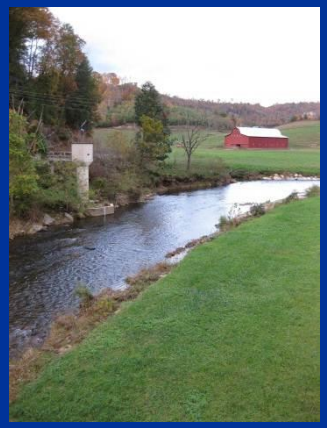
USGS
science for a changing world

Streamflow conditions across North Carolina

Assessment of hydrologic conditions observed through April 2016…



USGS South Atlantic Water Science Center (Raleigh)
http://nc.water.usgs.gov

Online drought pages for USGS in North Carolina
http://nc.water.usgs.gov/drought/

U.S. Department of the Interior
U.S. Geological Survey

Presented to:
North Carolina Drought Management Advisory Council
Gov. James G. Martin Building, NC State Fairgrounds, Raleigh, NC
April 28, 2016

USGS South Atlantic Wate ×

nc.water.usgs.gov

Apps | Weather and News | USGS North Carolin... | USGS Water Data for... | StreamStats in Nort... | Forest Hills Baptist C... | Google Drive

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http://nc.water.usgs.gov/

DATA CENTER

Real-time data
- Streamflow
- Groundwater
- Water quality
- Precipitation

Subscribe to hydrologic alerts
USGS WaterAlert

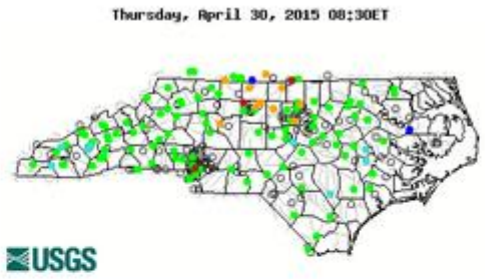
Monthly Conditions Report

WaterWatch
- Current conditions
- Flood Watch
- Drought Watch
- Water Quality Watch

Water Resources of North Carolina

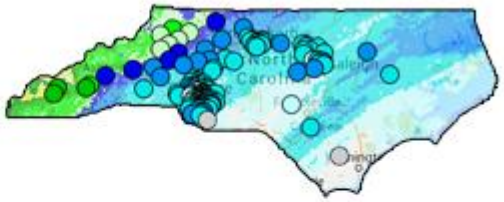
Current Data

Current Streamflow



Current Rainfall

1-, 2-, 3-, 6-, 12-, and 24-hour and 2- and 7-day rainfall data



Real-time Tables

Select a Data Table

Current Drought Conditions
Current Flood Conditions

Specialty Network Maps

Groundwater Networks
Select a Groundwater Network

Water-Quality Networks
Select a Water-Quality Network

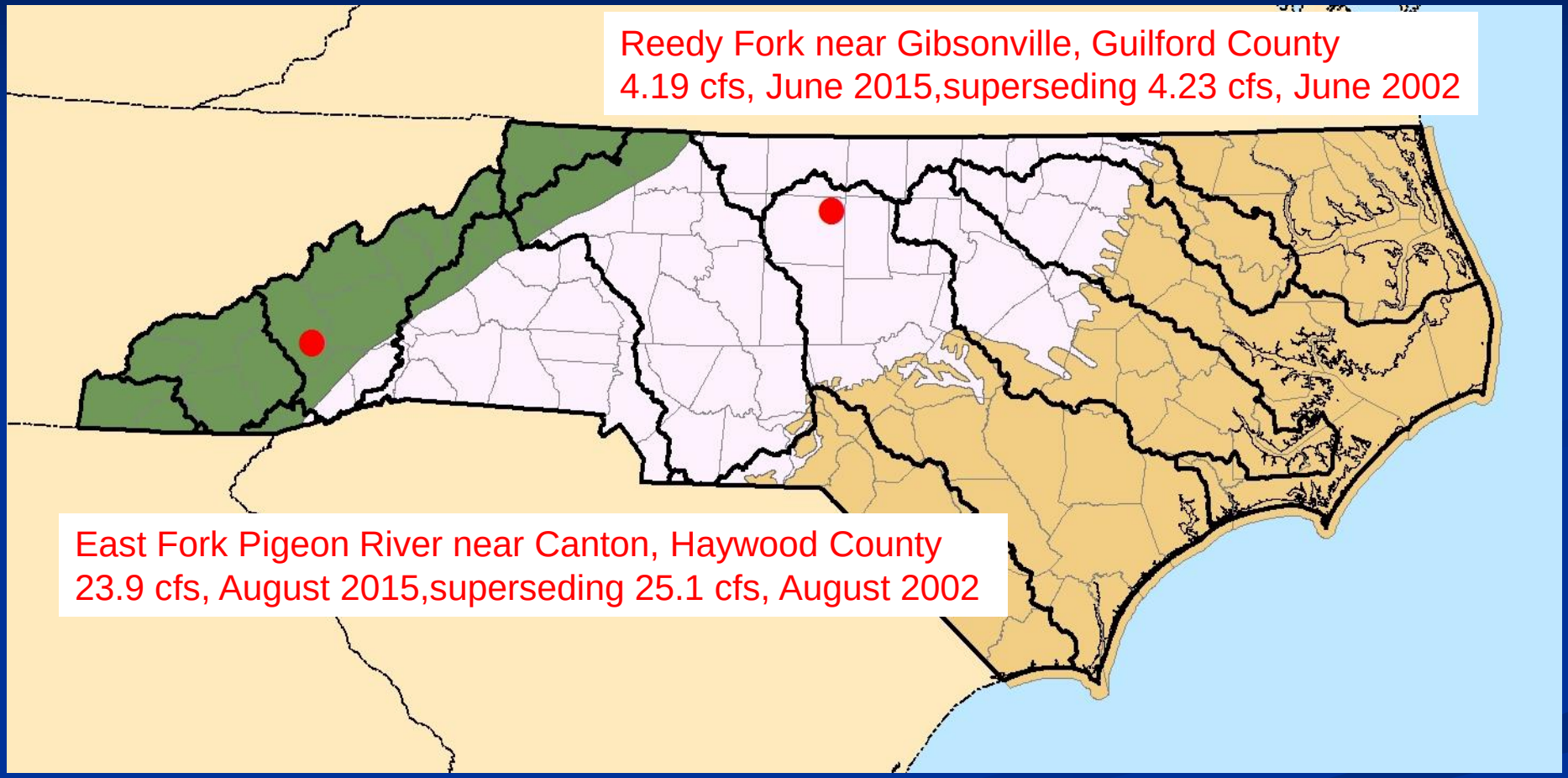
USGS WaterAlert | USGS WaterNow

Water year 2015 continuous records approved and published for:

- Surface water:
  - 218 discharge sites
  - 39 stage-only sites
- Groundwater: 44 wells
- Water quality monitor: 2 sites
- Water temperature: 24 sites
- Precipitation: 137 sites

USGS

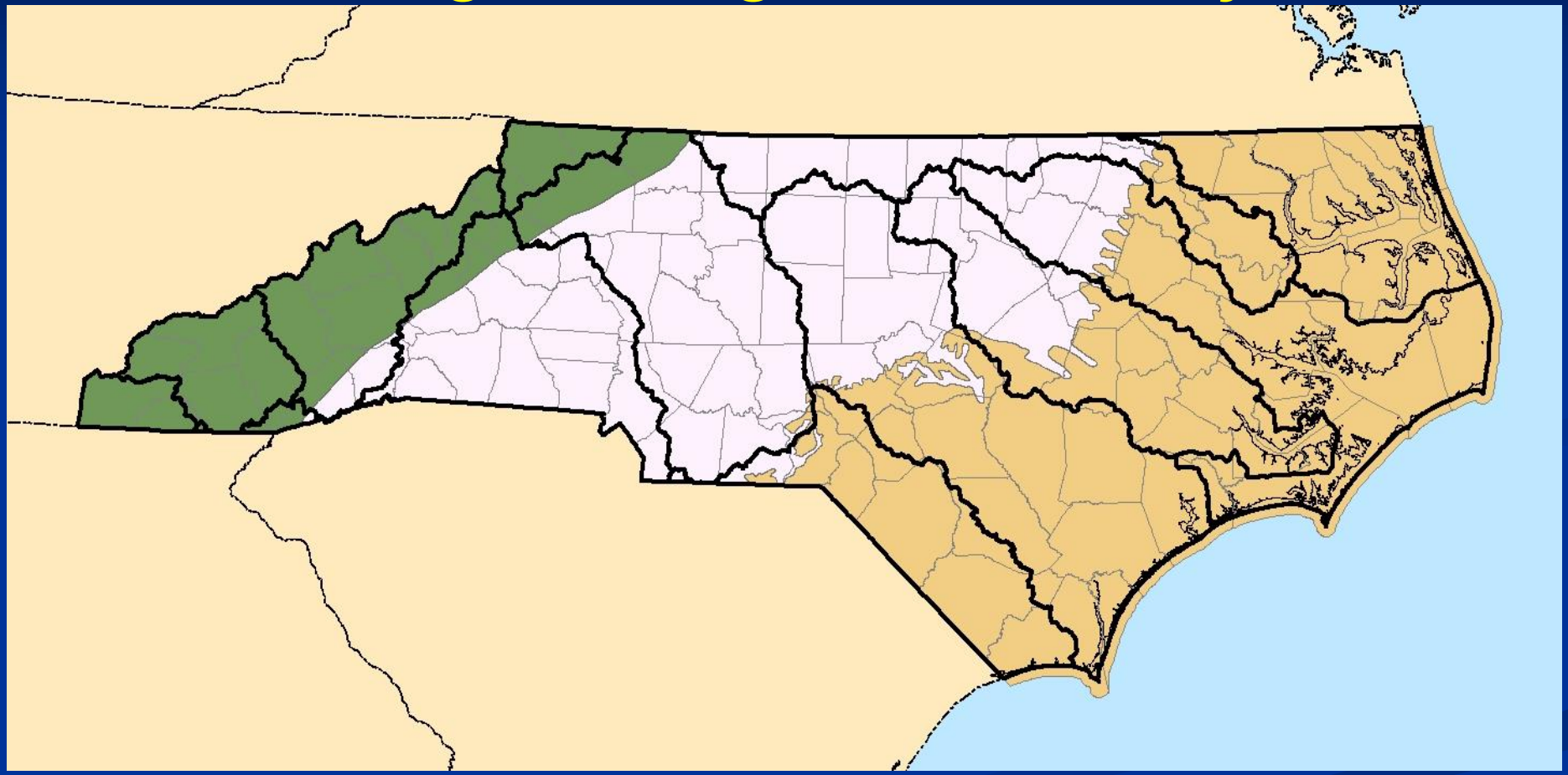
New record monthly minimum average during 2015 water year



