National Weather Service
Greenville-Spartanburg

2018 Winter/Spring Flood Outlook #5

Issued March 14, 2018

The fifth and final 2018 Winter/Spring Flood Outlook analyzes a general return to near-normal flood potential across the mountains and Foothills and below-normal flood potential across the Piedmont as observed and forecasted precipitation amounts struggle to reach normal values and water demands increase heading into spring…

About This Product

Approximately every two weeks from January through mid-March, NWS Greenville-Spartanburg (GSP) issues a Flood Outlook for the entire service area (see county-to-region legend at the end of this outlook for a list of counties serviced by NWS GSP). These outlooks forecast the potential for runoff, small stream, and mainstem river flooding through late April, or the end of the winter recharge season. The outlook is prepared based on an assessment of several hydrometeorological factors, including recent and forecasted precipitation and observed soil moisture, groundwater levels, streamflows, reservoir levels, and recent flooding events.

This product and an archive of past Flood Outlooks are also located at:
http://weather.gov/gsp/floodoutlook

For additional hydrological and meteorological information please visit:
http://weather.gov/gsp/hydro

Climatology and Season to Date

The mainstem river flood season typically begins in late December. The quantity, frequency, magnitude, and significance of river flood events often increases through late winter with a peak in early to mid-March. While the mainstem river flood season typically ends by late April for the region, small-stream flash flooding can occur year-round.

This season, the mainstem flood season began prematurely in October across the western North Carolina mountains; however, a dry fall and early winter resulted in the development of drought conditions across the Piedmont. Outside of the Blue Ridge Escarpment, January 2018 was a dry month for the remainder of the region, especially across the western Piedmont, where precipitation totals were generally 50-75% of normal. This exacerbated below-normal hydrologic parameters, especially with respect to soil moisture and streamflows and combined with weak long-range signals for precipitation, suggested below-normal flood potential across the Piedmont.

However, February 2018 began very wet in response to a more active northern jet stream and the return of the southern jet stream which traditionally brings additional moisture and energy into the region. Several weak to average-strength storm systems through the first ten days of the month produced regionwide precipitation totals equivalent to 150-350% of normal for the month-to-date, with the highest deviations across Upstate South Carolina. The active pattern culminated by February 12th with a more potent system that produced heavy rainfall totaling 2-6 inches across the mountains and Foothills. The primed soils and elevated streamflows due to the earlier systems exacerbated runoff, causing scattered minor flooding of small streams as well as the upper Catawba, Little Tennessee and French Broad mainstems. As a result of all of these systems, lingering drought conditions across nearly all of the area were eliminated.

From mid- to late February, the upper-level pattern transitioned from an unsettled but flat (i.e., low-energy) progressive flow to a highly anomalous and persistent subtropical ridge which, due to its predominately subsident airmass, resulted in record warmth across the Southeast and kept heavy rainfall west of the region. This record warmth jump-started spring green-up, prematurely increasing evapotranspiration rates and subsequent soil moisture and water storage demands approximately 1-3 weeks ahead of schedule. However, the ridge kept the western Piedmont much drier than normal to end the month, countering the abnormally wet first half of February, and leaving the region near normal to slightly below normal for the month. In closer proximity to the deeper moisture on the wester periphery of the upper ridge, the mountains received near normal rainfall to end February and for the month received 110-200% of normal precipitation.

However, the ridge broke down to end February and an unsettled pattern returned to the Southeast for the first half of March. A series of deep upper-level low pressure systems moved across the eastern US, each one ushering in cooler continental airmasses which resulted in a

gradual progression from slightly above-normal to near-normal to below-normal temperatures for the region. The progressive nature of each system limited Gulf of Mexico moisture flux into the region and overall liquid precipitation totals with each system stayed under an inch, keeping upper soils moist, but eliminating any flood threat. Unlike the second half of February, upper-level low orientation and resultant energy within the mean flow allowed the NC and northern SC Piedmont to benefit the most from each system while the Foothills and Blue Ridge Escarpment received less significant amounts. Consequently, through mid-March, month-to-date precipitation amounts were generally 50-90% of normal across the mountains, Foothills, GA Piedmont, and western SC Piedmont whereas the NC and northern SC Piedmont received much-needed precipitation surpluses ranging from 110-150% of normal.

Observed Precipitation and Flooding

Estimated Precipitation and Observed Flooding

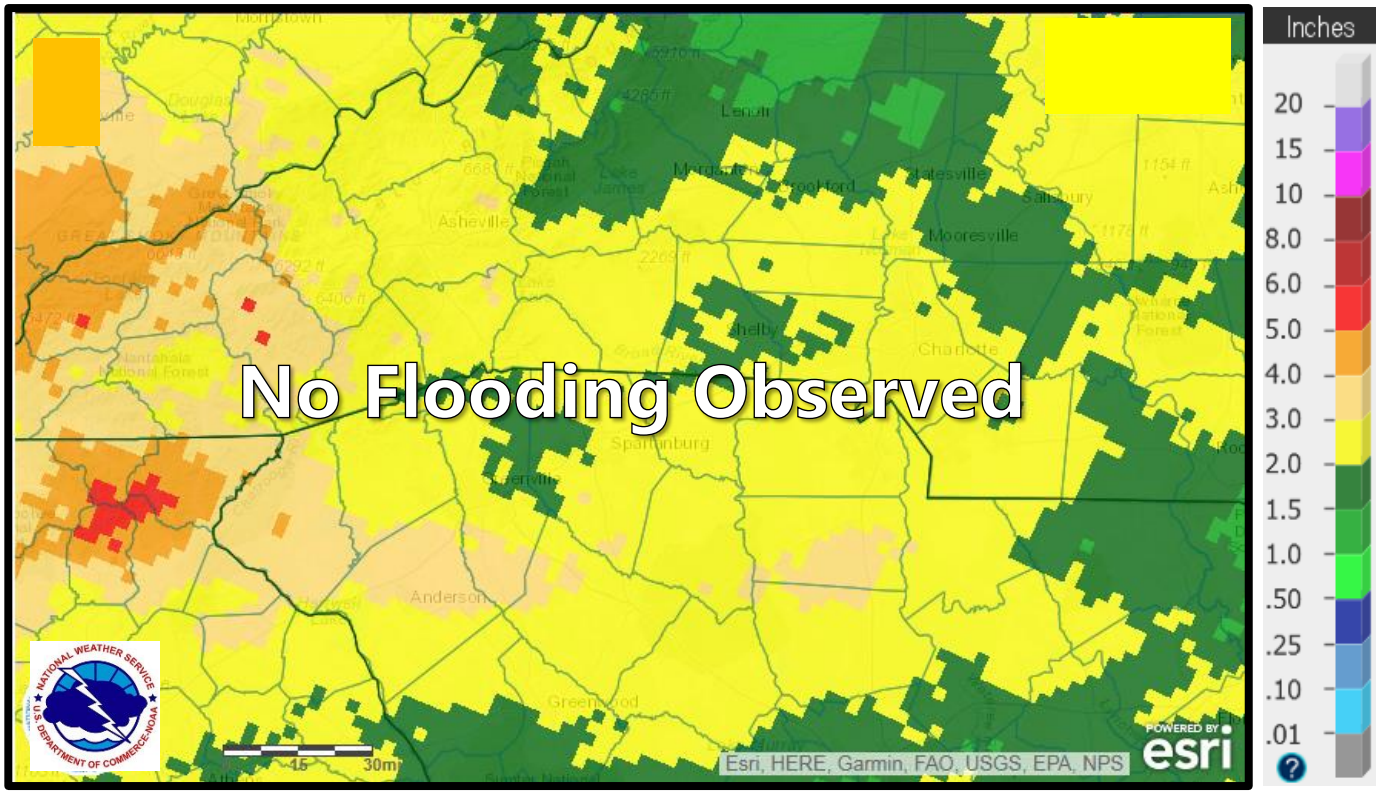

Figure 1. Radar-estimated precipitation for the period from February 26th at 7am through March 13th at 7am within and immediately surrounding NWS Greenville-Spartanburg's service area. No small stream or mainstem flooding was observed during this period.

