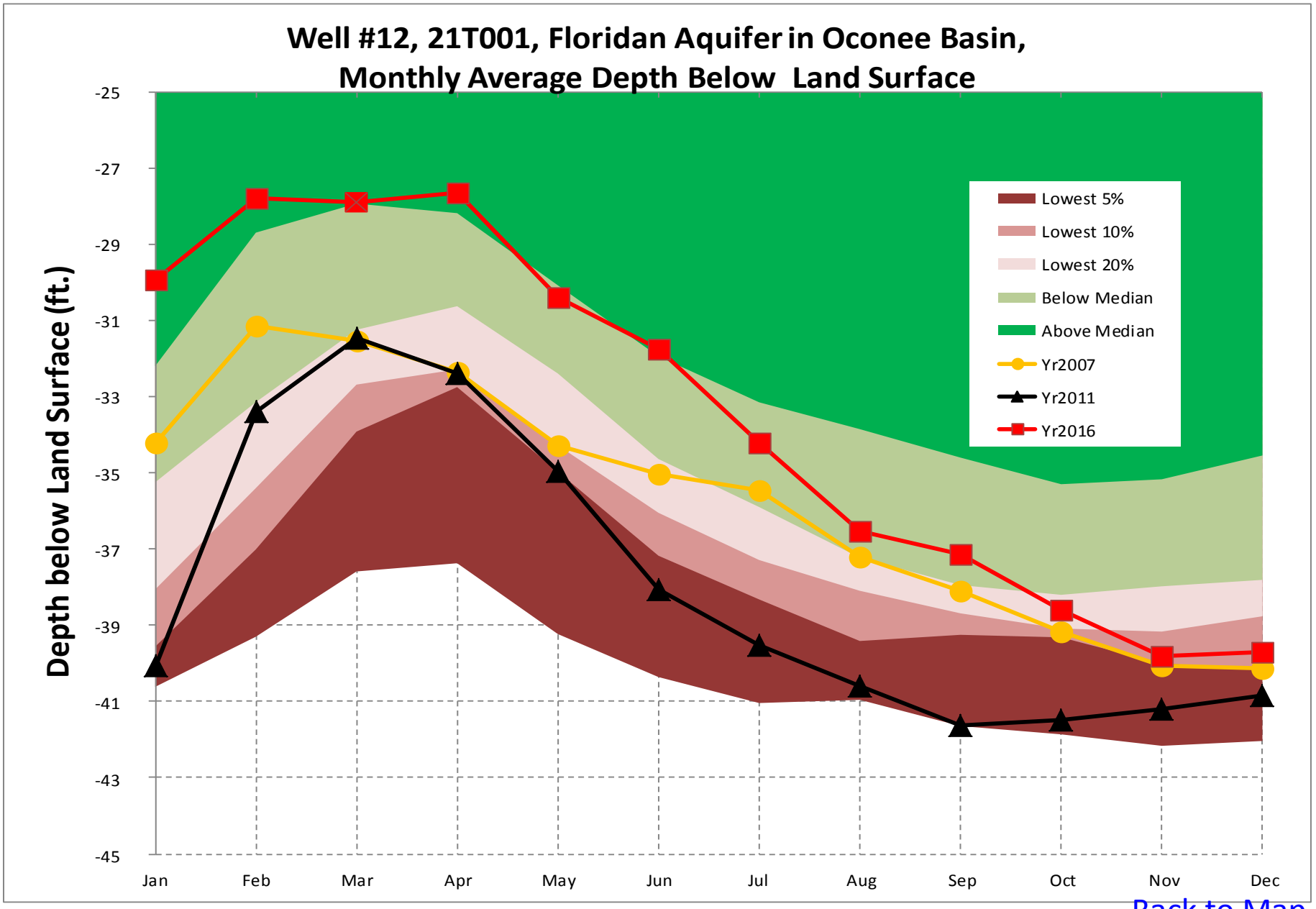
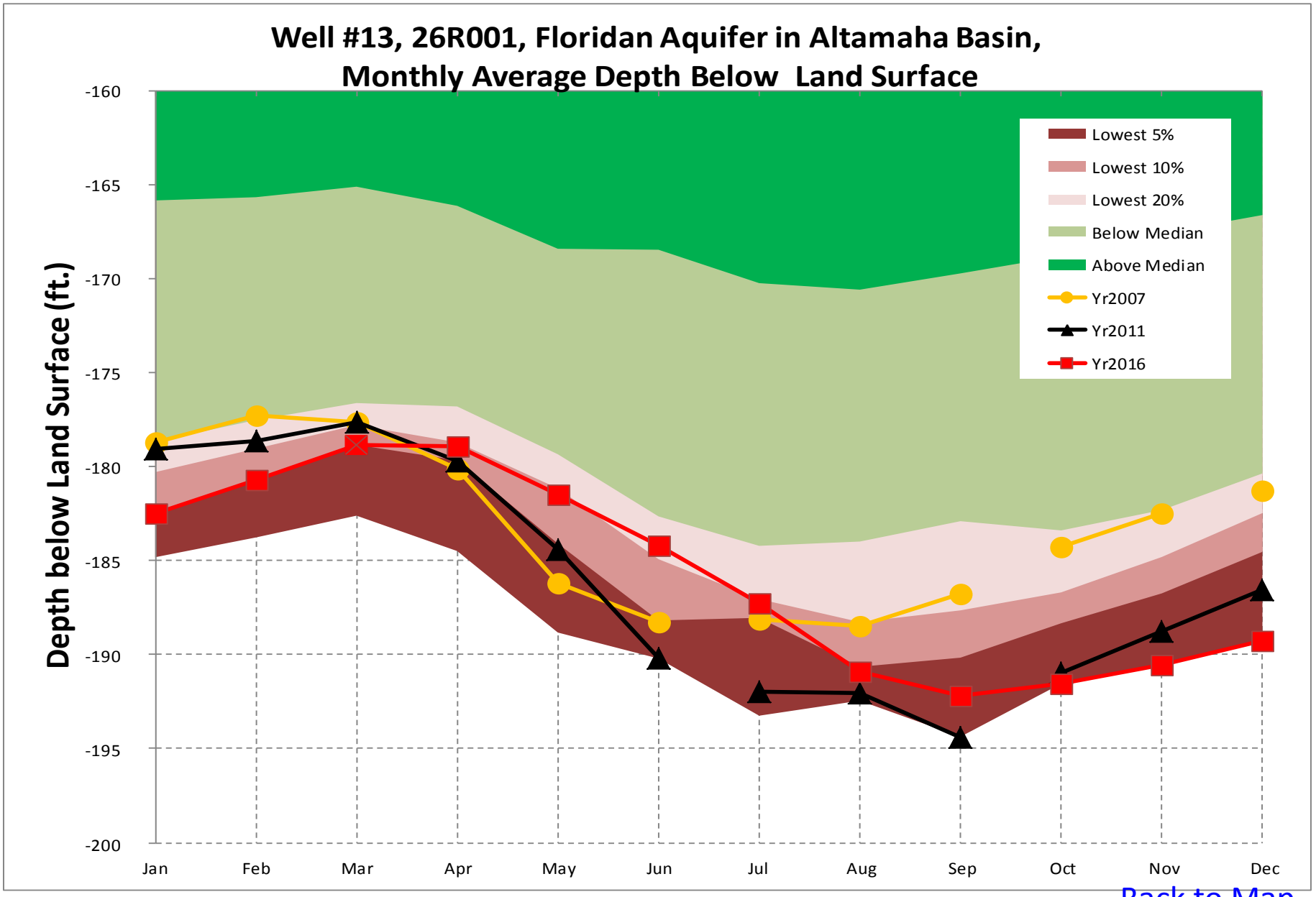