USGS

Two sites during the 2015WY…

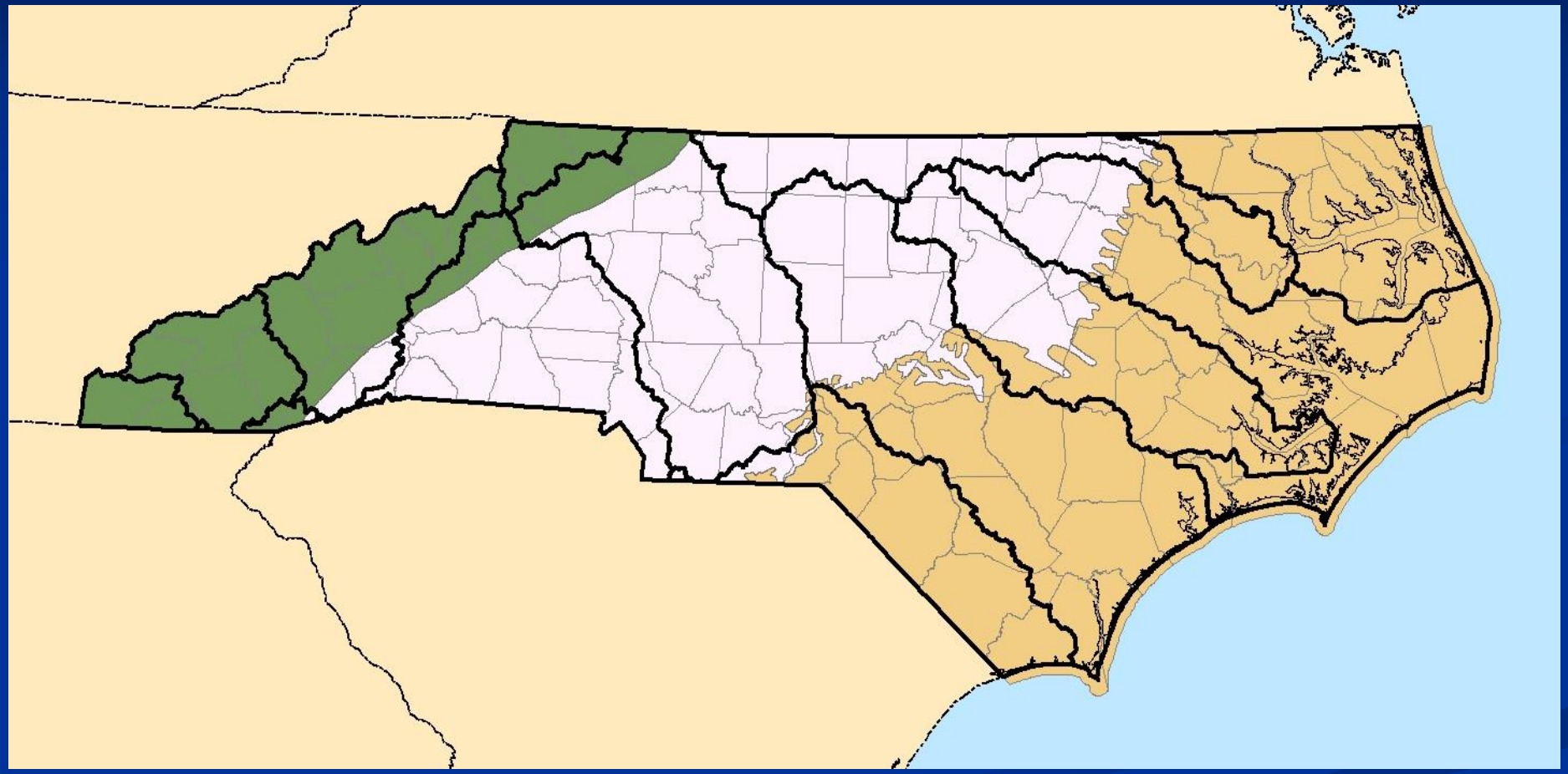
New period of record minimum daily mean discharge during 2015 water year



USGS

No sites during the 2015WY…

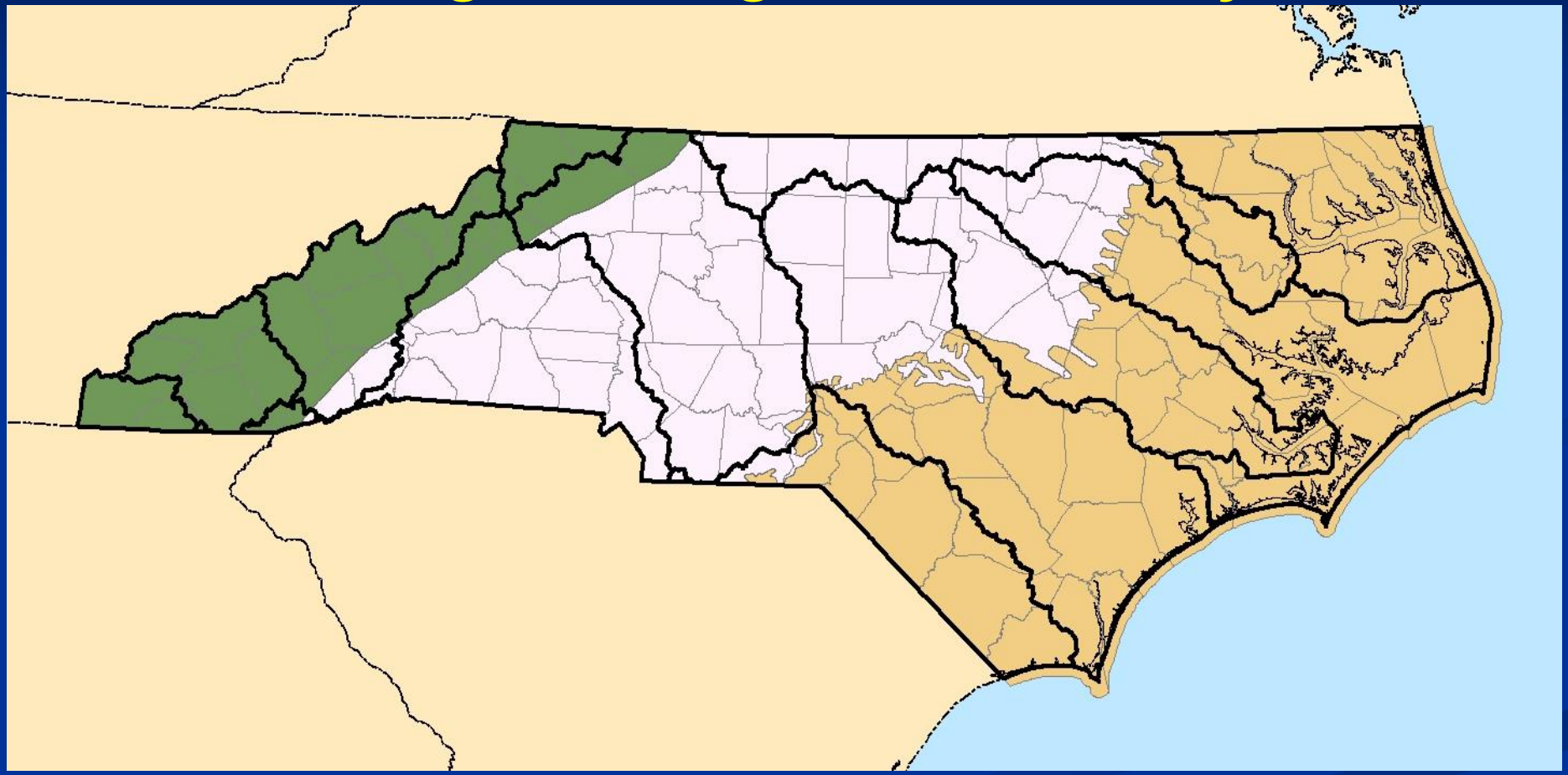
New record monthly minimum average during 2016 water year