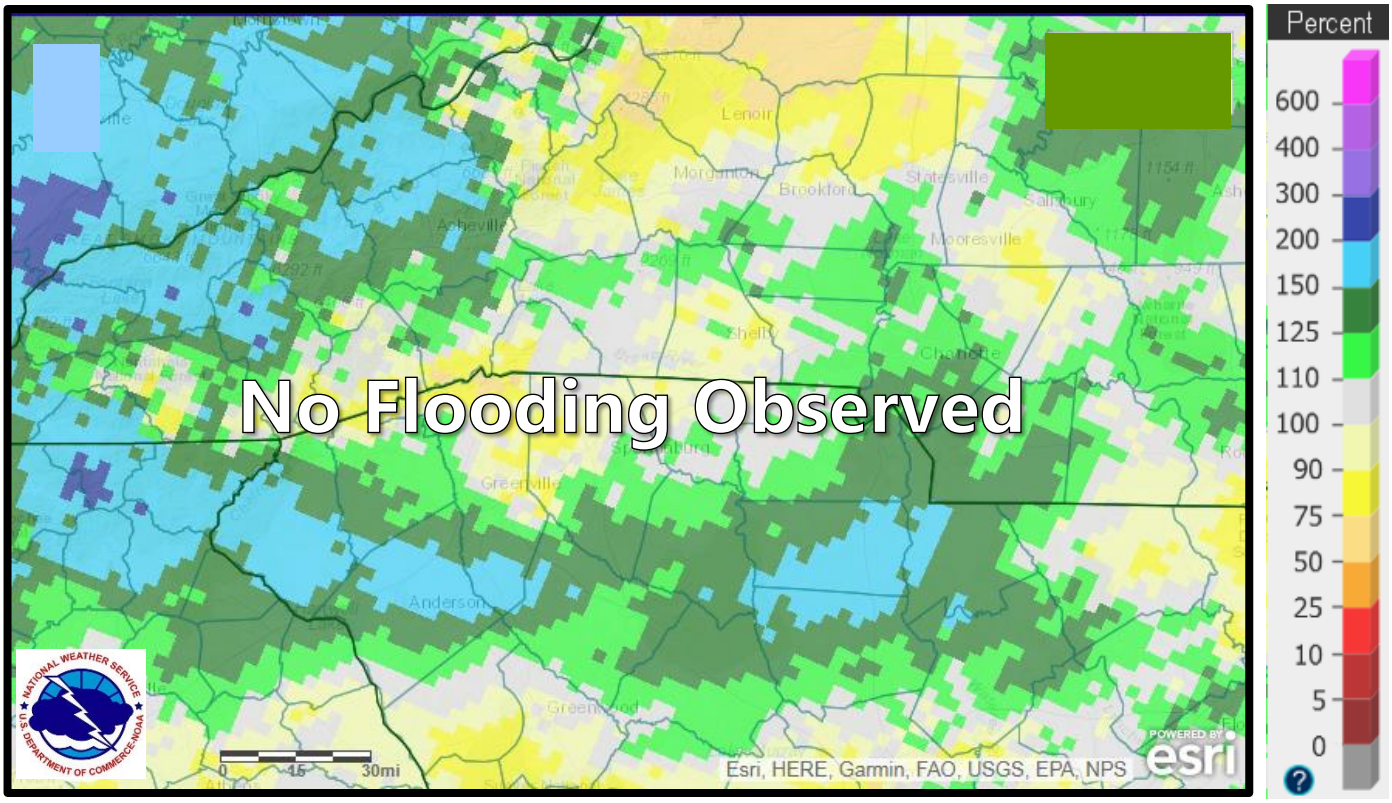

Figure 2. Radar-estimated percent-of-normal precipitation for the period from February 26th at 7am through March 13th at 7am within and immediately surrounding NWS Greenville-Spartanburg's service area. No small stream or mainstem flooding was observed during this period.

Measured Precipitation

Greenville-Spartanburg Service Area
Select Precipitation Totals for February 2018

