Drought Indicators Report

Georgia Environmental Protection Division
January 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 December 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 24, 2019.
U.S. Drought Monitor — No dry conditions present in Georgia as of January 24, 2019.

Precipitation — Precipitation across Georgia has been above normal for the past three months, and close to normal when looked at for six months or twelve months back.

Soil Moisture — Soil moisture conditions have been in normal range (30 to 70 percentile) in south and southeast Georgia and above normal (better than 70 percentile) for the northern part of the state.
Drought Indicator Analysis Summary (slide 2 of 2)

- **Streamflow** – Stream flows observed at selected USGS gages have been above normal for the past three months.

- **Groundwater Levels** – Groundwater levels observed at selected wells are above normal or near normal.

- **Reservoir Levels** – All federal reservoirs in Georgia (ACF, ACT, and Savannah River Basins) are at levels above their respective top of conservation (normal) pools.

- **Short-term Climate Prediction** – National Climatic Prediction Center projects colder than normal temperatures for north Georgia and wetter than normal precipitations in south Georgia for the months of February, March, and April 2019.

- **Water Supplies** – No issues with water availability to water supply providers.
US Drought Monitor

Data Source:
http://droughtmonitor.unl.edu/
U.S. Drought Monitor

Georgia

January 22, 2019
(Released Thursday, Jan. 24, 2019)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

<table>
<thead>
<tr>
<th>Current</th>
<th>None</th>
<th>D0-D4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
<th>D4</th>
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<tbody>
<tr>
<td>Last Week</td>
<td>100.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>01-12-2019</td>
<td>100.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>3 Months Ago</td>
<td>66.79</td>
<td>33.21</td>
<td>3.58</td>
<td>0.00</td>
<td>0.00</td>
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<td>10-23-2018</td>
<td>66.79</td>
<td>33.21</td>
<td>3.58</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<td>Start of Water Year</td>
<td>70.95</td>
<td>29.05</td>
<td>6.72</td>
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<td>0.00</td>
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<td>09-23-2018</td>
<td>70.95</td>
<td>29.05</td>
<td>6.72</td>
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<tr>
<td>One Year Ago</td>
<td>0.35</td>
<td>99.65</td>
<td>54.62</td>
<td>17.88</td>
<td>0.00</td>
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<tr>
<td>01-01-2018</td>
<td>0.35</td>
<td>99.65</td>
<td>54.62</td>
<td>17.88</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Intensity:
- Yellow: D0 Abnormally Dry
- Red: D3 Extreme Drought
- Orange: D1 Moderate Drought
- Brown: D4 Exceptional Drought
- Brown: D2 Severe Drought

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

Author:
Brian Fuchs
National Drought Mitigation Center

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

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

• For each of the 34 gages, EPD has prepared a graph that shows monthly average streamflow from January, 2018 through December, 2018;
• 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 2018 was 2,620 cfs. The statistical composite of all historical data for this gage shows that average streamflow in December has historically been lower than December 2018 about 95% of the time; about 5% 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 35% of the time; 65% of the time in December it has been higher.

– Average stream flow in December 2007 was 342 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 1% of the time; 99% 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](https://www.usgs.gov) shows:

- Average stream flow for December 2018 was 16,410 cfs. The statistical composite of all historical data for this gage shows that average streamflow in December has historically been lower than December 2018 about 95% of the time; about 5% of the time in December it has been higher.

- Average stream flow in December 2011 was 2,100 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 2% of the time; about 98% of the time in December it has been higher.