USGS

provisional…no sites…as of April 26

New period of record minimum daily mean discharge during 2016 water year



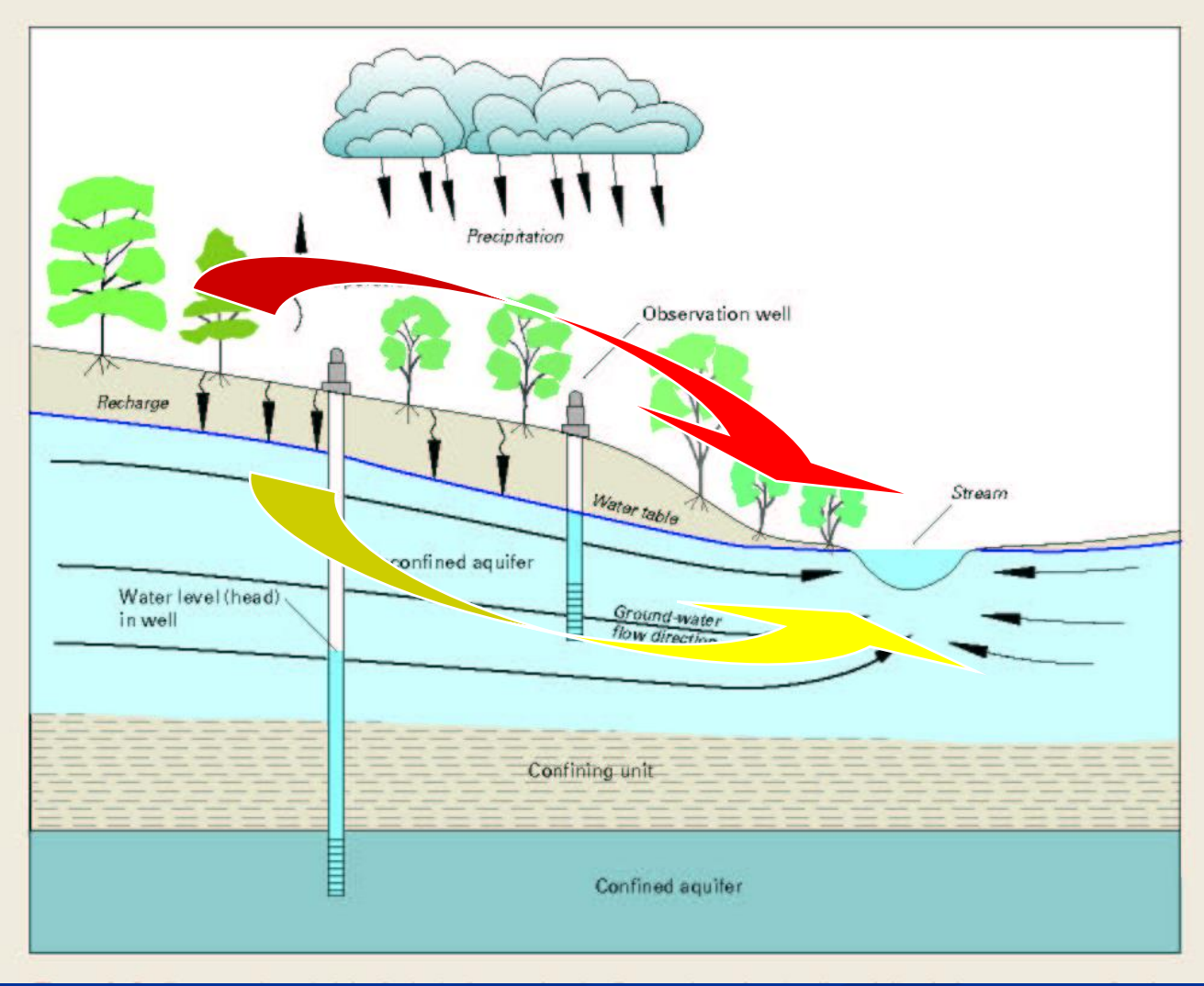
USGS

provisional…no sites…as of April 28

Visualizing the components in streamflow

Overland runoff

Base flow (ground-water discharge to streams)



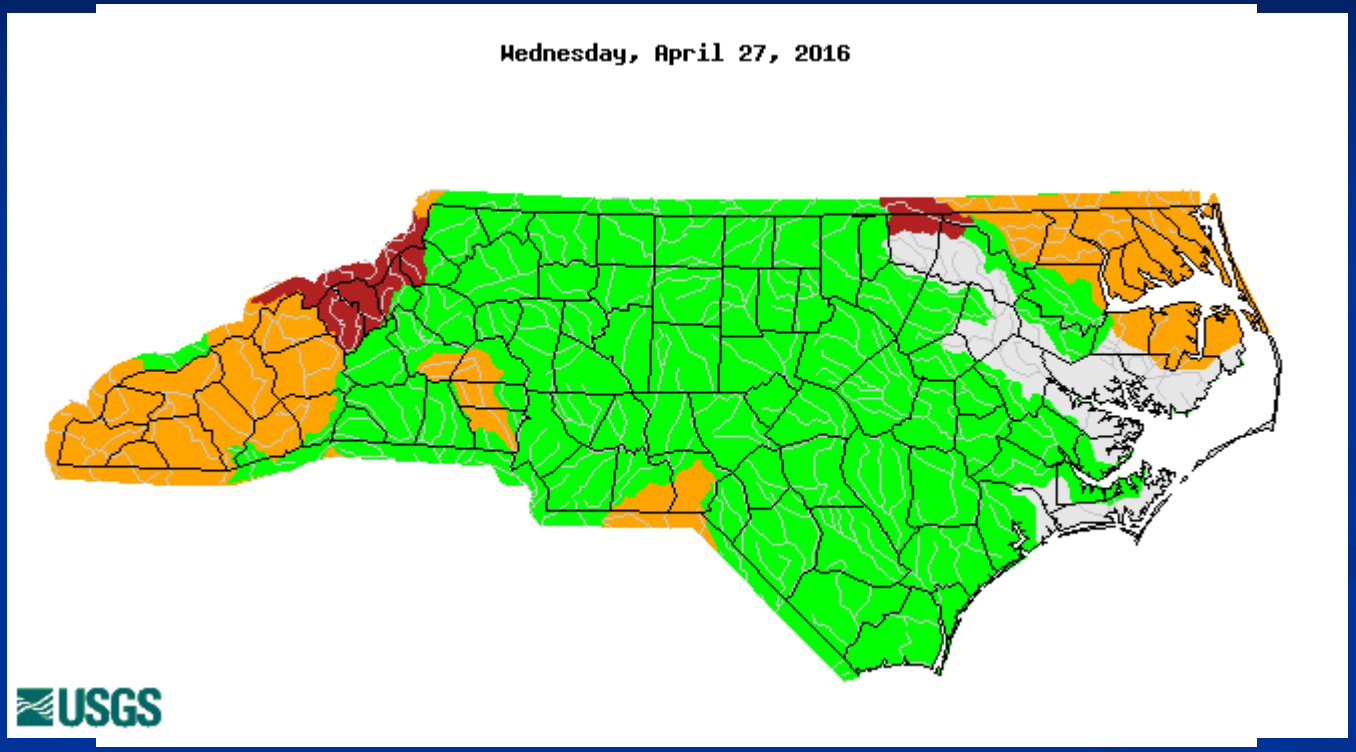
From:
Ground-water-level Monitoring and the Importance of Long-Term Water-Level Data
USGS Circular 1217 by Taylor and Alley, 2002 (Figure A-2, page 4)

A couple "take home" points…up front

- Streamflow conditions across state being in general decline since early March following sustained high-flow conditions since early October
- Percentage of 28-day flows below normal potentially approaching third highest (since Dec 2012 and Sept 2015) in the next few weeks if no rain materializes