*For the Period from January 31, 2018 at 7am to February 28, 2018 at 7am**

City	County	State	Monthly Precip For Feb 2018	Monthly Normal For Feb 2018	Departure For Feb 2018	Monthly PoN For Feb 2018	YTD Precip Thru Feb 28, 2018	YTD Normal Thru Feb 28, 2018	YTD Departure Thru Feb 28, 2018	YTD PoN Thru Feb 28, 2018	Driest Rank For Feb 2018	Wettest Rank For Feb 2018	Records Began
Elberton	Elbert	GA	4.37	4.46	-0.09	98%	9.44	8.78	0.66	108%	>25th	>25th	1891
Carnesville	Franklin	GA	4.81	4.87	-0.06	99%	9.01	9.23	-0.22	98%	>25th	>25th	1948
Hartwell	Hart	GA	4.01	4.81	-0.80	83%	8.52	9.11	-0.59	94%	>25th	>25th	1908
Clayton	Rabun	GA	10.07	5.84	4.23	172%	16.87	12.14	4.73	139%	>25th	11th	1893
Toccoa	Stephens	GA	7.14	5.18	1.96	138%	11.59	10.55	1.04	110%	>25th	24th	1892
Taylorsville	Alexander	NC	4.52	4.27	0.25	106%	7.56	8.93	-1.37	85%	20th	5th	1994
Beech Mtn	Avery	NC	5.15	3.80	1.35	136%	9.36	7.66	1.70	122%	23rd	5th	1991
AVL Airport	Buncombe	NC	5.57	3.76	1.81	148%	9.61	7.43	2.18	129%	>25th	10th	1946
Concord	Cabarrus	NC	2.85	3.39	-0.54	84%	6.45	7.01	-0.56	92%	>25th	>25th	1891
Lenoir	Caldwell	NC	4.94	3.67	1.27	135%	8.26	7.20	1.06	115%	>25th	>25th	1871
Hickory	Catawba	NC	4.34	3.72	0.62	117%	7.60	7.55	0.05	101%	>25th	23rd	1949
Shelby	Cleveland	NC	4.45	3.68	0.77	121%	6.80	7.72	-0.92	88%	>25th	>25th	1893
Mocksville	Davie	NC	4.35	3.58	0.77	122%	6.84	7.05	-0.21	97%	>25th	>25th	1893
Waynesville	Haywood	NC	5.87	4.48	1.39	131%	8.33	8.79	-0.46	95%	>25th	25th	1894
Cullowhee	Jackson	NC	6.99	4.63	2.36	151%	10.13	9.28	0.85	109%	>25th	9th	1909
Lincolnton**	Lincoln	NC	4.21	3.65	0.56	115%	6.54	7.50	-0.96	87%	>25th	>25th	1952
Franklin	Macon	NC	6.56	4.74	1.82	138%	9.04	9.84	-0.80	92%	>25th	19th	1872
Marshall	Madison	NC	2.28	3.20	-0.92	71%	3.88	6.25	-2.37	62%	>25th	>25th	1898
Marion	McDowell	NC	5.46	4.16	1.30	131%	11.80	8.22	3.58	144%	>25th	>25th	1893
CLT Airport	Mecklenburg	NC	3.04	3.32	-0.28	92%	5.60	6.73	-1.13	83%	>25th	>25th	1939
Tryon	Polk	NC	7.30	4.86	2.44	150%	12.66	9.96	2.70	127%	>25th	18th	1917
Salisbury**	Rowan	NC	3.68	3.52	0.16	105%	6.58	6.69	-0.11	98%	>25th	>25th	1893
Cherokee	Swain	NC	7.89	4.69	3.20	168%	10.68	9.56	1.12	112%	>25th	4th	1958
Monroe	Union	NC	2.39	3.82	-1.43	63%	6.86	7.81	-0.95	88%	>25th	>25th	1896
Antreville	Abbeville	SC	4.35	4.22	0.13	103%	8.16	8.55	-0.39	95%	>25th	>25th	1952
Anderson	Anderson	SC	5.08	3.90	1.18	130%	8.16	7.75	0.41	105%	>25th	19th	1948
99 Islands	Cherokee	SC	3.32	3.84	-0.52	86%	5.72	7.63	-1.91	75%	>25th	>25th	1940
Chester	Chester	SC	2.88	3.78	-0.90	76%	6.89	7.91	-1.02	87%	>25th	>25th	1922
Cleveland	Greenville	SC	7.34	4.67	2.67	157%	11.64	9.67	1.97	120%	>25th	9th	1943
GRD Airport	Greenwood	SC	3.85	4.13	-0.28	93%	7.81	8.09	-0.28	97%	15th	4th	2000
Laurens	Laurens	SC	3.88	4.20	-0.32	92%	8.50	8.26	0.24	103%	>25th	>25th	1901
Walhalla	Oconee	SC	7.04	4.90	2.14	144%	11.87	9.87	2.00	120%	>25th	24th	1896
Chesnee	Spartanburg	SC	5.69	3.96	1.73	144%	8.51	7.93	0.58	107%	>25th	22nd	1928
GSP Airport	Spartanburg	SC	5.41	3.97	1.44	136%	8.27	7.79	0.48	106%	>25th	11th	1962
Union	Union	SC	3.25	4.14	-0.89	79%	6.16	8.48	-2.32	73%	>25th	>25th	1949
Rock Hill	York	SC	2.61	3.70	-1.09	71%	5.36	7.29	-1.93	74%	9th	12th	1999

Table 1. Select precipitation totals (measurements) for February 2018 from the Western Carolinas and Northeast Georgia within NWS Greenville-Spartanburg's service area. For more details, refer to the table legend on the next page.

Select Precipitation Totals Legend

Drought classification assigned to each observing station is taken from the **February 27, 2018** U.S. Drought Monitor product and represents the highest category occupying at least 25% within the associated county. (*http://droughtmonitor.unl.edu/*)

D0	D1	D2	D3	D4
Abnrml Dry	Moderate	Severe	Extreme	Exceptional

All precipitation amounts are in Inches

*Bolded cites represent official climate stations, which report from midnight on January 31st to midnight on February 28th.

**Lincolnton and Salisbury report near 7pm, therefore, each site's accumulation is valid from 7pm on Jan. 31st to 7pm on Feb. 28th.

YTD = Year to Date

PoN = Percent of Normal

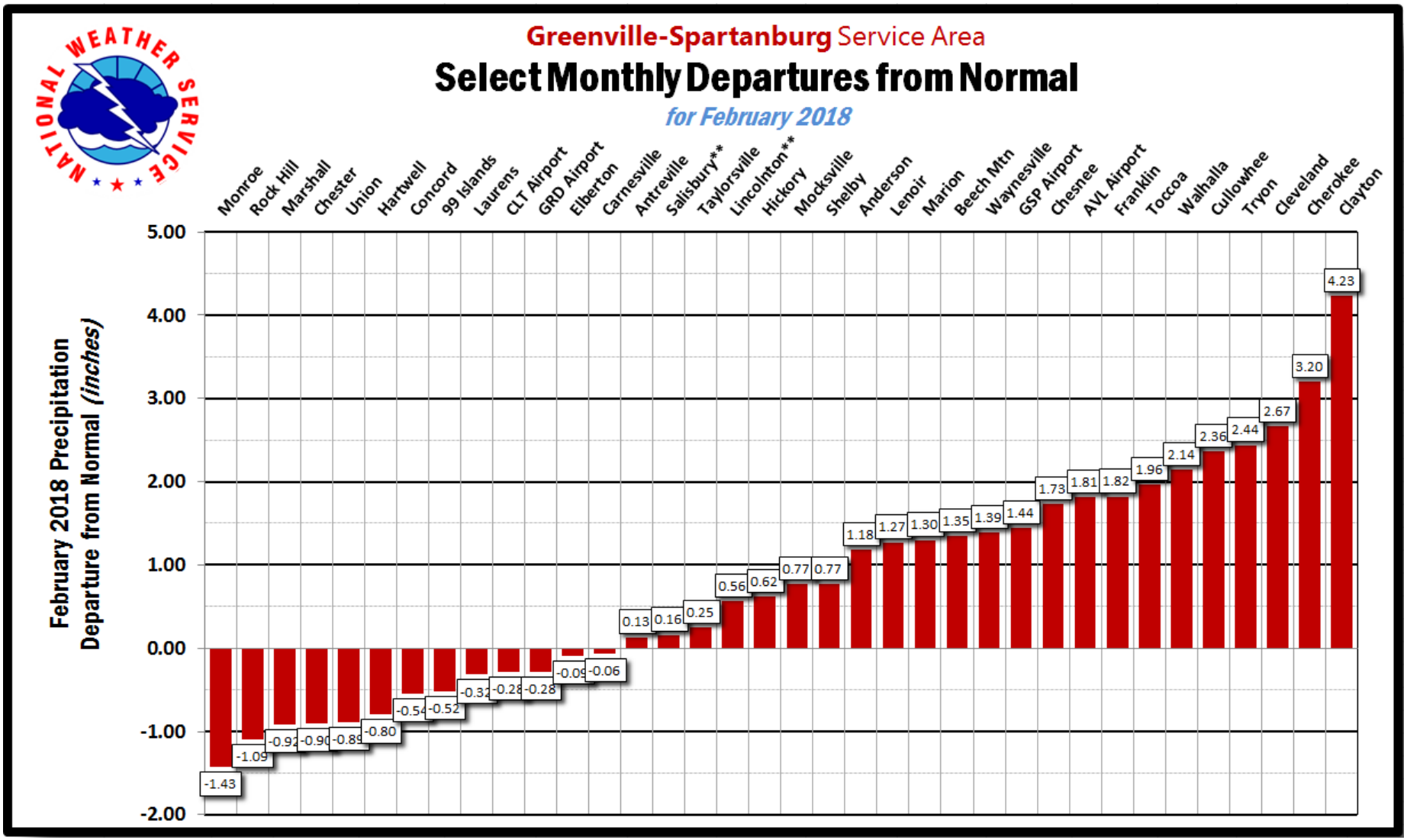

Figure 3. Monthly Departures from Normal for February 2018 from select measurement stations across the Western Carolinas and Northeast Georgia within NWS Greenville-Spartanburg's service area.