- Average stream flow in December 2007 was 2,463 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)

- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum
- Yr2007
- Yr2011
- Yr2018

Back to Map
Gage #2, USGS #03550500, Tennessee Basin,
NOTTELY RIVER NEAR BLAIRSVILLE, GA

Monthly Average Flow (cfs)

Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum

Data for Year 2007 not available

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Gage #4, USGS #02382200, Coosa Basin, TALKING ROCK CREEK NEAR HINTON, GA

Monthly Average Flow (cfs)

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

Monthly Average Flow (cfs)

[Graph showing monthly average flow with different lines and colors representing various categories such as Driest 50%, Driest 20%, Driest 10%, Driest 5%, Minimum, Yr2007, Yr2011, Yr2018, with months from Jan to Dec on the x-axis and flow values on the y-axis.]
Gage #8, USGS #02338660, Chattahoochee Basin,
NEW RIVER AT GA 100, NEAR CORINTH

Monthly Average Flow (cfs)

- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum
- Yr2007
- Yr2011
- Yr2018

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

Monthly Average Flow (cfs)

- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum
- Yr2007
- Yr2011
- Yr2018

Back to Map
Gage #17. USGS #02215100, Ocmulgee Basin, TUCSAWHATCHEE CREEK near HAWKINSVILLE, GA

Monthly Average Flow (cfs)

- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum
- Yr2007
- Yr2011
- Yr2018

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

- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum
- Yr2007
- Yr2011
- Yr2018

Monthly Average Flow (cfs)
Gage #27. USGS #02202500, Ogeechee Basin, Ogeechee River near Eden, GA

Monthly Average Flow (cfs)

- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum

Yr2007
Yr2011
Yr2018

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

Monthly Average Flow (cfs)

Driest 50%
Driest 20%
Driest 10%
Driest 5%
Minimum
Yr2007
Yr2011
Yr2018

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

Monthly Average Flow (cfs)
Gage #33. USGS #02227500, Satilla Basin, LITTLE SATILLA RIVER near OFFERMAN, GA

Monthly Average Flow (cfs)

- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum

Yr 2007
Yr 2011
Yr 2018
Gage #34. USGS #02231000, St Mary Basin, ST. MARYS RIVER near MACCLENNY, FL

- Monthly Average Flow (cfs)
- Driest 50%
- Driest 20%
- Driest 10%
- Driest 5%
- Minimum
- Yr2007
- Yr2011
- Yr2018

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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
12. 21T001

Oconee Basin
12. 21T001

Tennessee Basin
13. 03PP01

Suwanee Basin
14. 19E009
17. 27E004

Ogeechee Basin
15. 35P094
Groundwater Level Graphs

• For each of the 17 groundwater wells, EPD has prepared a graph that shows monthly average groundwater levels from January, 2018 through December, 2018;

• 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 2018 was 43ft below land surface. The statistical composite of all historical data for this well shows that monthly average groundwater levels in December have historically been lower than December 2018 about 95% of the time; about 5% 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 monthly average groundwater levels in December have historically been lower than December 2011 about 2% of the time; about 98% of the time in December they have been higher.

– 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 monthly average groundwater levels in December have historically been lower than December 2007 about 2% of the time; about 98% of the time in December they have been higher.
Well #1, 16MM03, Crystalline Rocks Aquifer in Chattahoochee Basin,
Monthly Average Depth Below Land Surface

Depth below Land Surface (ft.)
Well #2, 11AA01, Surficial Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface

Depth below Land Surface (ft.)

-24 -22 -20 -18 -16 -14 -12 -10 -8

Yr2007 Yr2011 Yr2018

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Well #3, 13L180, Floridan Aquifer in Flint Basin, Monthly Average Depth Below Land Surface

- Depth below Land Surface (ft.)
- Back to Map
Well #4, 12M017, Floridan Aquifer in Flint Basin, Monthly Average Depth Below Land Surface

Depth below Land Surface (ft.)

- Lowest 5%
- Lowest 10%
- Lowest 20%
- Below Median
- Above Median

Yr2007
Yr2011
Yr2018

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

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Well #5, 08K001, Floridan Aquifer in Flint Basin, Monthly Average Depth Below Land Surface

- Lowest 5%
- Lowest 10%
- Lowest 20%
- Below Median
- Above Median

Yr2007, Yr2011, Yr2018

Depth below Land Surface (ft.)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Well #6, 11K003, Floridan Aquifer in Flint Basin, Monthly Average Depth Below Land Surface

- Lowest 5%
- Lowest 10%
- Lowest 20%
- Below Median
- Above Median

Yr2007
Yr2011
Yr2018

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Well #7, 12K014, Floridan Aquifer in Flint Basin, Monthly Average Depth Below Land Surface

Depth below Land Surface (ft.)