USGS

Overall 7-day average flows
as of April 27

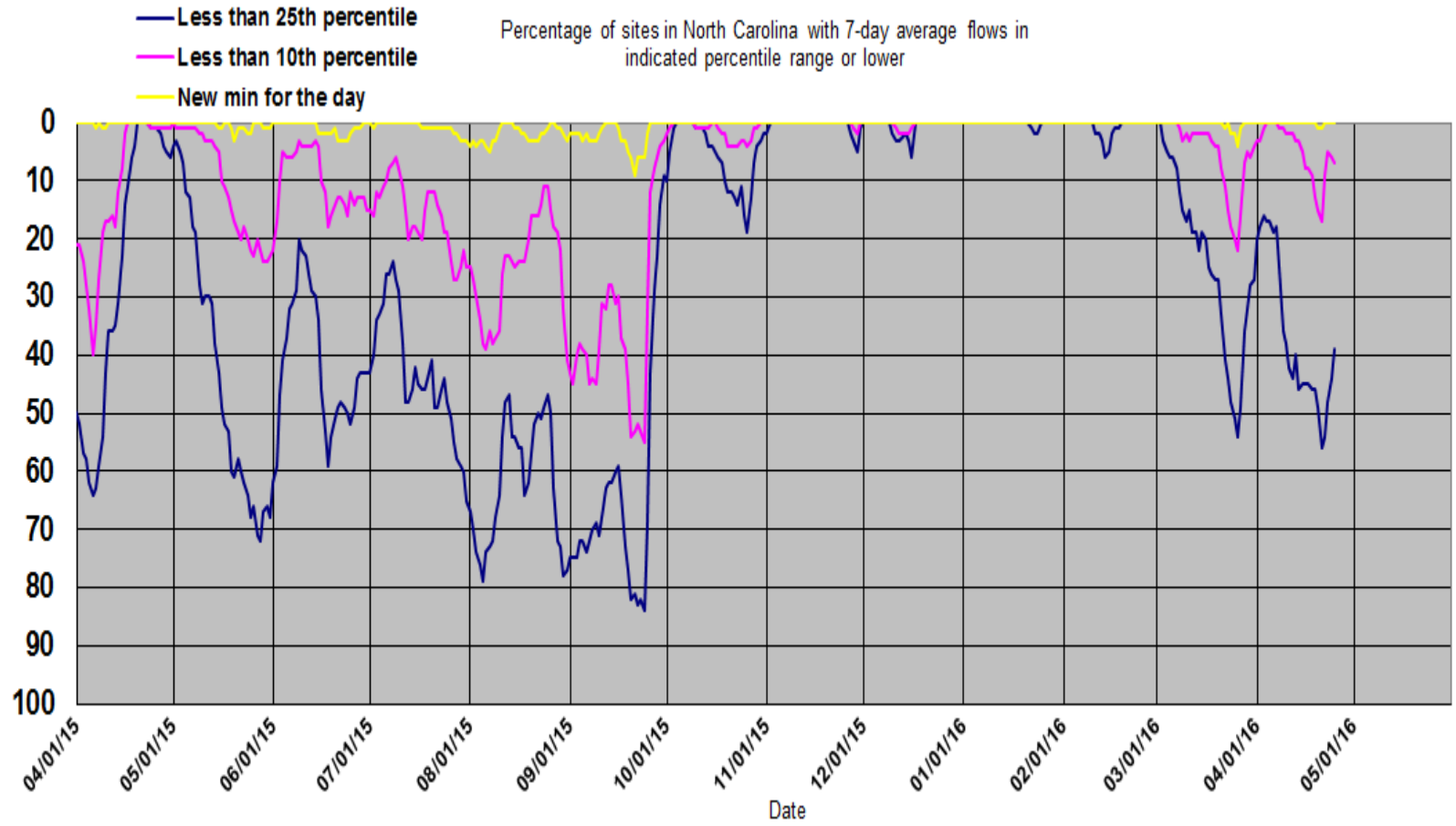


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS

Available at URL http://waterwatch.usgs.gov/index.php

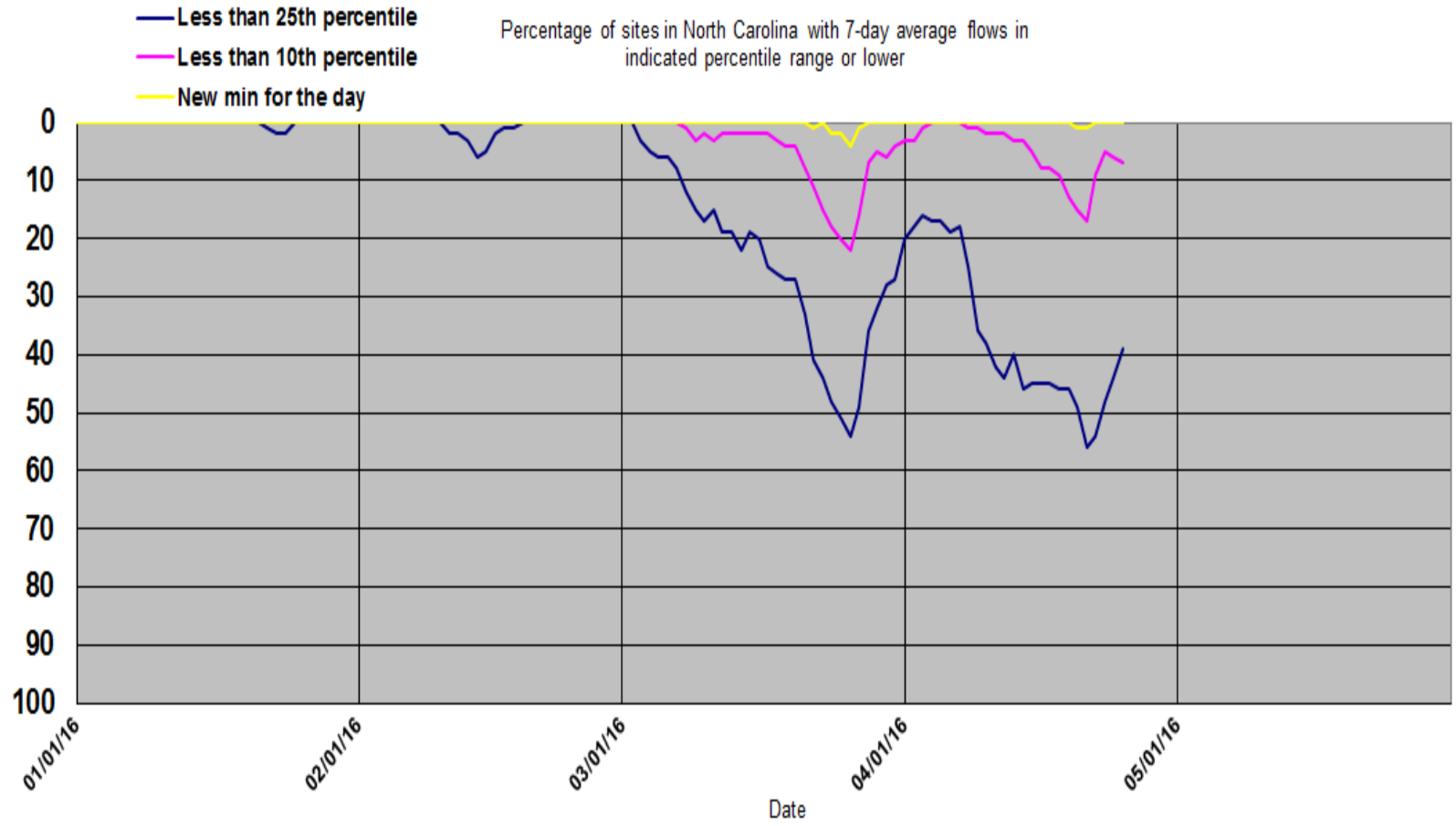
Percentage of sites with 7-day average flows below normal (< 25th percentile)



USGS

Since April 1, 2015

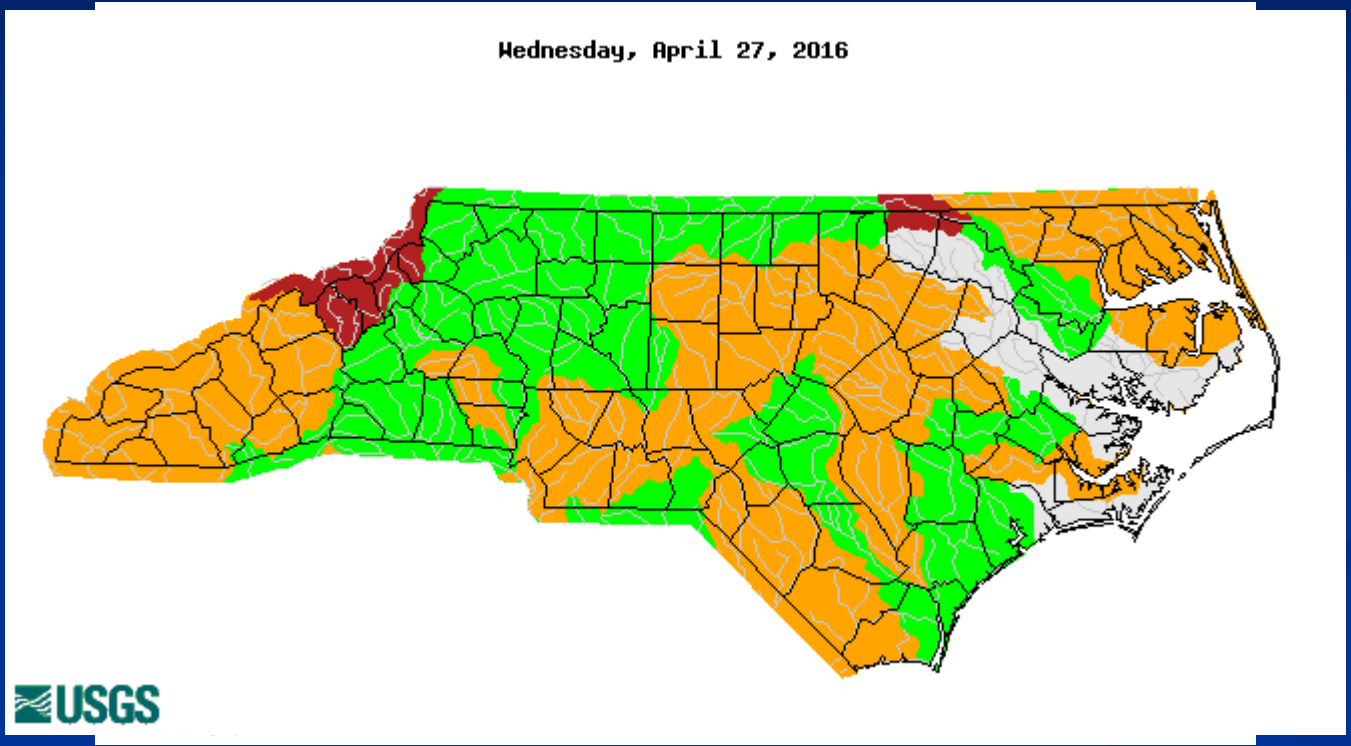
Percentage of sites with 7-day average flows below normal (< 25th percentile)