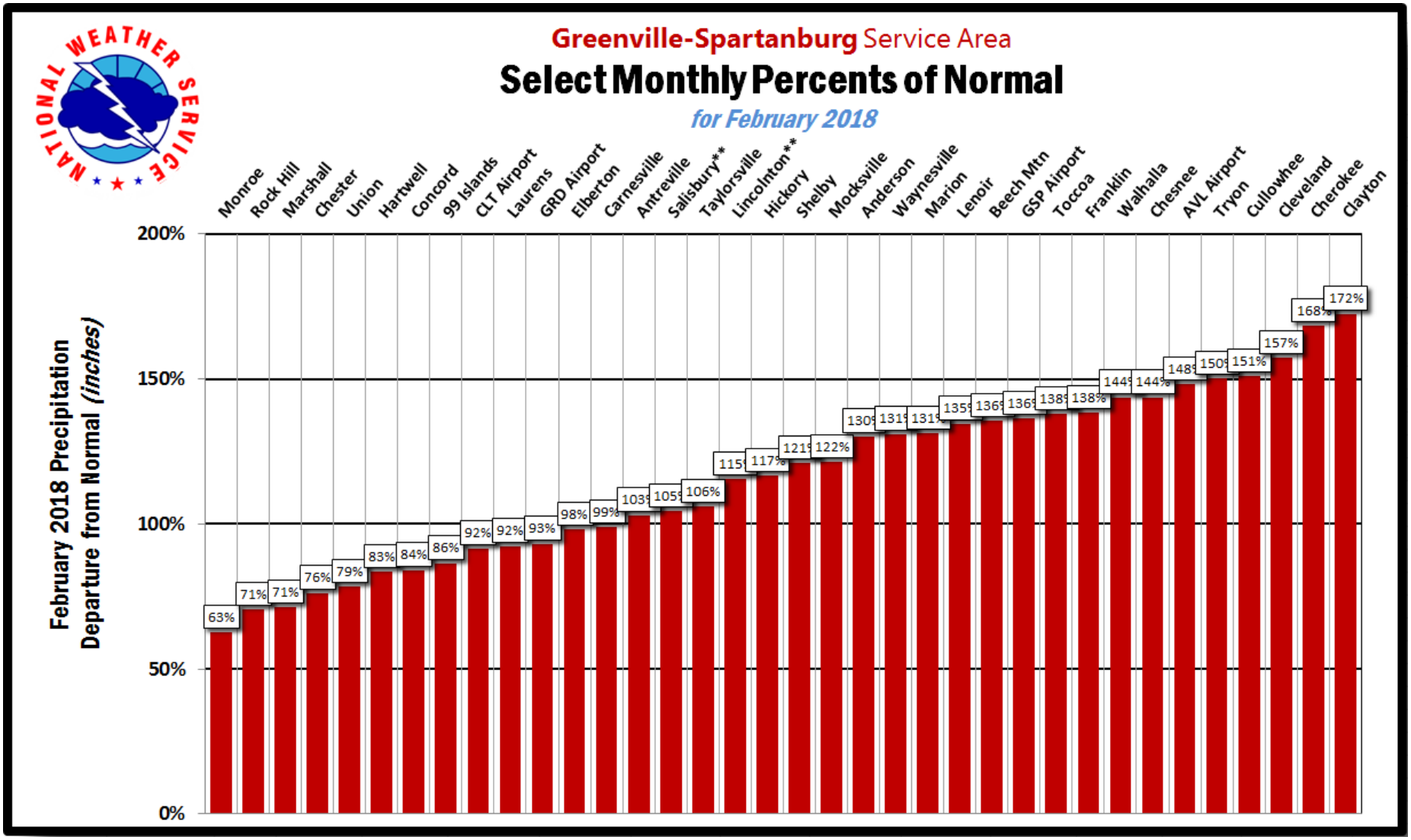

Figure 4. Monthly Percents of Normal for February 2018 from select measurement stations across the Western Carolinas and Northeast Georgia within NWS Greenville-Spartanburg's service area.