Well #12, 21T001, Floridan Aquifer in Oconee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-25
-27
-29
-31
-33
-35
-37
-39
-41
-43
-45
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2016

Back to Map


Well #13, 26R001, Floridan Aquifer in Altamaha Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-160
-165
-170
-175
-180
-185
-190
-195
-200
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2016

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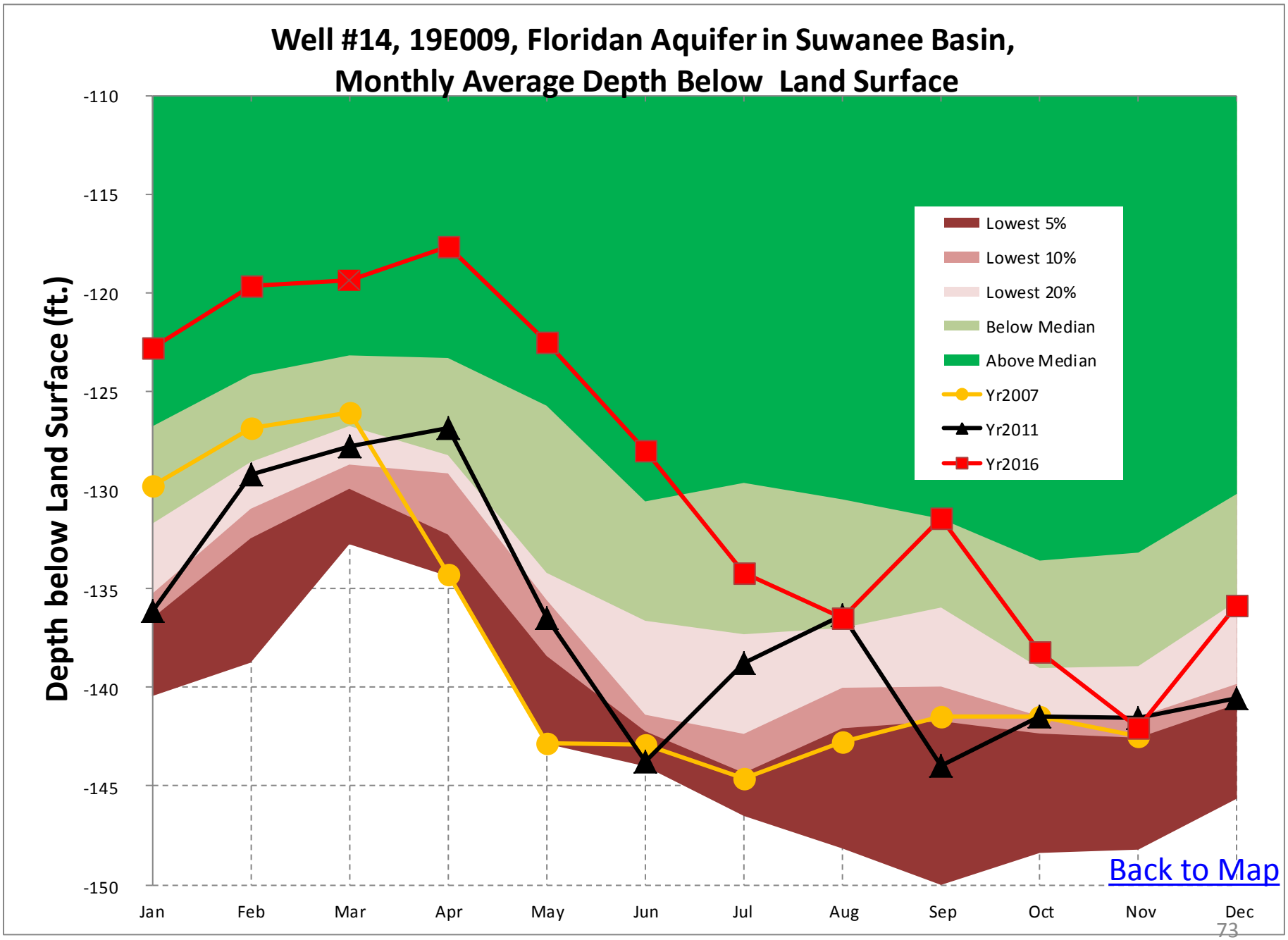
Well #14, 19E009, Floridan Aquifer in Suwanee Basin,
Monthly Average Depth Below Land Surface
Depth below Land Surface (ft.)
-110
-115
-120
-125
-130
-135
-140
-145
-150
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2016
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# Reservoir Levels

Data Source:
US Army Corps of Engineers

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

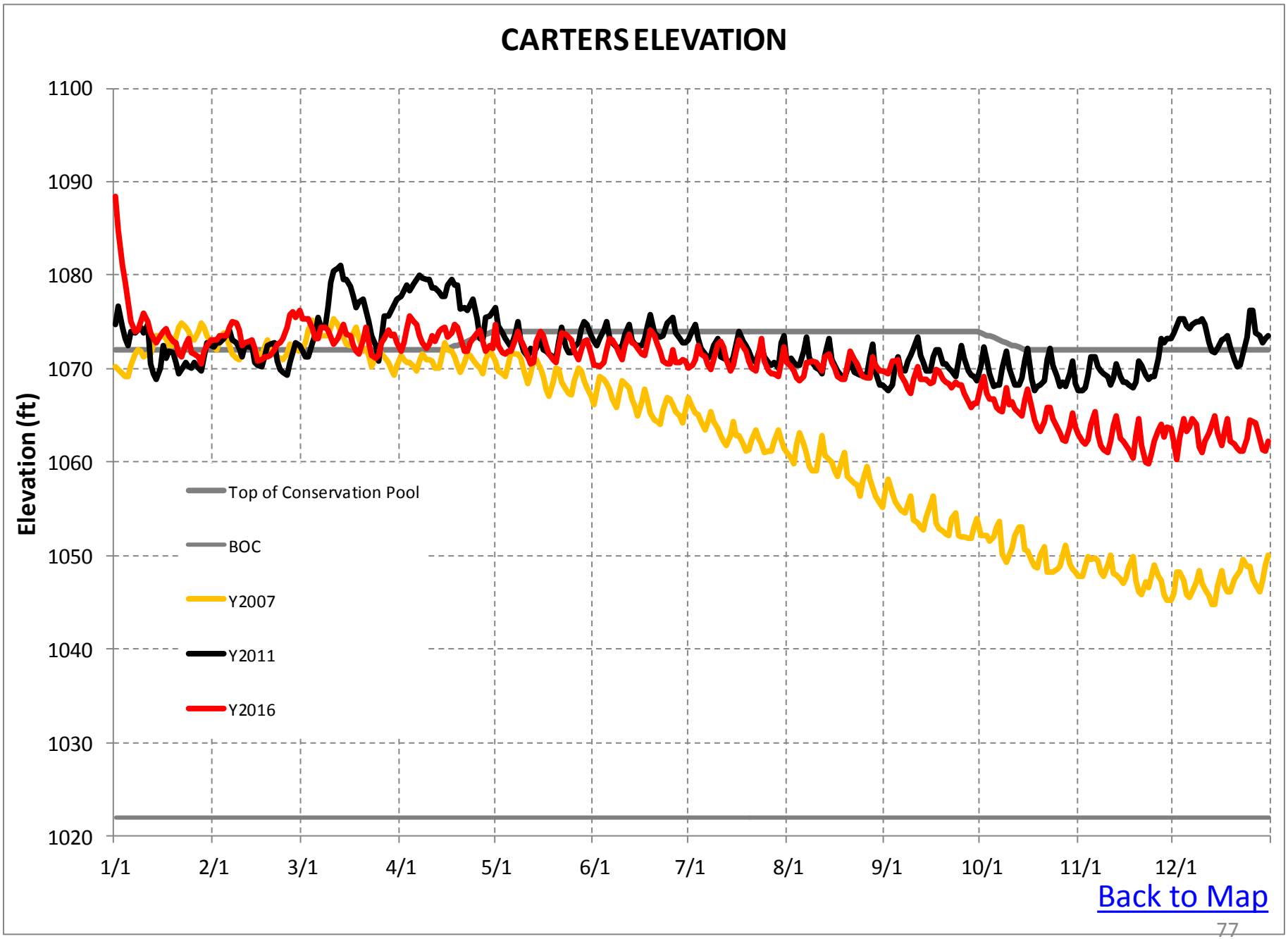
**Chattahoochee Basin**
3. Lanier
4. West Point
5. W.F. George