USGS

Since January 1, 2016

Overall 28-day average flows
as of April 27

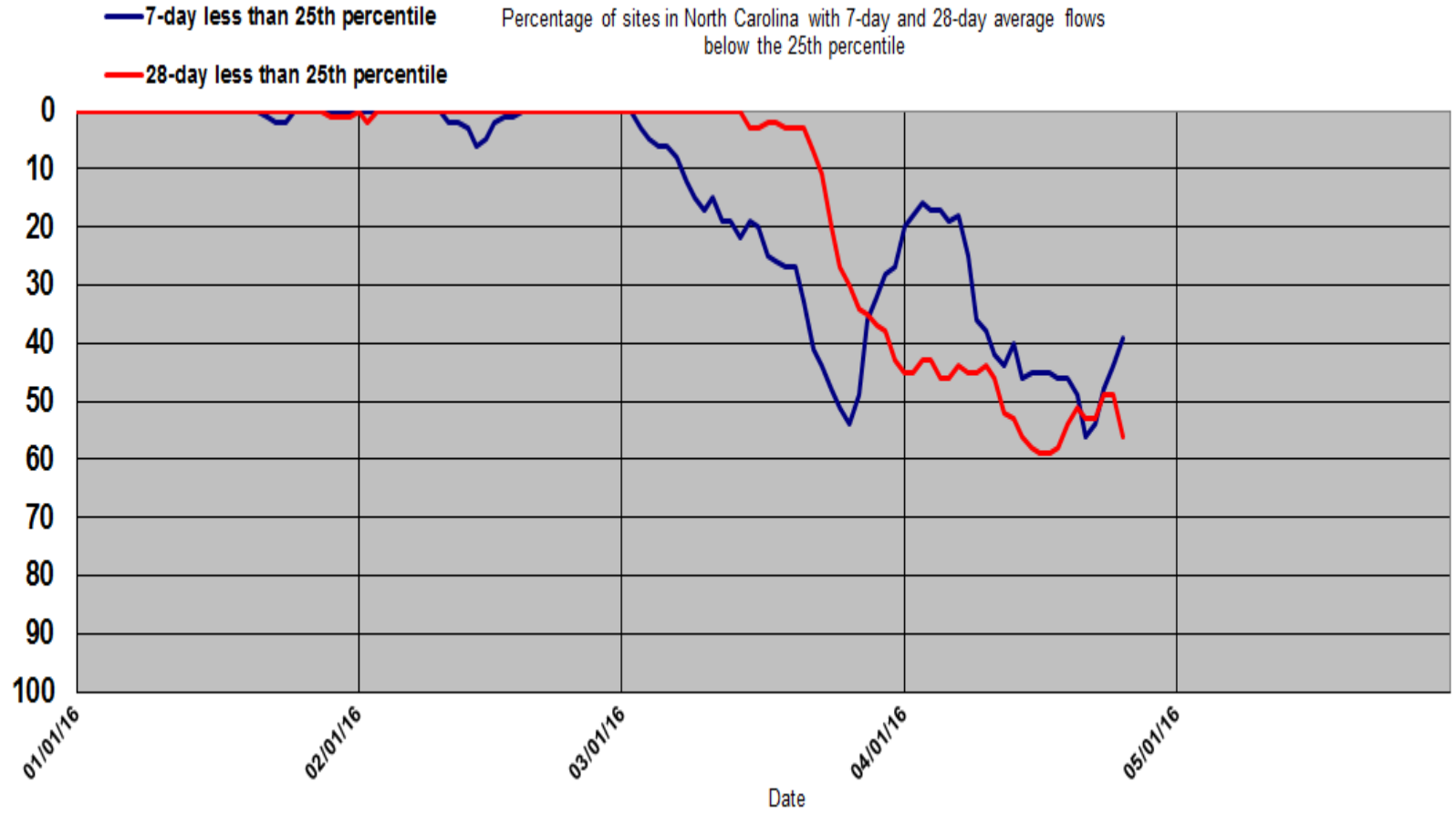


Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS

Available at URL http://waterwatch.usgs.gov/index.php

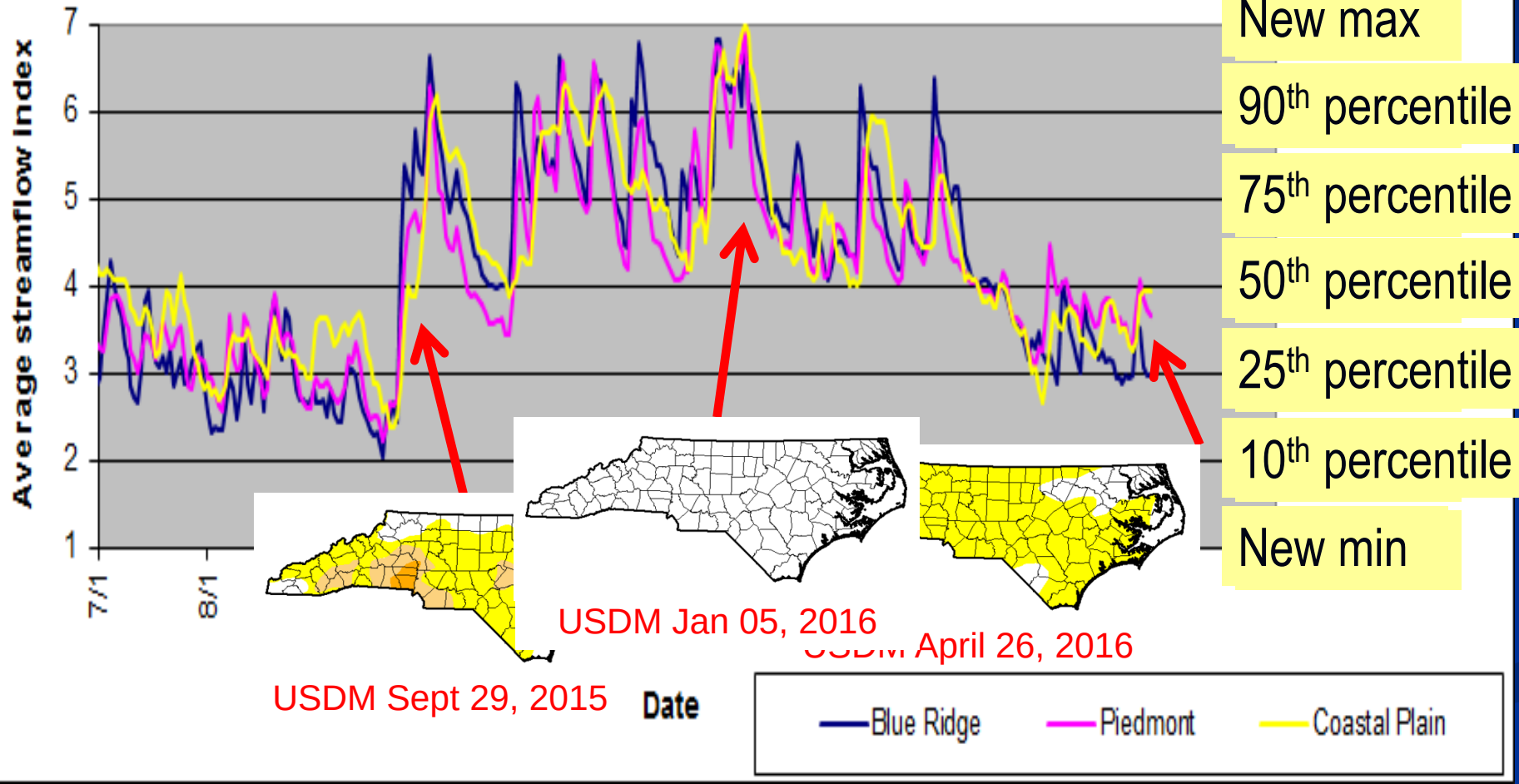
Percentage of sites with 7- and 28-day average flows below normal (< 25th percentile)



USGS

Since January 1, 2016

Average streamflow index (by Province)