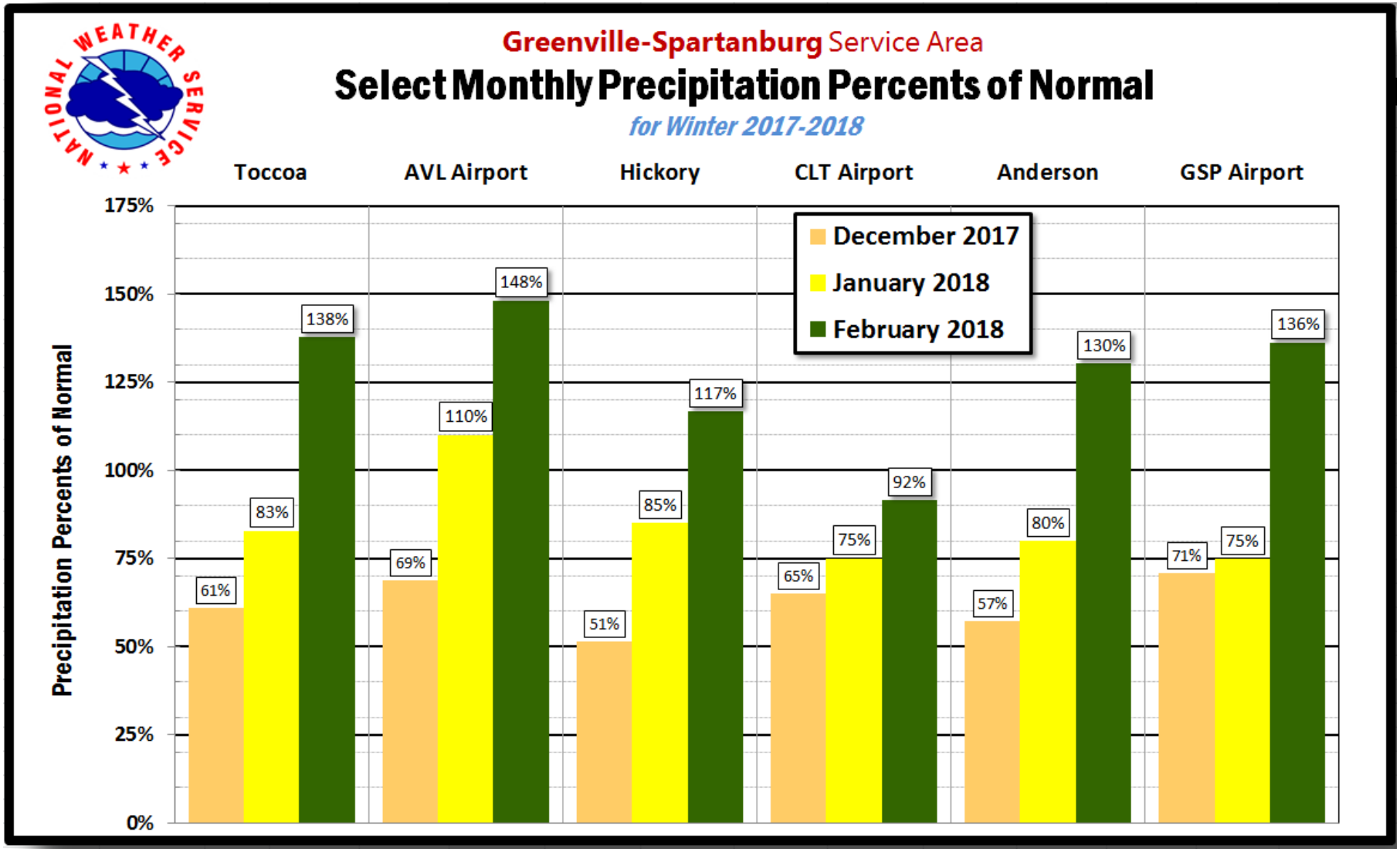

Figure 5. Monthly Percents of Normal for Winter 2017-2018 from select measurement stations across the Western Carolinas and Northeast Georgia within NWS Greenville-Spartanburg's service area.

SNOW DEPTH and FORECAST...

REGION	SNOW DEPTH (in)	SNOW WATER EQUIVALENT (in)	7-DAY SNOWFALL FORECAST 3/14-3/21 (in)
NC Piedmont	0-T	0-T	None
NC Foothills	0-2	0-0.25	0-T
NC Northern Mnts	0-15	0-1	0-1
NC Central Mnts	0-10	0-0.75	0-1
NC Southern Mnts	0-2	0.25	None
SC Mountains	None	None	None
SC Foothills	None	None	None
SC Piedmont	None	None	None
GA NE Mountains/ Foothills	None	None	None
GA Piedmont	None	None	None

DEFINITIONS:

T: Trace

Future Precipitation

Heading into the second half of March, temperatures will quickly return to near-normal and perhaps several degrees above normal as the deep and cold upper-level mean trough departs the eastern US and an unsettled, but fast and fairly flat (i.e., low energy) patterns returns through at least the 19th. Thereafter, one more significant longwave trough passes over the eastern US and should drop temperatures back to below normal, if only briefly before warmer temperatures reminiscent of April return in time to end the month. This pattern is, on average, not conducive to significant precipitation events with limited southern jet stream interaction and Gulf moisture return. Individual convective elements may result in brief heavy rainfall rates in isolated locales, but these rates will not persist long enough or over a large enough area to heighten the flood potential. Therefore, the flood threat through most of March remains low and precipitation may end up being below normal across much of the area at least through the 22-25th. This precipitation outlook combined with generally drier antecedent conditions through mid-March suggests the above-normal flood threat has largely waned and a return to near-normal flood potential across the Foothills and mountains and slightly below-normal flood potential across portions of the Piedmont is more reasonable heading into April.

Furthermore, remember that as temperatures increase due to a normal transition to spring and the vegetation responds in kind, heavier more frequent rainfall will be required to induce runoff rates equivalent to those observed during the colder winter months. Therefore, April's flood occurrence will be dependent on more significant rainfall events, otherwise, the spring flood potential will wane and the threat transitions to a convectively-driven flash flood threat for the late spring and summer months.

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1-10 DAY FUTURE PRECIPITATION FORECAST and FLOOD POTENTIAL...
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REGION              10-DAY      % OF        MAINSTEM      SMALL STREAM
                    PRECIP      NORMAL      FLOOD PTNTL   FLOOD PTNTL
                    3/14-3/24   3/14-3/24   3/14-3/24     3/14-3/24
                    (in)

NC Piedmont         0.25-1.00 |   20- 60 | Zero        | Zero
NC Foothills        0.50-1.25 |   35- 65 | Near Zero   | Near Zero
NC Northern Mnts    0.50-1.50 |   50- 84 | NA          | Near Zero
NC Central Mnts     0.50-1.75 |   40- 75 | Near Zero   | Near Zero
NC Southern Mnts    0.50-1.75 |   35- 70 | Near Zero   | Near Zero

SC Mountains        0.50-1.50 |   35- 70 | NA          | Near Zero
SC Foothills        0.50-1.50 |   30- 75 | Near Zero   | Near Zero
SC Piedmont         0.25-1.25 |   20- 70 | Zero        | Zero

GA NE Mountains/    0.75-1.75 |   40- 75 | Near Zero   | Near Zero
   Foothills
GA Piedmont         0.50-1.25 |   35- 70 | Zero        | Zero
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DEFINITIONS:

Flood Potential Categories:	Zero	= No flood potential
	Near Zero	= Very low flood potential
	Slight	= Isolated Minor Flooding Possible
	Moderate	= Scattered Minor Flooding Likely; Isolated Moderate Flooding Possible
	Likely	= Scattered-Widespread Minor Flooding Likely; Isolated Moderate Flooding Possible
	Significant	= Scattered Moderate/Isolated Major Flooding Likely

8-90 DAY PRECIPITATION OUTLOOKS...

REGION	8-14 DAY PRECIP OUTLOOK (3/22-3/28)	15-28 DAY PRECIP OUTLOOK (3/29-4/11)	APRIL 2018 PRECIP OUTLOOK
NC Piedmont	Slightly Blw Nrml	Slightly Blw Nrml	Slightly Blw Nrml
NC Foothills	Slightly Blw Nrml	Slightly Blw Nrml	Slightly Blw Nrml
NC Northern Mnts	Slightly Blw Nrml	Near Normal	Slightly Blw Nrml
NC Central Mnts	Slightly Blw Nrml	Near Normal	Slightly Blw Nrml
NC Southern Mnts	Slightly Blw Nrml	Near Normal	Slightly Blw Nrml
SC Mountains	Slightly Blw Nrml	Near Normal	Slightly Blw Nrml
SC Foothills	Slightly Blw Nrml	Slightly Blw Nrml	Slightly Blw Nrml
SC Piedmont	Slightly Blw Nrml	Slightly Blw Nrml	Slightly Blw Nrml
GA NE Mnts/ Foothills	Slightly Blw Nrml	Near Normal	Slightly Blw Nrml
GA Piedmont	Slightly Blw Nrml	Slightly Blw Nrml	Slightly Blw Nrml

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HYDROLOGIC SUMMARY...
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..IMPORTANT NOTES...
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It is very important to note that flash flooding and flooding of smaller
tributaries is still very possible during periods of dry weather and/or
drought.  Several important and damaging flash floods were observed during
previous drought periods.  Residents are strongly encouraged to heed related
flood advisories and warnings, even during significant drought.

The winter and early spring months are a critical time for the water system
as widespread winter precipitation normally restores streamflows and
reservoir levels following the spotty, convective nature of precipitation
during the summer and the drier weeks of early fall.  This recharge of the
water system is critical for adequate water supply heading into the late
spring and summer of 2018.  When the winter begins in a significant drought,
it takes a greater amount of precipitation to adequately complete this
recharge.