**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, 2016 through December, 2016.
- 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 2016 reservoir elevations into perspective, elevations for 2007 and 2011 are also shown.


CARTERS ELEVATION
Elevation (ft)
1100
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
BOC
Y2007
Y2011
Y2016

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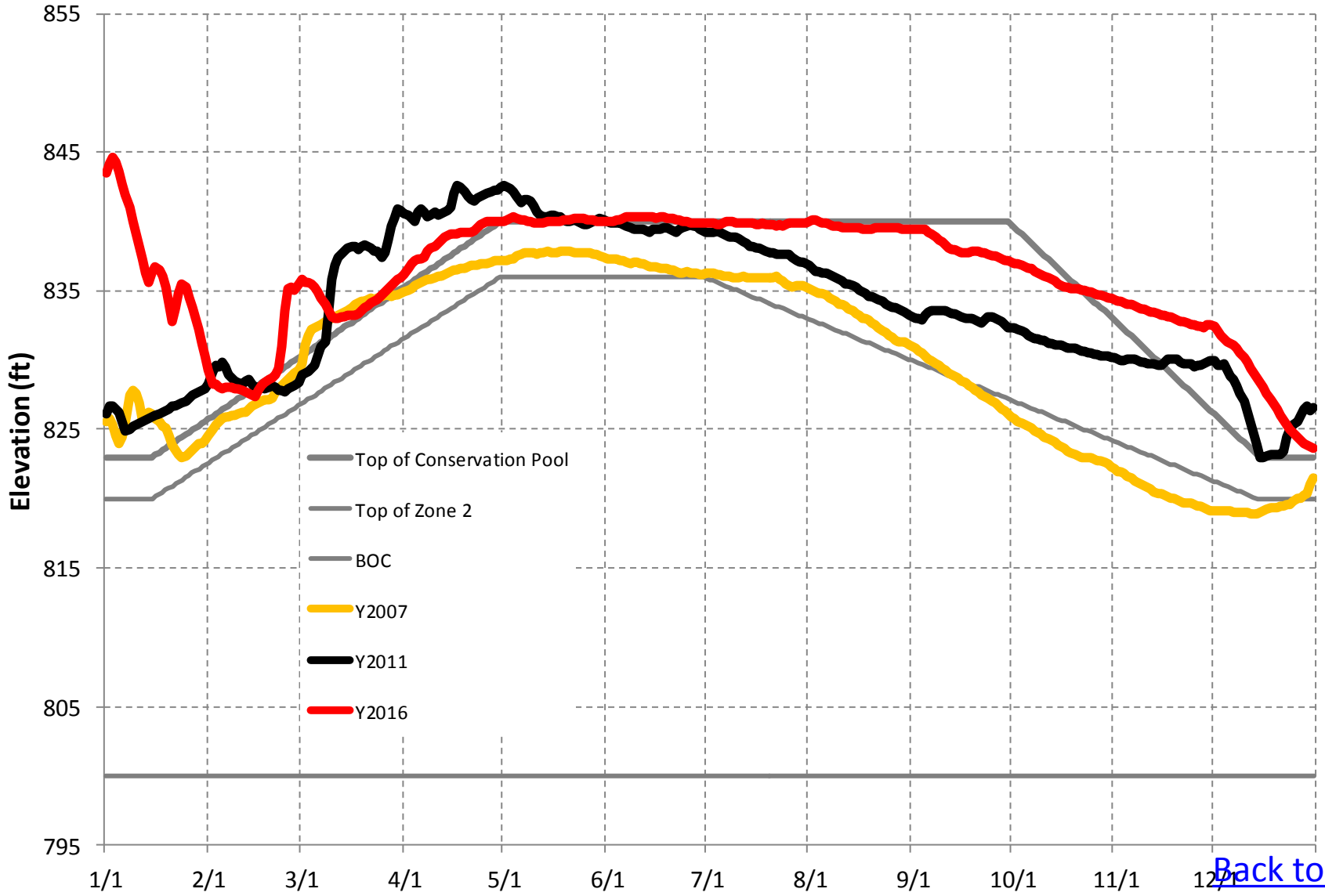
# ALLATOONA ELEVATION