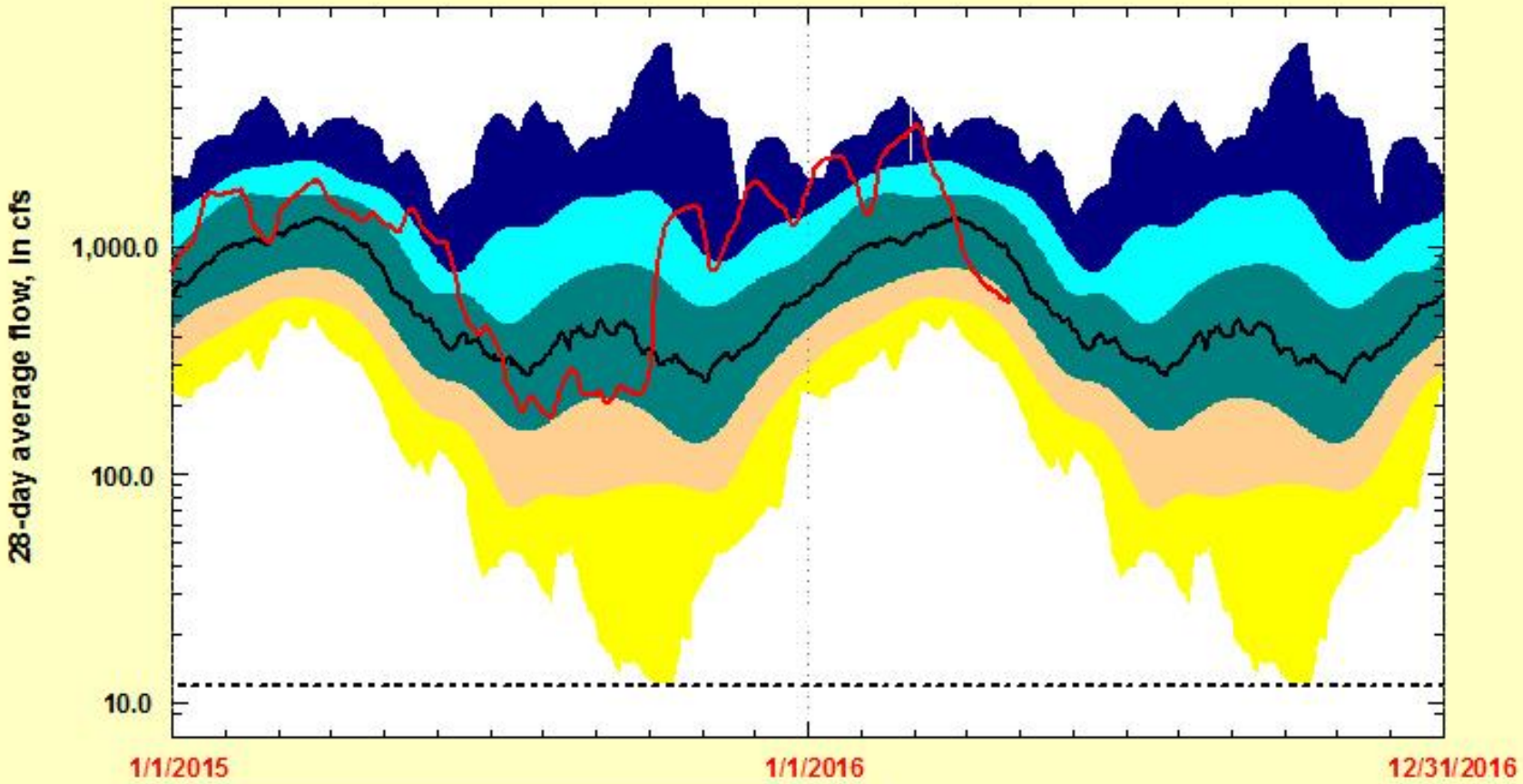


USGS

Sta. 02106500, BLACK RIVER NEAR TOMAHAWK, NC (Sampson County), DA = 676 sqmi

Period of record (POR): 0/0/ through 0/0/

Approx. 65 total years record available to date (Site info from http://waterdata.usgs.gov/nwis/inventory)



90th percentile to max (upper band, very wet conditions)
75th to 90th percentile
25th to 75th percentile (middle band, normal range)
10th to 25th percentile
Min to 10th percentile (lower band, very dry conditions)

Median
Observed 28-day avg flow, 2015-16

POR minimum 28-day average flow (see note at right)

POR minimum 28-day average flow:
11.92 cfs, ending on 10/15/1954

Observed data through 04/26/2016
Statistics based on 10/01/1951 through 09/30/2015

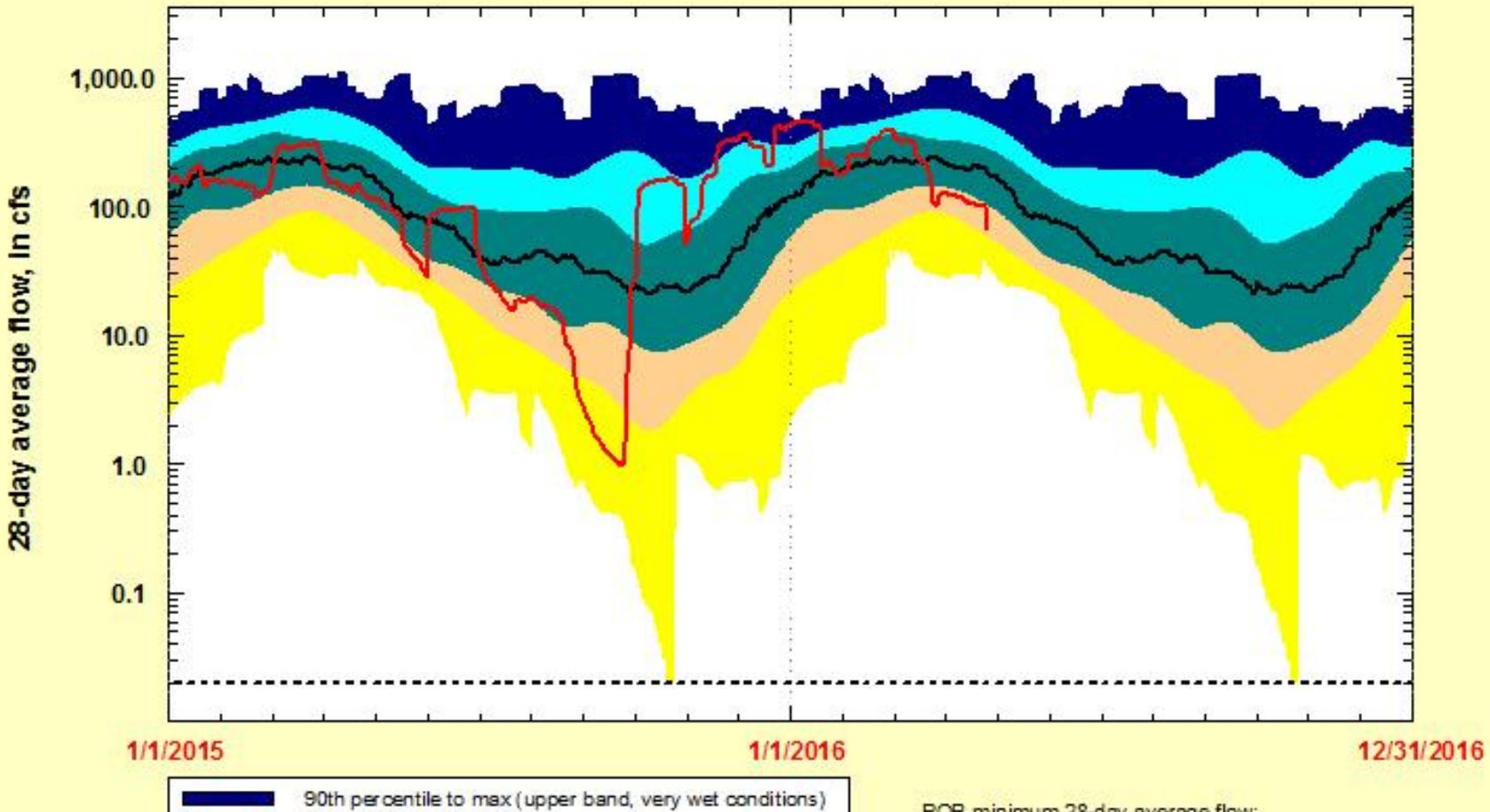
Note: Data and statistics since 09/30/2015 considered provisional and subject to revision.
Plot created: Apr. 27, 2016 10:32:37 AM

USGS

Sta. 02085500, FLAT RIVER AT BAHAMA, NC (Durham County), DA = 149 sqmi

Period of record (POR): 0/0/ through 0/0/

Approx. 91 total years record available to date (Site info from http://waterdata.usgs.gov/nwis/inventory)



POR minimum 28-day average flow:
0.02 cfs, ending on 10/24/2007

Observed data through 04/26/2016
Statistics based on 08/01/1925 through 09/30/2015

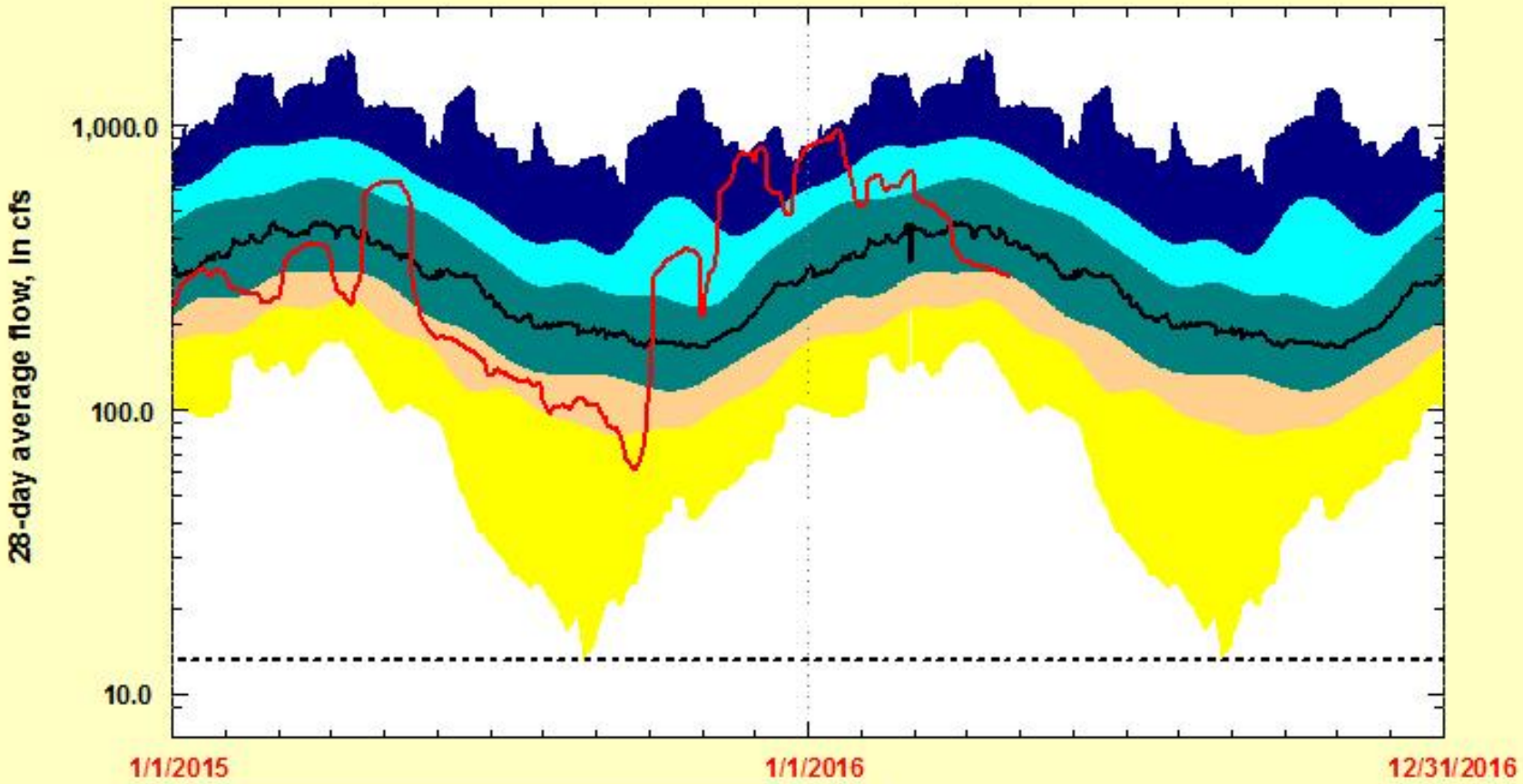
Note: Data and statistics since 09/30/2015 considered provisional and subject to revision.
Plot created: Apr. 27, 2016 10:31:01 AM