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..SOIL and CROP MOISTURE...
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---------------------- SOIL/CROP MOISTURE ESTIMATES ------------------------
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                  3/13           3/13     2/18      3/10
                  TOTAL^ COLUMN  SOIL     SOIL      SHORT-TERM
                  SOIL MOISTURE  MOISTURE MOISTURE  CROP MOISTURE
                  ANOMALY        %ile~    %ile~     INDEX*
REGION            (mm)           (%)      (%)

NC Piedmont       - 25 to + 25 | 30-50  | 20-50   | -1 - +1,  Near Normal
NC Foothills         0 to + 50 | 50-70  | 50-90   | +1 - +2,  SAN
NC Northern Mnts  - 25 to + 25 | 30-70  | 50-90   | +1 - +2,  SAN
NC Central Mnts   - 25 to + 25 | 50-80  | 50-80   | +1 - +2,  SAN
NC Southern Mnts     0 to + 50 | 50-80  | 70-90   | +1 - +2,  SAN

SC Mountains/        0 to + 25 | 50-70  | 50-90   | +1 - +2,  SAN
   Foothills
SC Piedmont          0 to - 50 | 20-50  | 20-50   | +1 - +2,  SAN

GA NE Mountains/     0 to + 25 | 50-80  | 50-80   | +1 - +2,  SAN
   Foothills
GA Piedmont       - 25 to + 25 | 30-70  | 30-70   | +1 - +2,  SAN

DEFINITIONS:

EVAPOTRANSPIRATION = The loss of moisture from the soil to the atmosphere
                     plus the loss of moisture from the soil to vegetation.
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INTERPRETATION = Note that above-normal temperatures and below-normal precipitation exacerbate the loss of soil moisture through evapotranspiration, while below-normal temperatures and above-normal precipitation mitigates soil-moisture deficits. However, heading into fall and winter, cooler temperatures and less-active or dormant vegetation reduce demands on the water system and while still important, the effects of above-normal temperatures and below-normal precipitation are lessened. Conversely, demands on the water system increase once vegetation emerges from dormancy during the late winter and evapotranspiration rates increase.

*CROP MOISTURE INDEX = Depicts short-term (< 1 month) dryness or wetness impacting agriculture. Negative values indicate dryness, while positive values indicate wetness. The index is not a depicter of medium-range (i.e., 1-6 months) to long-range (i.e., >6 months) wetness or drought.

SBN = Slightly Below Normal
SAN = Slightly Above Normal

^TOTAL COLUMN = Defined as a 2-meter depth (6.56ft) and derived from the North American Land Data Assimilation System (NLDAS) which is a joint modeling effort between the National Centers for Environmental Prediction and the National Aeronautics and Space Administration.

~PERCENTILES = Normal is defined as anywhere within the 30-70th percentiles, with above-normal or wet conditions >70th and below-normal or dry conditions <30th.

..GROUNDWATER*...

---------- GROUNDWATER WELL MEASUREMENTS ----------
---------- Depth Below Ground Surface in Feet ----------

COUNTY	LOCATION	DEPTH* 3/13 (ft)	MAR** MEDIAN (ft)	CHANGE*** SINCE 2/22 (ft)	RECORD LOWEST LEVEL (ft) and DATE
Caldwell	Granite Falls	16.77	19.75	-0.65	26.43, 03/23/17
Catawba	Oxford Resrch St	40.61	39.39	-0.13	42.09, 01/14/13
Gaston	Pasour Mtn	45.19	37.13	-0.47	45.72, 02/16/18
McDowell	Pleasant Gardens	28.17	29.37	+1.27	31.89, 11/29/10
Union (NC)	Mineral Springs	38.01	38.16	-0.63	42.70, 01/10/13
York	York Co Airport	25.81	25.10	-0.64	29.69, 12/13/12

COUNTY	LOCATION	DEPTH* 3/13 (ft)	CHANGE*** SINCE 2/22 (ft)	%ile **** (3/13)	RECORD LOWEST LEVEL (ft) and DATE
Anderson	Williamston	3.17	-0.19	25-50	5.98, 06/25/02
Burke	Glen Alpine	10.51	+0.02	>90	13.84, 09/04/11
Cherokee	Marble	3.72	+1.02	50-75	15.16, 11/28/16
Chester	Leeds Road	89.60	+0.11	25-50	94.52, 01/12/14
Davie	Mocksville	18.02	-0.25	25-50	23.32, 08/24/02
Haywood	near Cruso	4.15	+0.45	50-75	6.96, 09/12/02
Iredell	Langtree	25.66	-0.05	< 1st	33.03, 11/02/17
Oconee	Oconee Statn Rd	28.78	-0.04	50-75	32.08, 12/31/08
Rowan	Barber	6.12	-0.72	75-90	11.15, 09/14/02
Spartanburg	Croft State Park	47.80	+0.09	25-50	51.69, 03/17/13
Transylvania	Blantyre	27.65	-1.28	50-75	42.19, 12/12/08
Transylvania	Pisgah Forest	12.99	+1.09	50-75	17.86, 08/25/08
White	Unicoi State Pk	4.21	+0.10	25-50	6.49, 09/28/98

DEFINITIONS:

* DEPTH = Note that groundwater is measured as depth below the surface, unlike streamflow and reservoir data which is the reverse or height above the surface. Therefore, the higher the depth value, the less the groundwater supply because the groundwater level is further from the surface.

**MEDIAN = Current depth values that are larger than the monthly median can be loosely correlated to drier-than-normal conditions while current depth values that are smaller than the monthly median can be loosely correlated to wetter-than-normal conditions.

***CHANGE = A POSITIVE CHANGE means the groundwater depth has increased or is further from the surface. Therefore, a NEGATIVE CHANGE means the groundwater depth has decreased or is closer to the surface.

In periods of drought, negative changes are ideal. However, positive changes are NORMAL during the late summer and early fall, as rainfall is typically isolated to scattered and less significant, causing losses to surface and subsurface water sources due to increased evapotranspiration, evaporation, and increased consumption, while negative changes are NORMAL during the late fall and winter, as widespread significant precipitation recharges surface and subsurface water sources and environmental demands are lower.

Note, however, that for many groundwater sites, the depth of the well is very deep and there is a lag between significant rainfall and deep infiltration into subsurface water supplies. If the rainfall is not significant or occurring over a sustained period of time, the water may never reach the groundwater wells. Additionally, if the rainfall is significant but occurring quickly and only once during a period of several weeks, a shallower groundwater well may spike and then return to near pre-rainfall levels.

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PERCENTILE = The percentile (%ile) values can be interpreted as follows:

Less than 10th percentile	- Well-Below Normal
10th-25th percentile	- Below Normal
25th-50th percentile	- Slightly Below Normal/Near Normal
50th-75th percentile	- Slightly Above Normal/Near Normal
75th-90th percentile	- Above Normal
Greater than 90th percentile	- Well-Above Normal

The percentile values are computed monthly. Therefore, percentiles referenced in the chart above are for the month of January. Groundwater well statistics change throughout the water year such that the median monthly depth typically reaches a minimum in autumn and a peak in late spring. This can result in a dramatic change in the percentile of an observed depth from one month to the next, even if the observed depth does not change significantly.

..STREAMFLOW*...