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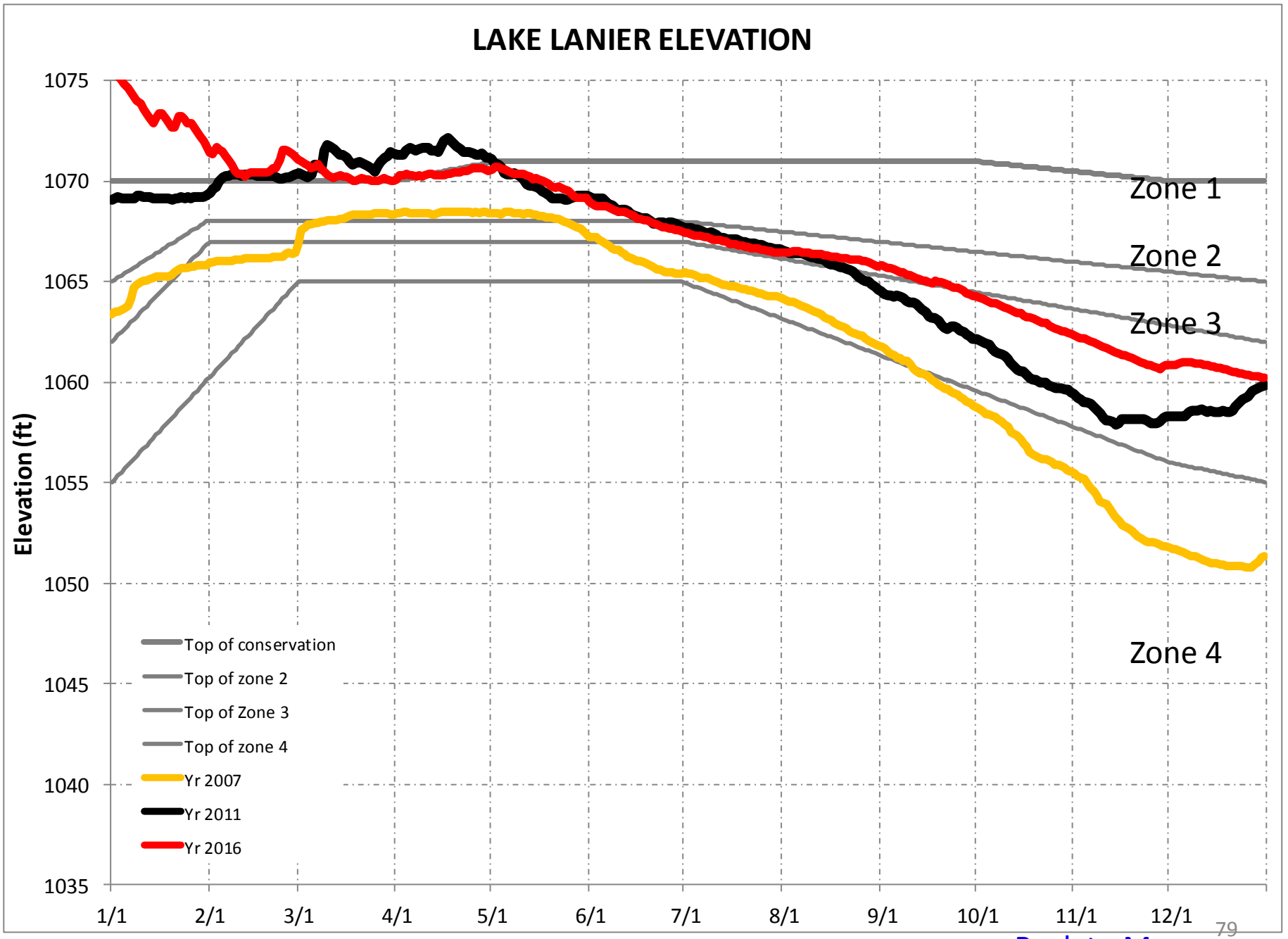
LAKE LANIER ELEVATION
Elevation (ft)
1075
1070
1065
1060
1055
1050
1045
1040
1035
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Yr 2007
Yr 2011
Yr 2016



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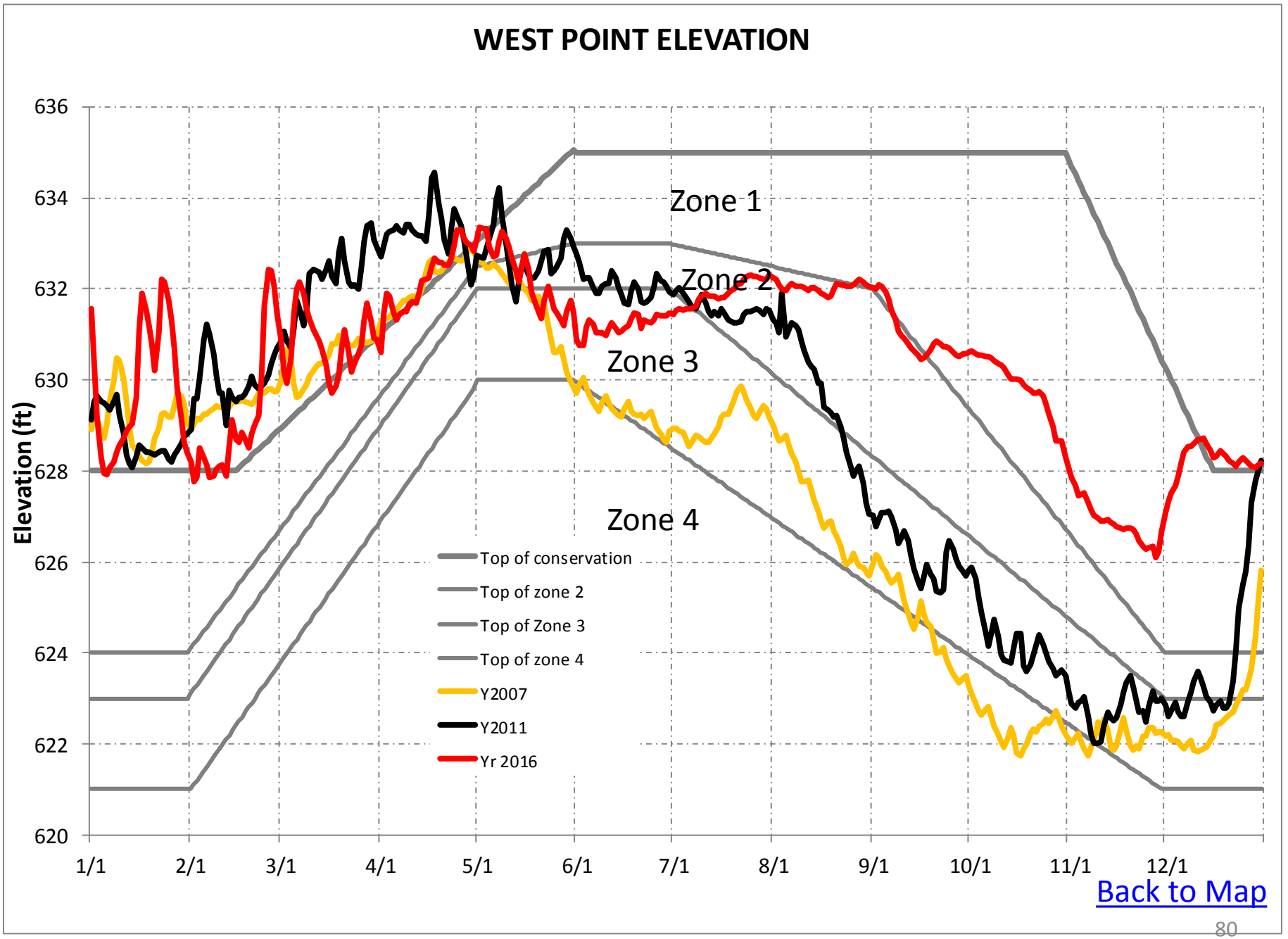
WEST POINT ELEVATION
Elevation (ft)
636
634
632
630
628
626
624
622
620
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Y2007
Y2011
Yr 2016