Yr2007
Yr2011
Yr2018

Back to Map
Well #8, 13J004, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface

Depth below Land Surface (ft.)

- Lowest 5%
- Lowest 10%
- Lowest 20%
- Below Median
- Above Median

Yr2007
Yr2011
Yr2018

Back to Map
Well #9, 08G001, Floridan Aquifer in Flint Basin, Monthly Average Depth Below Land Surface

- Lowest 5%
- Lowest 10%
- Lowest 20%
- Below Median
- Above Median

Yr2007
Yr2011
Yr2018

Depth below Land Surface (ft.)

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

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Well #10, 10G313, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface

- Depth below Land Surface (ft.)
- Well #10, 10G313, Floridan Aquifer in Flint Basin,
- Monthly Average Depth Below Land Surface
- Lowest 5%
- Lowest 10%
- Lowest 20%
- Below Median
- Above Median
- Yr2007
- Yr2011
- Yr2018
Well #11, 09F520, Floridan Aquifer in Flint Basin,
Monthly Average Depth Below Land Surface

Lowest 5%
Lowest 10%
Lowest 20%
Below Median
Above Median
Yr2007
Yr2011
Yr2018

Depth below Land Surface (ft.)

-54 ft
-53 ft

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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
Yr2018

Back to Map
Well #13, 03PP01, Valley and Ridge Aquifer in Tennessee Basin, Monthly Average Depth Below Land Surface

- Lowest 5%
- Lowest 10%
- Lowest 20%
- Below Median
- Above Median

Year:
- Yr2007
- Yr2011
- Yr2018

Graph showing the depth below land surface for Well #13 from January to December, with data from Yr2007, Yr2011, and Yr2018.
Well #14, 19E009, Floridan Aquifer in Suwanee Basin,
Monthly Average Depth Below Land Surface
Well #15, 35P094, Surficial Aquifer in Ogeechee Basin, Monthly Average Depth Below Land Surface

Depth below Land Surface (ft.)

-12 -10 -8 -6 -4 -2 0

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

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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
Yr2018

Back to Map
Well #17, 27E004, Floridan Aquifer in Suwanee Basin,
Monthly Average Depth Below Land Surface

Depth below Land Surface (ft.)

-66
-64
-62
-60

Yr2007
Yr2011
Yr2018

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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, 2018 through December, 2018.

• 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 2018 reservoir elevations into perspective, elevations for 2007 and 2011 are also shown.
CARTERS ELEVATION

Elevation (ft)

Top of Conservation Pool
Top of Zone 2
BOC
Y2007
Y2011
Y2018

Zone 1
Zone 2

BOC

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WEST POINT ELEVATION

Elevation (ft)

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 2018
2019 ACF Basin Composite Conservation and Flood Storage

Top of Conservation
Composite Zone 1
Composite Zone 2
Composite Zone 3
Composite Zone 4
Drought Zone

Composite Conservation & Flood Storage, (ac-ft)

1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0

1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug 1-Sep 1-Oct 1-Nov 1-Dec

Actual data thru 1-22-2019

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

Compiled by USACOE.
Climate Prediction Center
3-month Temperature and Precipitation Probability Outlook
and Seasonal Drought Outlook

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

THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID FEB 2019
MADE 17 JAN 2019

Probabilities for below-normal, near-normal, and above-normal temperatures are based on the Climate Prediction Center’s 3-Month Temperature Outlook. The outlook is a forecast of average temperatures for the current month through January of the following year. The outlook is derived using climate models, which are calibrated with historical climate data. The models are updated monthly and the outlook is based on the most recent model runs. The outlook provides a probabilistic assessment of temperature anomalies, which are defined as deviations from the long-term average. The outlook is updated regularly to reflect the latest climate information and models.