



Drought Monitoring in Virginia

Metropolitan Washington Council of Governments

Brian McGurk, Virginia DEQ, Office of Water Supply

March 19, 2018

Drought conditions aren't new:

- * Droughts will occur periodically
- * Planning ahead is key
- * Right: excerpt published September 2, 1869, (copyright © The New York Times)
- * Below: Lake Chesdin, Chesterfield County VA



The End of the Drought in Virginia.

From the Richmond Dispatch, Aug. 31.

After a long and parching drought, commencing on the 1st day of June, covering a period of eighty-nine days, we are at last having copious and refreshing showers. During this long period of drought rain fell, it is true, two, or perhaps three times; but none of these showers made the ground wet more than two and a half inches, and in every case the hot sunshine of the succeeding days obliterated all its effects. Rain commenced falling here between 2 and 3 o'clock on Sunday afternoon, and there were several fine showers before night. We had also a splendid shower yesterday afternoon, continuing about an hour and a half, and coming down freely. Passengers on the Southside and Danville Railroads report refreshing showers in Powhatan, Chesterfield, Prince Edward, Amelia and Cumberland, on yesterday and the day before.

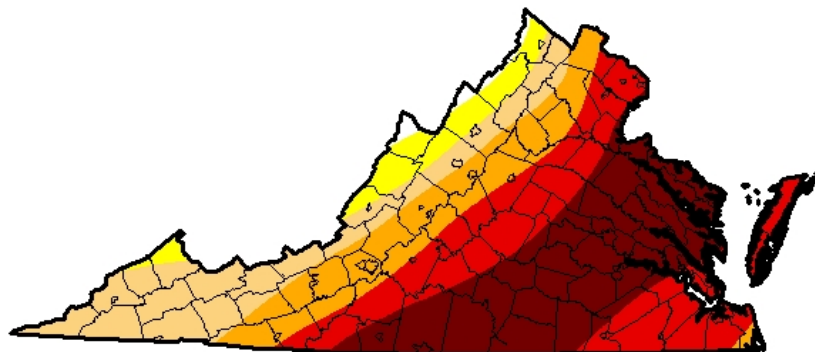
Virginia's Drought Assessment & Response Plan Governs Drought Monitoring & Response in Virginia:

- ❖ Drought Monitoring Task Force
- ❖ Monitoring and Assessment Tools
- ❖ Response Activities

U.S. Drought Monitor Virginia

Drought of 1998-2002:

- Record low stream flows and ground water levels
- Wildfire indices at peak levels
- Most VA counties seeking Federal disaster designation
- Large PWS with <60 days remaining capacity; smaller PWS down to a few days
- Thousands of private well failures



August 20, 2002
(Released Thursday, Aug. 22, 2002)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.23	98.77	92.14	73.47	56.39	30.53
Last Week 8/13/2002	1.17	98.83	88.93	64.56	45.91	18.21
3 Months Ago 5/21/2002	8.73	91.27	65.66	41.66	9.41	0.00
Start of Calendar Year 1/1/2002	0.00	100.00	98.60	36.16	0.00	0.00
Start of Water Year 9/25/2001	97.33	2.67	0.00	0.00	0.00	0.00
One Year Ago 8/21/2001	100.00	0.00	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:
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NOAA/NESDIS/NCDC

Drought planning before 2002: Response oriented (reactive)



<http://droughtmonitor.unl.edu/>



Virginia Drought Assessment and Response Plan

- * Initiated in 2003 in response to 1998 – 2002 Drought
- * Meant to be **proactive**
- * Recognizes the complexity of **Hydrologic Drought** and its interactions with water supply
- * Recognizes the relative sparseness of monitoring points
- * Relies on objective triggers, as well as the professional judgment of members of the Drought Monitoring Task Force and the Commonwealth Drought Coordinator
- * No predetermined exemptions