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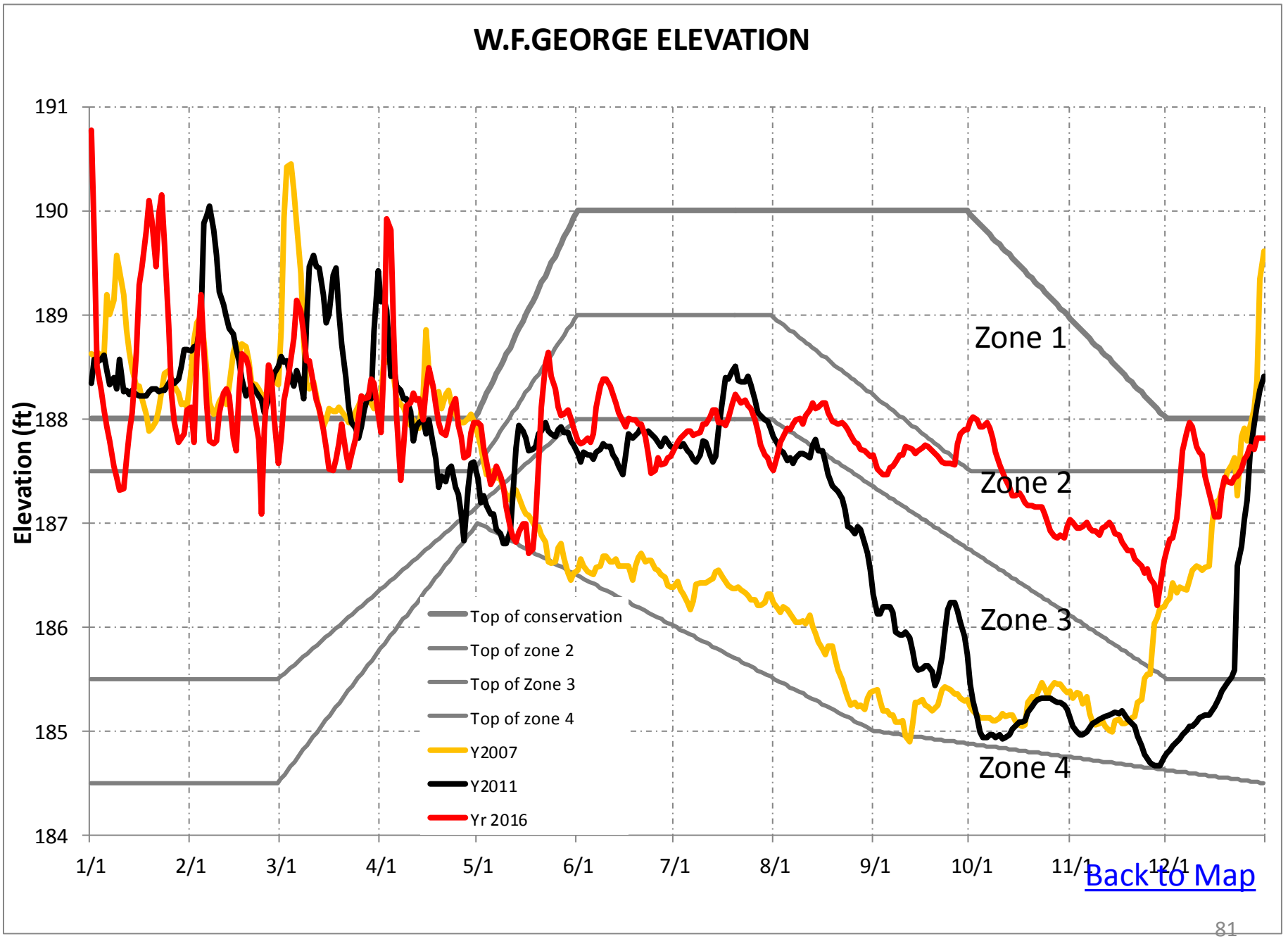
W.F.GEORGE ELEVATION
Elevation (ft)
191
190
189
188
187
186
185
184
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
Zone 1
Zone 2
Zone 3
Zone 4
Top of conservation
Top of zone 2
Top of Zone 3
Top of zone 4
Y2007
Y2011
Yr 2016