USGS

Sta. 02118000, SOUTH YADKIN RIVER NEAR MOCKSVILLE, NC (Rowan County), DA = 306 sqmi

Period of record (POR): 0/0/ through 0/0/

Approx. 78 total years record available to date (Site info from http://waterdata.usgs.gov/nwis/inventory)



90th percentile to max (upper band, very wet conditions)
75th to 90th percentile
25th to 75th percentile (middle band, normal range)
10th to 25th percentile
Min to 10th percentile (lower band, very dry conditions)

Median
Observed 28-day avg flow, 2015-16

POR minimum 28-day average flow (see note at right)

POR minimum 28-day average flow:
13.24 cfs, ending on 08/26/2002

Observed data through 04/26/2016
Statistics based on 10/01/1938 through 09/30/2015

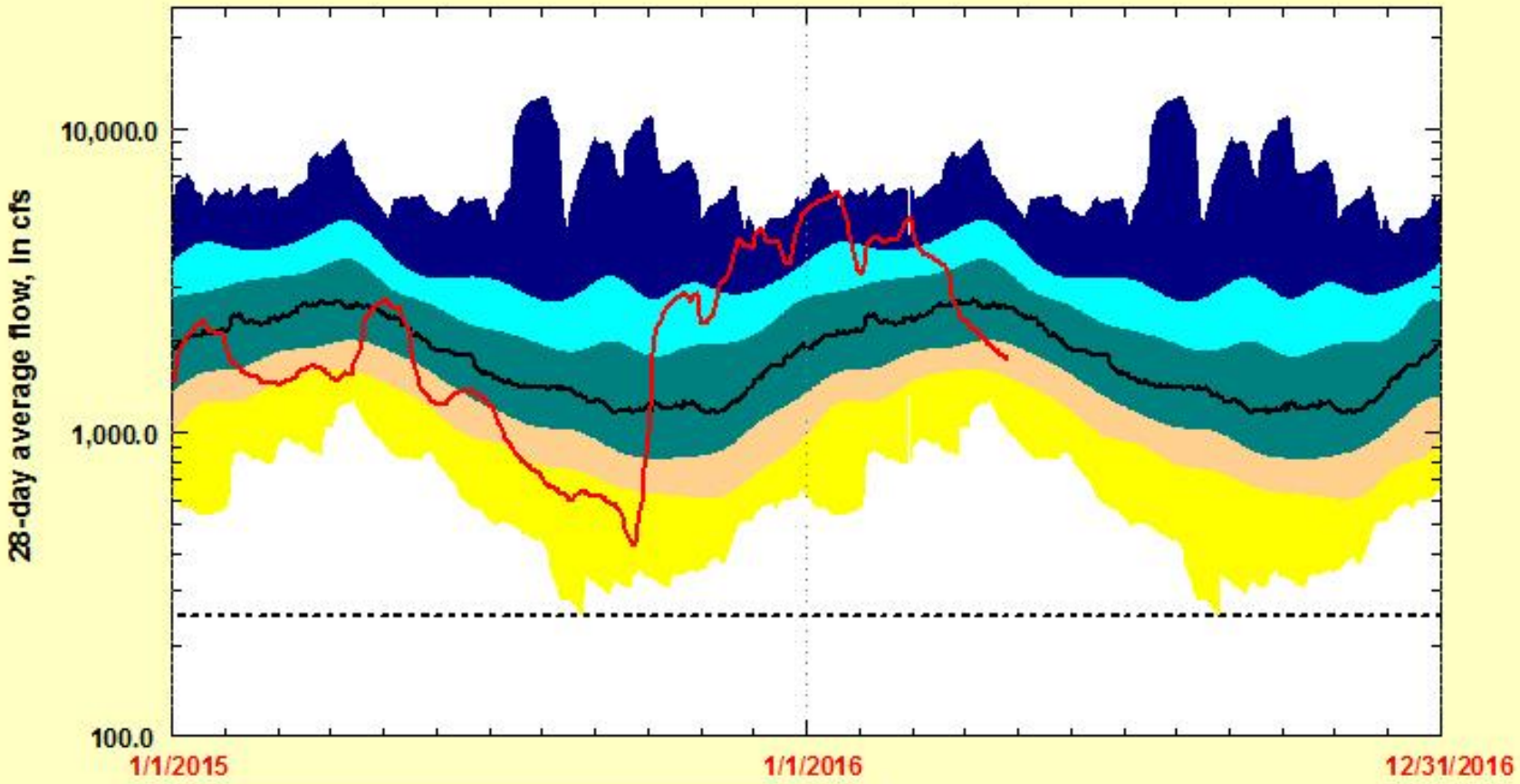
Note: Data and statistics since 09/30/2015 considered provisional and subject to revision.
Plot created: Apr. 27, 2016 10:34:19 AM

USGS

Sta. 03451500, FRENCH BROAD RIVER AT ASHEVILLE, NC (Buncombe County), DA = 945 sqmi

Period of record (POR): 0/0/ through 0/0/

Approx. 121 total years record available to date (Site info from http://waterdata.usgs.gov/nwis/inventory)



90th percentile to max (upper band, very wet conditions)
75th to 90th percentile
25th to 75th percentile (middle band, normal range)
10th to 25th percentile
Min to 10th percentile (lower band, very dry conditions)

Median
Observed 28-day avg flow, 2015-16

POR minimum 28-day average flow (see note at right)

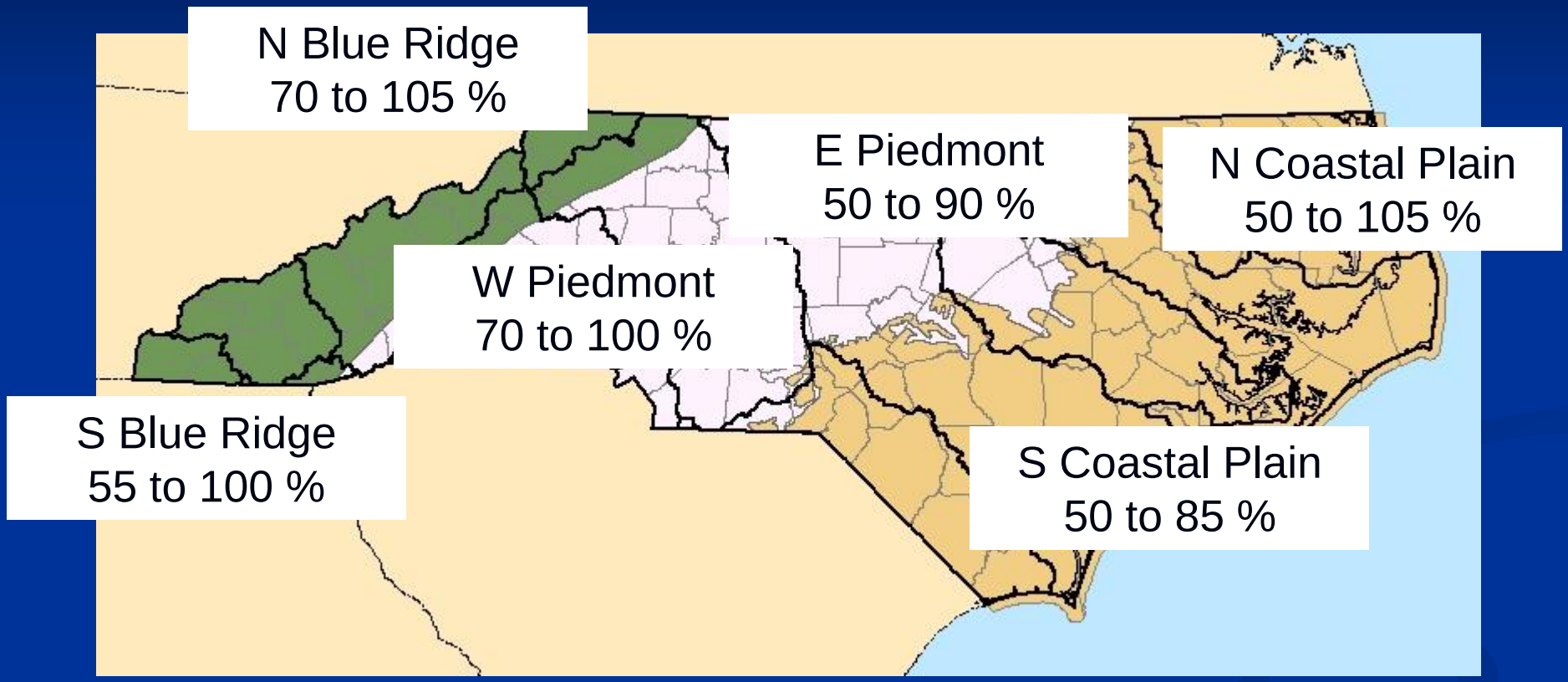
POR minimum 28-day average flow:
248.96 cfs, ending on 08/25/2008