---------- 28-DAY AVERAGE USGS STREAMFLOW PERCENTILES BY REGION ----------

REGION	% OF NORMAL (3/13)	%ILE (3/13)	%ILE (2/22)	CLASSIFICATION (3/13)
NC Piedmont	31- 94	4-49	39-86	Slightly-Below Normal
NC Foothills	63-106	26-57	69-87	Normal
NC Northern Mnts	82- 90	42-47	67-83	Normal
NC Central Mnts	103-131	63-81	61-91	Slightly-Above Normal
NC Southern Mnts	102-181	58-91	86-91	Slightly-Above Normal
SC Mountains/ Foothills	53-137	20-85	65-92	Normal
SC Piedmont	31- 96	9-56	52-82	Slightly-Below Normal
GA NE Mountains/ Foothills	111-148	63-87	76-92	Above Normal
GA Piedmont	52- 63	16-31	55-72	Below Normal

--------- 28-DAY AVERAGE USGS STREAMFLOW PERCENTILES BY RIVER SYSTEM --------

RIVER BASIN	% OF NORMAL (3/13)	%ILE (3/13)	%ILE (2/22)	CLASSIFICATION (3/13)
Broad (GA)	52- 63	16-31	55-65	Below Normal
Broad (NC/SC)/Pacolet	48-106	14-57	54-87	Near Normal (Upper/Pacolet) Below Normal (Lower)
Catawba	31-100	4-53	39-86	Near Normal (Upper)/ Below Normal (Lower)
Enoree/Tyger	55- 93	14-44	52-85	Slightly Below Normal
French Broad	103-142	57-85	61-91	Slightly Above Normal
Nantahala/Tuckasegee/ Little Tennessee	102-181	58-92	72-90	Above Normal
Pigeon	117-128	64-74	81-91	Near Normal
Rocky/Yadkin	38- 91	6-48	39-86	Near Normal (Yadkin) Below Normal (Rocky)
Reedy/Saluda	54-131	14-78	57-92	Near Normal
Tallulah/Chattooga	137-148	83-87	81-92	Above Normal
Toxaway/Keowee/ Savannah	38- 86	9-43	64-83	Slightly Below Normal

DEFINITIONS...

*RESERVOIR INFLUENCE = Please note that streamflows along regulated rivers (i.e., rivers with reservoirs) may be influenced positively and/or negatively by the control of releases from those

reservoirs. For a list of mainstem rivers and their regulation influence, please see the bottom of this product.

..RESERVOIRS...

---------- POOL ELEVATIONS and DROUGHT STAGES ----------

RESERVOIR	NWS ID	PEAK ELEV 2/21-3/17 (ft)	AVG* ELEV 3/17 (ft)	TARGET ELEV 3/17 (ft)	3/17 ELEV-TARGET (ft)	3/17 MIN ELEV* (ft)	3/17 MAX ELEV (ft)	3/17 DGT STGE
BROAD SYSTEM								
Summit	(None)	NA	99.6	97.5	+2.10	85.0	100.0	NA
Gaston Shoals	(BLAS1)	100.02	99.40	NA	NA	99.0	NA	NA
Ninety-Nine Isl	(NNIS1)	100.40	99.73	NA	NA	99.0	NA	NA
CATAWBA SYSTEM (As of 3/1, Total Reservoir Storage is 114% of Target)								
James	(BRWN7)	97.25	97.23	95.5	+1.73	92.0	100.0	ND
Rhodhiss	(RHON7)	97.74	97.45	97.0	+0.45	94.0	100.0	ND
Hickory	(OXFN7)	98.42	96.15	97.0	-0.85	94.0	100.0	ND
Lookout Shoals	(LKSN7)	98.35	97.77	97.0	+0.77	94.0	100.0	ND
Norman	(CWAN7)	97.22	96.98	96.0	+0.98	93.0	100.0	ND
Mountain Island	(MOUN7)	98.37	97.73	96.0	+1.73	94.3	100.0	ND
Wylie	(FOMS1)	98.38	98.00	97.0	+1.00	94.0	100.0	ND
Fishing Creek	(FCDS1)	99.15	97.45	98.0	-0.55	95.0	100.0	ND
Great Falls	(GTFS1)	99.83	97.60	97.5	+0.10	95.0	100.0	ND
Cedar Creek	(CDCS1)	98.69	97.60	97.5	+0.10	96.0	100.0	ND
NANTAHALA/LITTLE TENNESSEE/TUCKASEGEE SYSTEM								
Tanasee Creek	(EFKN7)	95.33	91.69	86.6	+5.09	84.5	94.1	ND
Wolf Creek	(WCDN7)	95.19	91.11	86.6	+4.51	84.5	94.1	ND
Bear Creek	(BCDN7)	94.56	92.59	94.1	-1.51	91.5	98.0	ND
Cedar Cliff	(ICCN7)	98.76	98.00	98.0	0.00	96.0	100.0	0
Glenville	(THPN7)	93.96	93.30	92.1	+1.20	89.0	95.0	ND
Nantahala	(NANN7)	94.80	93.85	90.7	+3.15	81.7	95.6	ND
Queens Creek	(QCDN7)	95.74	88.53	87.9	+0.63	85.8	93.8	ND
Fontana	(FONN7)	1671.93	1664.20	1655.0	+9.20	1650.0	1665.0	NA
SAVANNAH SYSTEM (As of 2/28, Total Reservoir Storage is 85% of Target for Jocassee and Keowee (Duke Energy) and 90% for Hartwell and Russell (USACE))								
Jocassee	(JCSS1)	99.80	97.00	NA	NA	86.0	100.0	0
Keowee	(KEOS1)	99.71	98.58	NA	NA	96.0	100.0	0
Hartwell	(HRTG1)	659.02	658.95	659.33	-0.31	625.0	665.0	0
Russell	(RBDS1)	474.61	473.90	475.0	-0.39	470.0	480.0	0

OPERATIONS NOTES:

LAKE HICKORY From Duke Energy:

"From March 21 through April 18, 2018, the water level at Lake Hickory will be maintained at 94.5 ft. to allow workers to safely perform maintenance work at Oxford Hydro Station. Although these elevations are approximately 2.5 feet lower than the seasonal normal target elevation, they are still within the operating range for Lake Hickory."

PROJECTIONS...

LAKE HARTWELL — February 2018 rainfall brought the lake back to within normal elevations. The pool elevation is projected to remain within 0 to -2 feet of guide curve or target elevations through May.

FONTANA LAKE — Projected to remain above guide curve through the mid-March, though the TVA is working to gradually return the lake to guide curve by April.

DEFINITIONS...

*AVG ELEV — Reporting the daily average elevation factors in the fluctuations in pool elevation due to scheduled discharges and/or power generation.

MINIMUM ELEVATION — The minimal elevation is the lowest elevation that the pool can be to minimally satisfy local community and river system needs. Drought release reduction plans may begin above the minimal elevation. For Lake Hartwell and Richard B. Russell Lake, the minimal elevation marks the bottom of conservation storage or the top of the inactive pool. Here, local community and river system needs can no longer be fully met at the Level 1 Drought Trigger Level. Drought release reduction plans begin at or above the minimal elevation, at 656.0 feet at Lake Hartwell and at 470.0 feet for Richard B. Russell Lake.