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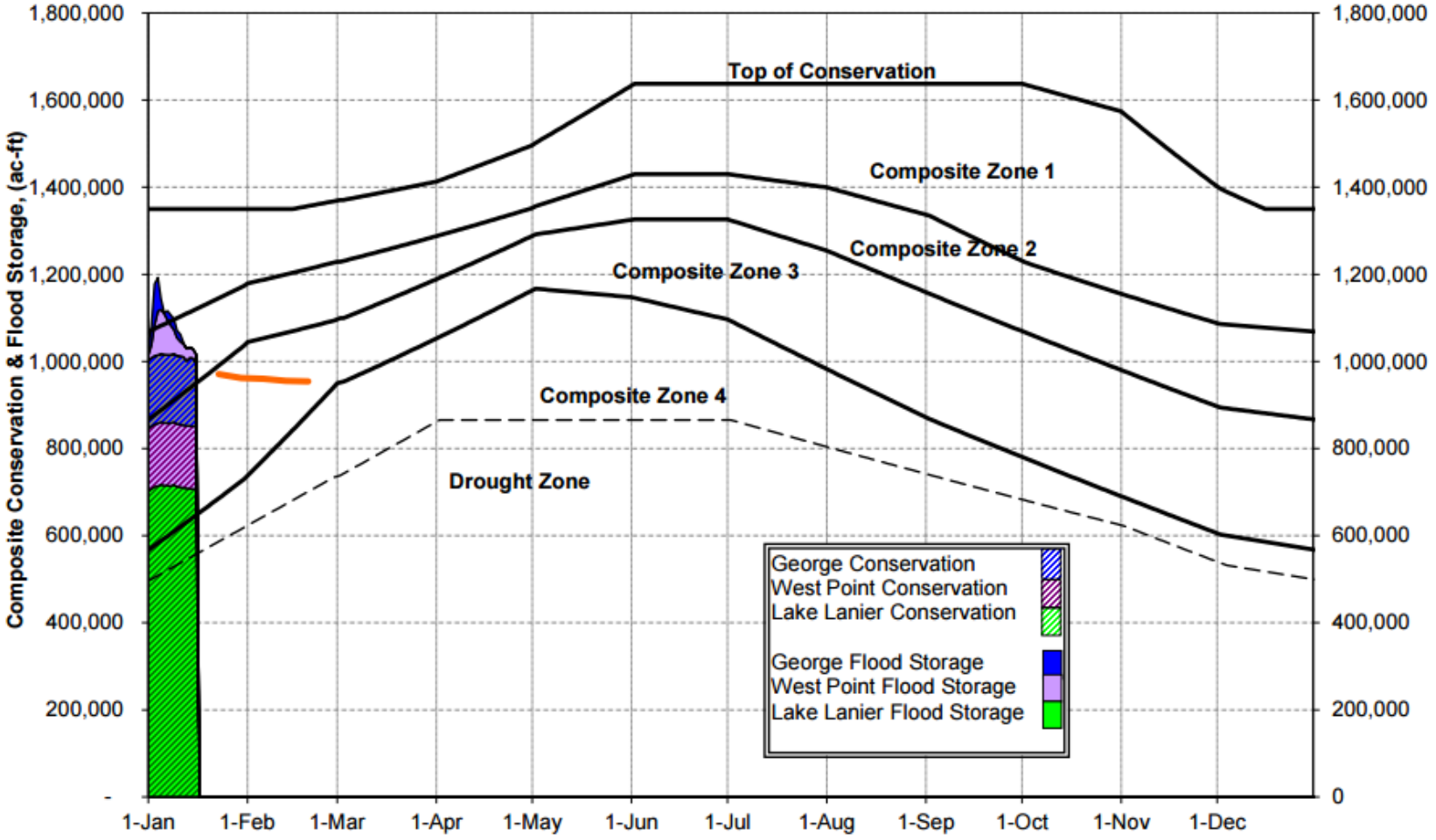
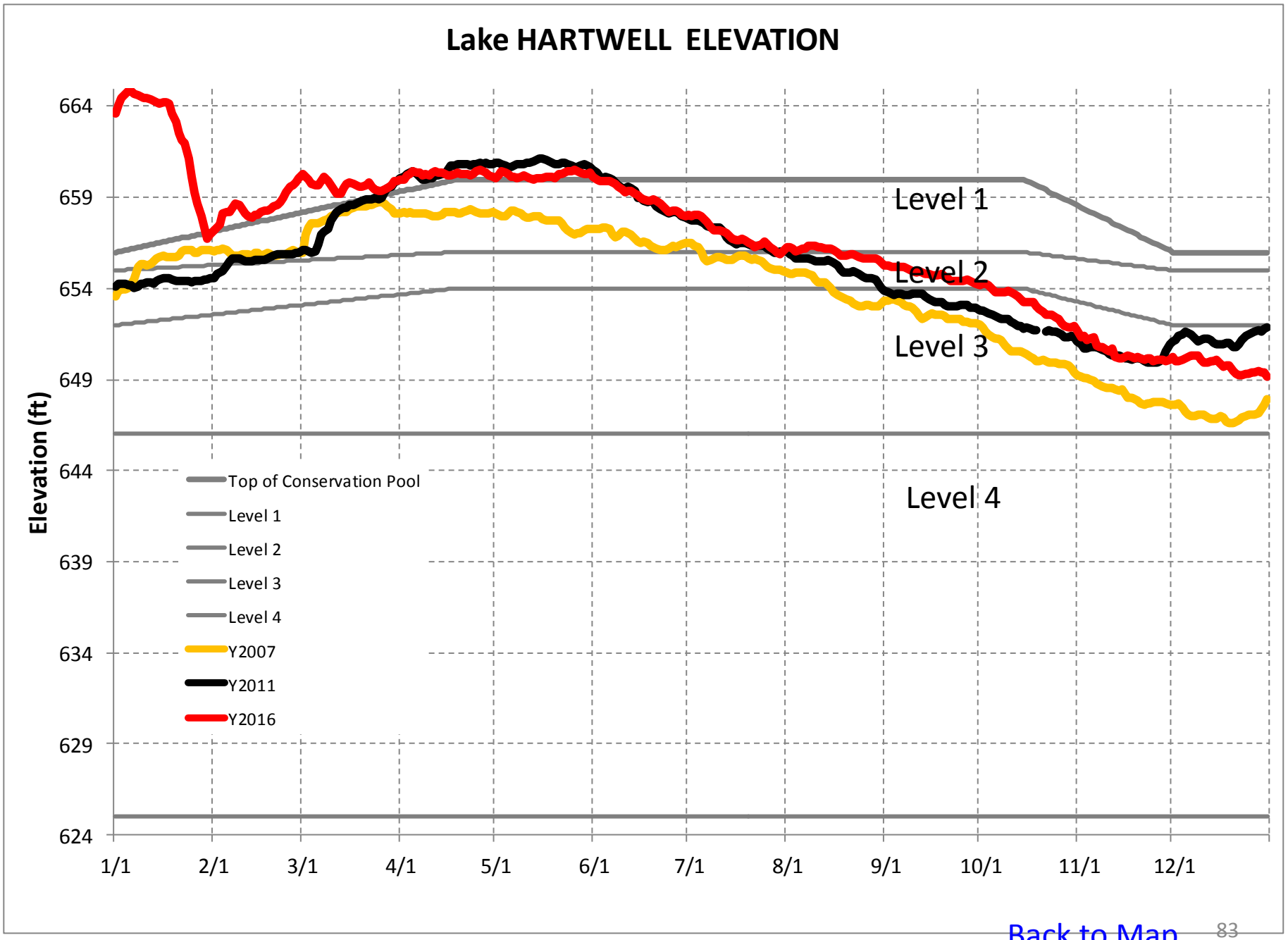
# 2017 ACF Basin Composite Conservation and Flood Storage




Actual data thru 1-17-2017

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


Lake HARTWELL ELEVATION
Elevation (ft)
664
659
654
649
644
639
634
629
624
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
Level 4
Top of Conservation Pool
Level 1
Level 2
Level 3
Level 4
Y2007
Y2011
Y2016

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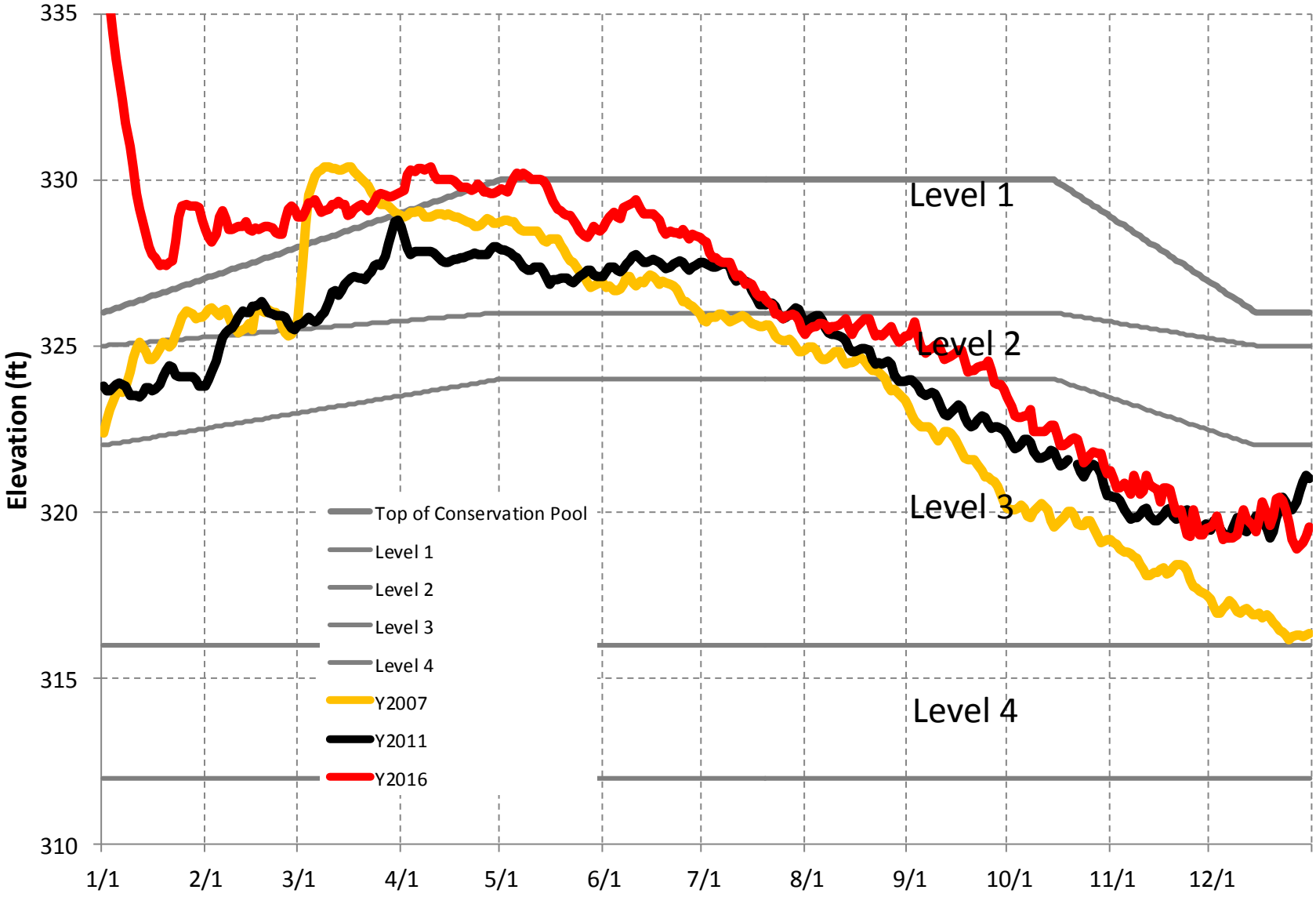
# LAKE CLARK HILL (THURMOND) ELEVATION