Observed data through 04/26/2016
Statistics based on 10/01/1895 through 09/30/2015

Note: Data and statistics since 09/30/2015 considered provisional and subject to revision.
Plot created: Apr. 27, 2016 10:36:13 AM

USGS

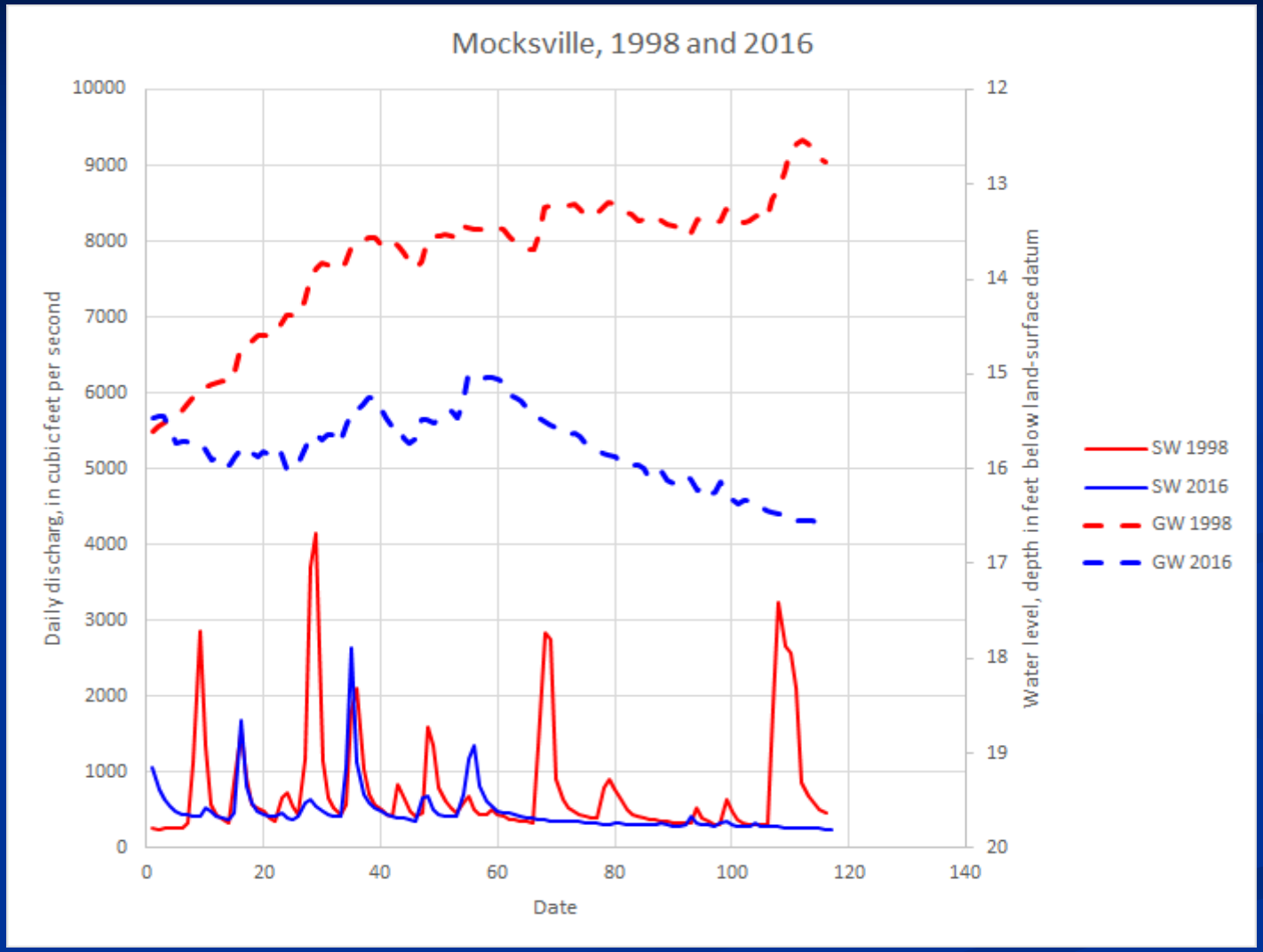
Typical ranges in percentage of median flow since March 1…(by region)



…as of April 26

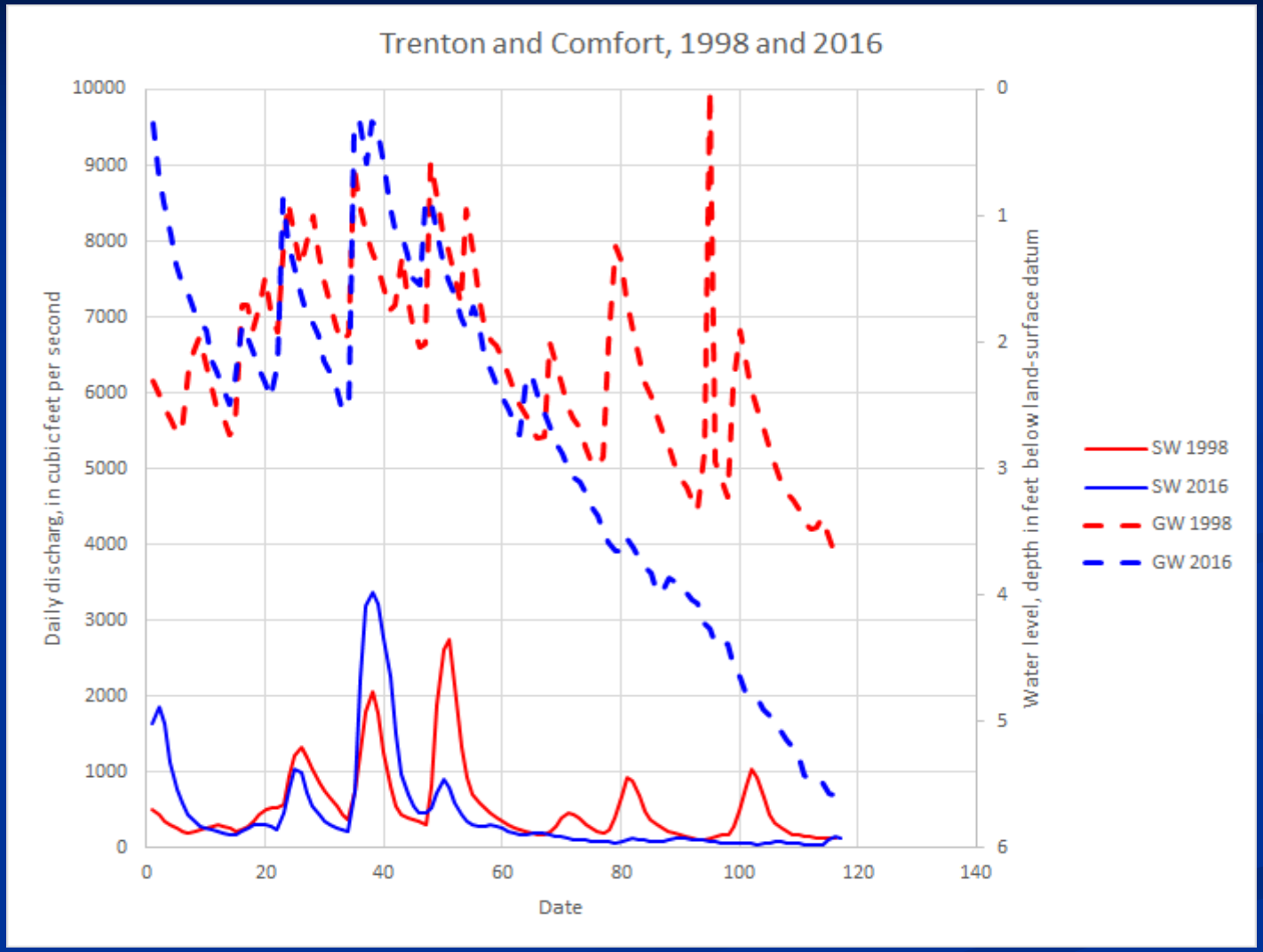
USGS

Comparing Jan–April,1998 and 2016…



Looking ahead? A Piedmont comparison…

Comparing Jan–April,1998 and 2016…



Looking ahead? A Coastal Plain comparison…

In closing…

- Questions
- Concerns

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Flat River at Bahama
Durham County

USGS