MAXIMUM ELEVATION — The maximum elevation is the highest elevation that the pool can be to safely satisfy normal operating conditions. For Duke Energy reservoirs, 100.0 ft. is universally defined as full pool. At this level, water will reach the top of the spillway. Therefore, at higher levels, water will either spill over an ungated spillway or must be discharged by opening gates on a gated spillway. Minor flooding concerns increase around the lake above the maximum elevation, however, an exceedance above maximum elevation does not mean flooding is ongoing or likely. More significant reservoir flooding issues typically occur well above the maximum elevation, on the order of one or more feet.

ND — No Drought
NA — Not Applicable

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LONG-TERM FLOOD OUTLOOK...
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Therefore, given current antecedent conditions and short- to long-range
precipitation guidance, the latest long-term flood outlook through the end of
April 2018 is as follows...

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REGION	RUNOFF POTENTIAL	SMALL STREAMS FLOOD POTENTIAL	MAINSTEM RIVERS FLOOD POTENTIAL
NC Piedmont	Near Normal	Near Normal	Slightly Below Nrml
NC Foothills	Slightly Above Nrml	Near Normal	Near Normal
NC Nrn Mnts	Slightly Above Nrml	Near Normal	NO MAINSTEMS
NC Cntl Mnts	Slightly Above Nrml	Slightly Above Nrml	Near Normal
NC Srn Mnts	Slightly Above Nrml	Slightly Above Nrml	Near Normal
SC Mnts	Slightly Above Nrml	Near Normal	NO MAINSTEMS
SC Foothills	Near Normal	Near Normal	Near Normal
SC Piedmont	Near Normal	Slightly Below Nrml	Slightly Below Nrml
GA NE Mnts/ Foothills	Slightly Above Nrml	Slightly Above Nrml	Near Normal
GA Piedmont	Slightly Below Nrml	Slightly Below Nrml	Below Normal

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NEXT ISSUANCE DATE...
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The next Winter/Spring Flood Outlook will be issued in January, 2019.

===============================================================================
ACKNOWLEDGMENTS...
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The precipitation analysis is derived from quality-controlled
gridded precipitation estimates produced at the Lower Mississippi
River Forecast Center (LMRFC) and the Southeast River Forecast
Center (SERFC).

The 1-10 day future precipitation is derived from guidance produced
by NWS Greenville-Spartanburg.

The long-term precipitation outlooks are derived from guidance
produced at the Climate Prediction Center (CPC).

Streamflow information is courtesy of the United States Geological
Survey (USGS).

Reservoir information is courtesy of Duke Energy...Georgia Power...
and the US Army Corps of Engineers (USACE).

The mainstem rivers flood outlook is produced in collaboration with
the LMRFC and the SERFC.

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ADDITIONAL RESOURCES...
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For the latest LEVELS of streams and mainstem rivers across the
region please visit and bookmark:

http://water.weather.gov/ahps2/
area.php?wfo=gsp&hydro_type=0&hsa_type=1

For the latest status of DROUGHT conditions across the region please
visit and bookmark:

http://droughtmonitor.unl.edu

Please note the U.S. Drought Monitor is released every Thursday
morning, but only factors in data through Tuesday morning.  Any
precipitation which may occur after Tuesday morning, but before
Thursday morning, is considered in the following week's product.
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COUNTY TO REGION LEGEND...
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..GEORGIA...
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COUNTY          REGION

Elbert          GA Piedmont
Franklin        GA Piedmont
Habersham       GA NE Mountains/Foothills
Hart            GA Piedmont
Rabun           GA NE Mountains/Foothills
Stephens        GA NE Mountains/Foothills

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..NORTH CAROLINA...
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COUNTY          REGION (SUBREGION)

Alexander       NC Foothills (Northern)
Avery           NC Northern Mountains
Buncombe        NC Central Mountains
Burke           NC Foothills (Northern)
Cabarrus        NC Piedmont (Southern)
Caldwell        NC Foothills (Northern)
Catawba         NC Foothills (Northern)
Cleveland       NC Piedmont (Southern)
Davie           NC Piedmont (Northwest)
Gaston          NC Piedmont (Southern)
Graham          NC Central Mountains
Haywood         NC Central Mountains
Henderson       NC Southern Mountains
Iredell         NC Piedmont (Northwest)
Jackson North   NC Central Mountains
Jackson South   NC Southern Mountains
Lincoln         NC Piedmont (Southern)
Macon           NC Southern Mountains
Madison         NC Central Mountains
McDowell        NC Foothills (Northern)
Mecklenburg     NC Piedmont (Southern)
Mitchell        NC Northern Mountains
Polk            NC Foothills (Southern)
Rowan           NC Piedmont (Northwest)
Rutherford      NC Foothills (Southern)
Swain           NC Central Mountains
Transylvania    NC Southern Mountains
Union           NC Piedmont (Southern)
Yancey          NC Northern Mountains

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..SOUTH CAROLINA...
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COUNTY	REGION (SUBREGION)
Abbeville	SC Piedmont (Lower)
Anderson	SC Piedmont (Northern)
Cherokee	SC Piedmont (Northern)
Chester	SC Piedmont (Eastern)
Greenville	SC Mountains/Foothills
Greenwood	SC Piedmont (Lower)
Laurens	SC Piedmont (Lower)
Oconee	SC Mountains/Foothills
Pickens	SC Mountains/Foothills
Spartanburg	SC Mountains/Foothills
Union	SC Piedmont (Eastern)
York	SC Piedmont (Eastern)

MAINSTEM RIVER LEGEND...

REGION	RIVER	
NC Piedmont	Catawba	(Heavily Regulated)
	South Fork Catawba	(Slightly Regulated)
	Rocky	
	Yadkin	(Regulated)
NC Foothills	Broad	(Regulated)
	Catawba	(Regulated)
NC Nrn Mnts	NONE	
NC Cntl Mnts	French Broad	(Slightly Regulated)
	Little Tennessee	(Heavily Regulated)
	Nantahala	(Heavily Regulated)
	Oconaluftee	(Slightly Regulated)
	Pigeon	
	Tuckasegee	(Heavily Regulated)
NC Srn Mnts	French Broad	(Slightly Regulated)
	Little Tennessee	(Heavily Regulated)
	Nantahala	(Regulated)
	Tuckasegee	(Regulated)
SC Mnts	NO MAINSTEM RIVERS	
SC Foothills	Chatooga	
	Enoree	
	Pacolet	(Slightly Regulated)
	Reedy	(Slightly Regulated)
	Saluda	(Regulated)
	Savannah	(Heavily Regulated)
	Toxaway/Seneca	(Heavily Regulated)
	Tyger	
SC Piedmont	Broad	(Regulated)
	Pacolet	(Slightly Regulated)
	Reedy	(Slightly Regulated)
	Saluda	(Regulated)
	Savannah	(Heavily Regulated)
	Tyger	
GA NE Mnts/ Foothills	Chatooga	
	Tallulah/Tugaloo	(Heavily Regulated)
GA Piedmont	Broad	
	Savannah	(Heavily Regulated)

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QUESTIONS or COMMENTS...
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This product has undergone several revisions and enhancements over
the past couple of years.  Additional enhancements are planned for
future flood outlooks. Your feedback and recommendations
are encouraged in order to ensure this product meets user needs.
Please direct feedback, recommendations, questions, and comments to:

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JMP
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