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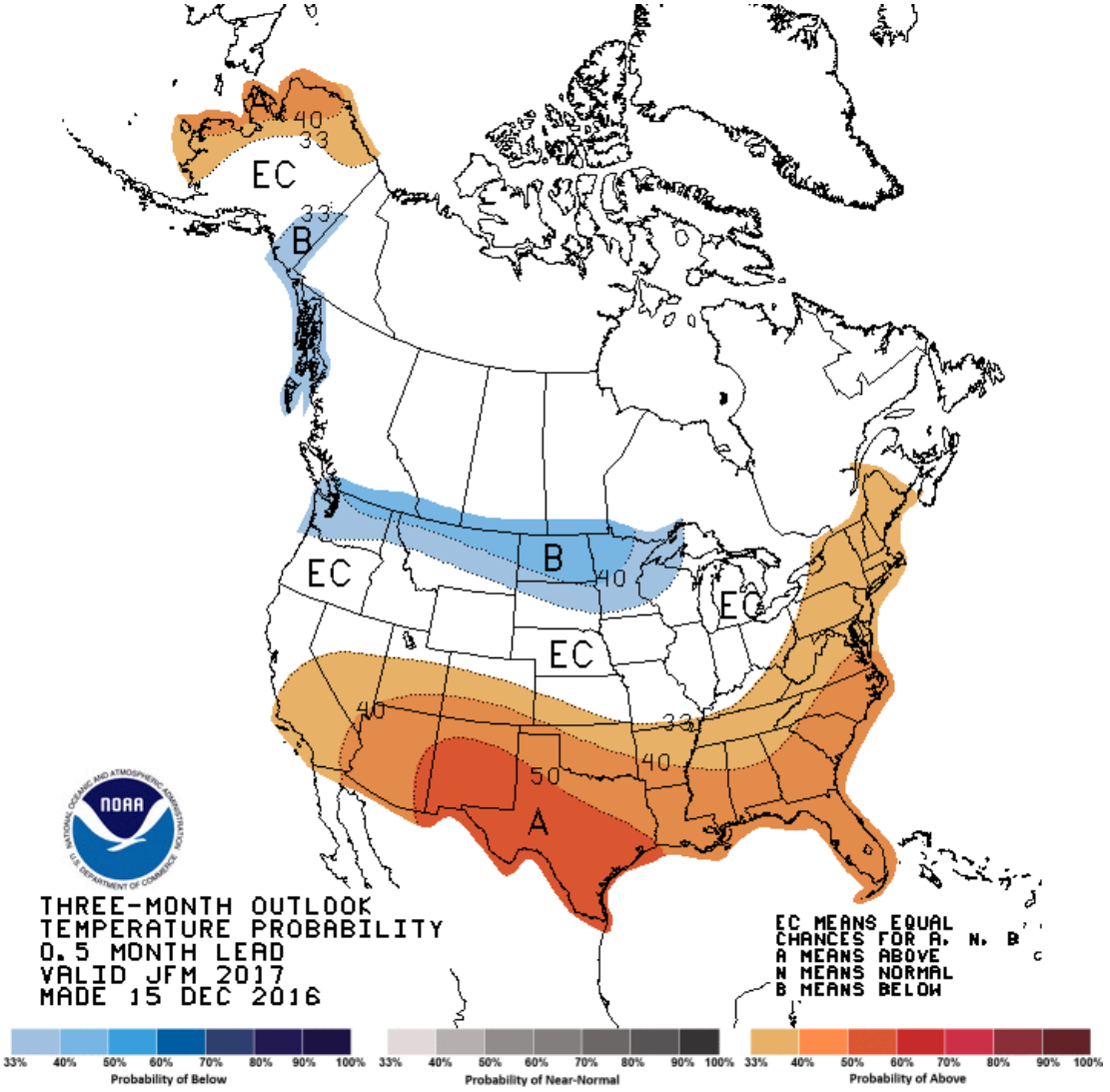
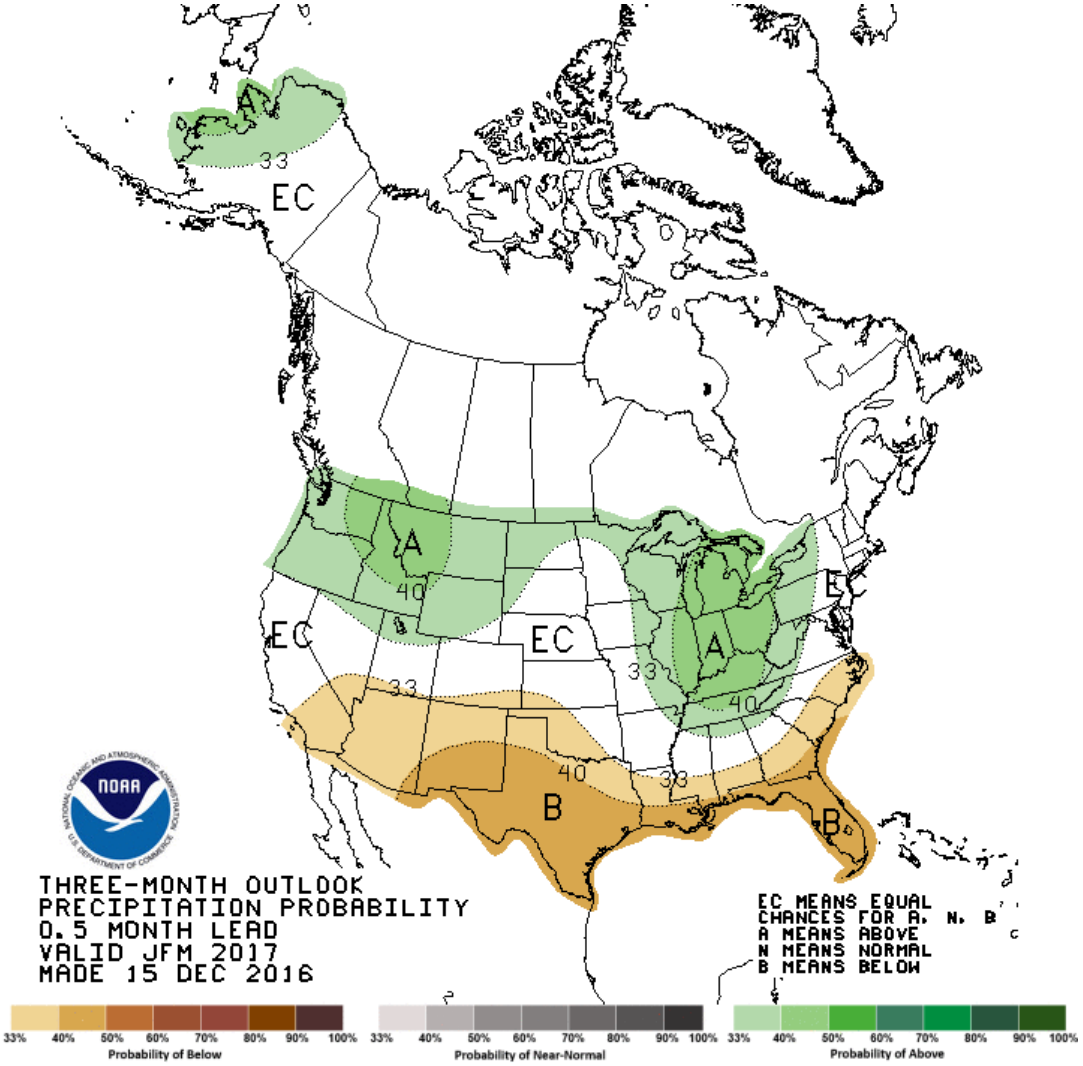
# Climate Prediction Center 3-month Temperature and Precipitation Probability Outlook and Seasonal Drought Outlook

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

# Temperature Outlook



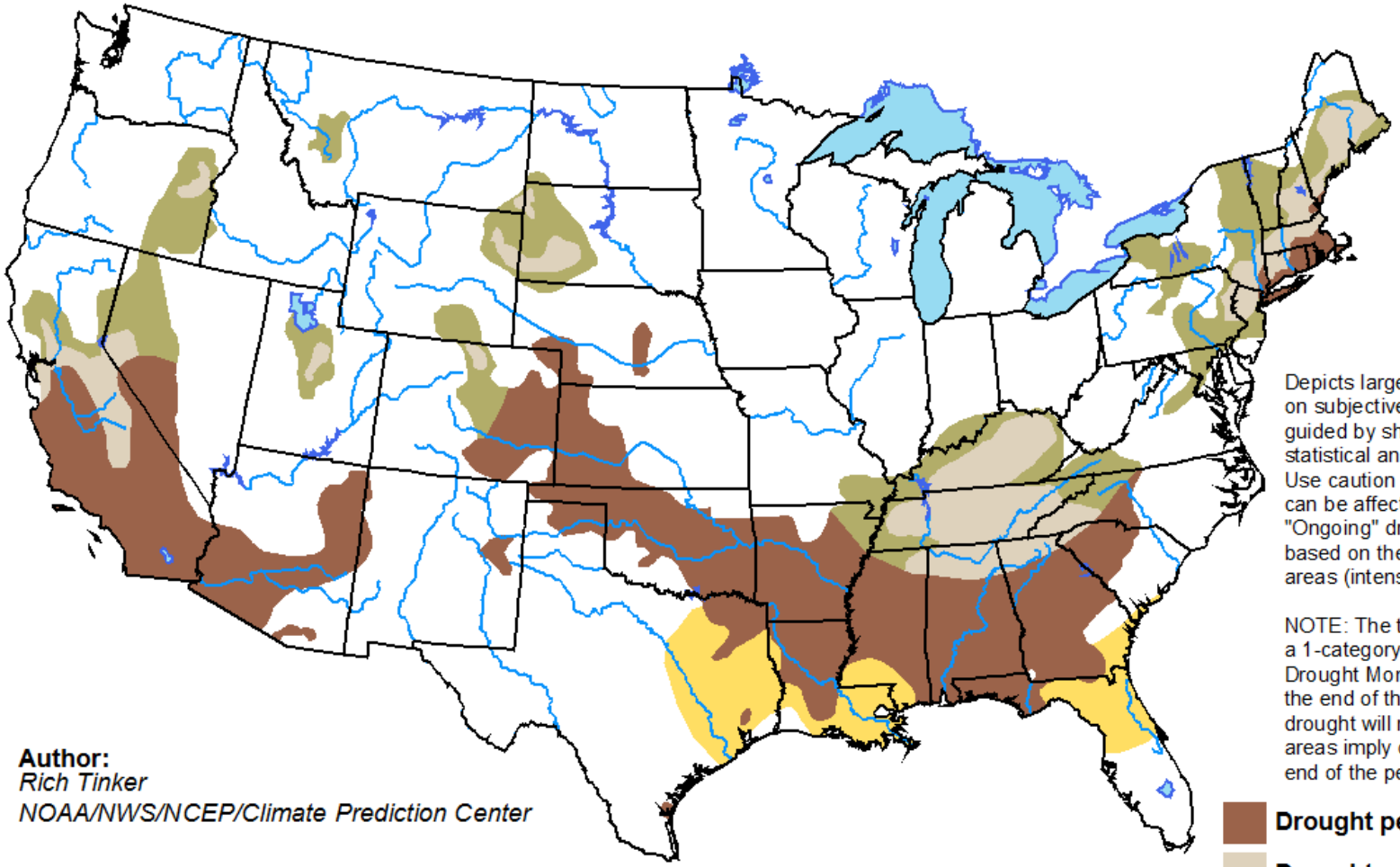
# Precipitation Outlook



# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

***Valid for December 15 - March 31, 2017***
***Released December 15, 2016***



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).

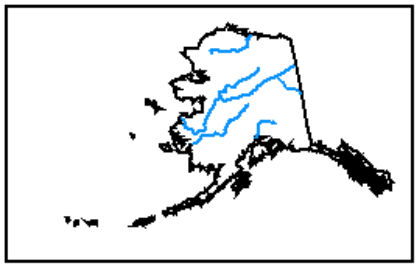
**Drought persists**

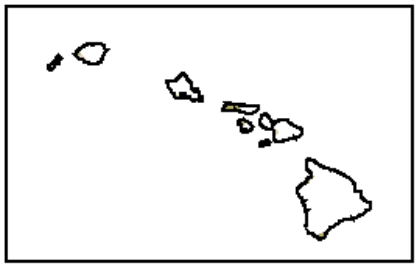
**Drought remains but improves**

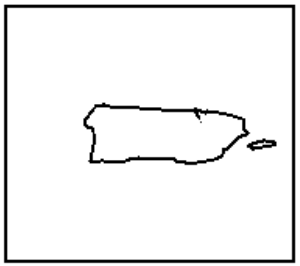
**Drought removal likely**

**Drought development likely**

**Author:**
*Rich Tinker*
*NOAA/NWS/NCEP/Climate Prediction Center*







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