Drought Monitoring Task Force

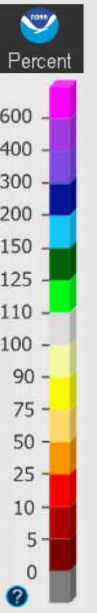
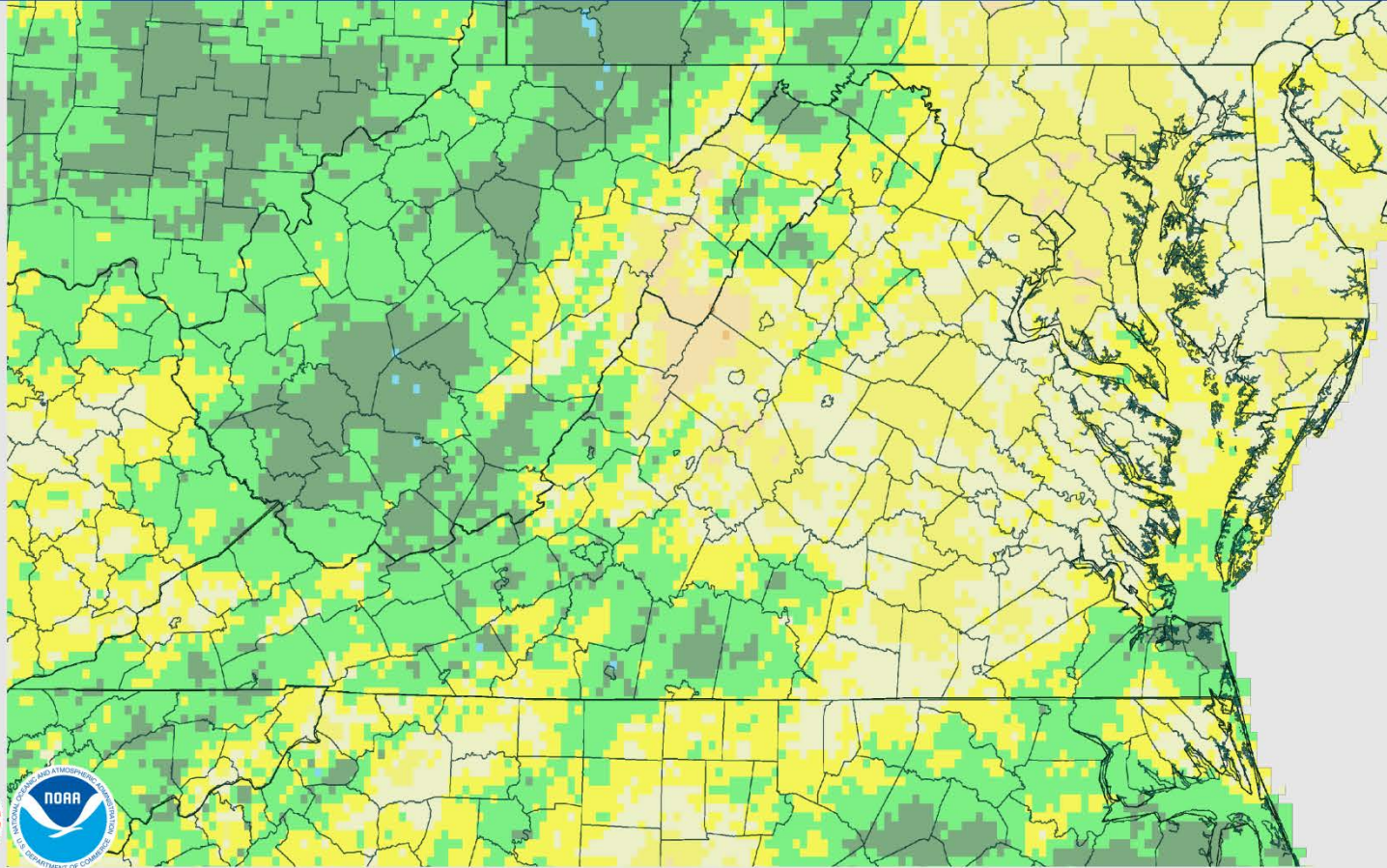
- * **Drought Monitoring Task Force (DMTF)**
 - * Composed of staff from state and federal agencies
 - * VDEQ, VDH, VDEM, VDOF, VDACS, VDGIF
 - * NOAA-NWS, USDA-FSA, USGS, USACE, UVA-Climatology Office
 - * Monitors **hydrologic indicators**, supplemented by meteorological, agricultural and public supply drought indicators
 - * Meets regularly and advises/makes recommendations to Virginia Drought Coordinator regarding drought stage declarations
 - * Governor, (or Drought Coordinator as designee) makes final decisions regarding Drought Declarations

Precipitation Monitoring

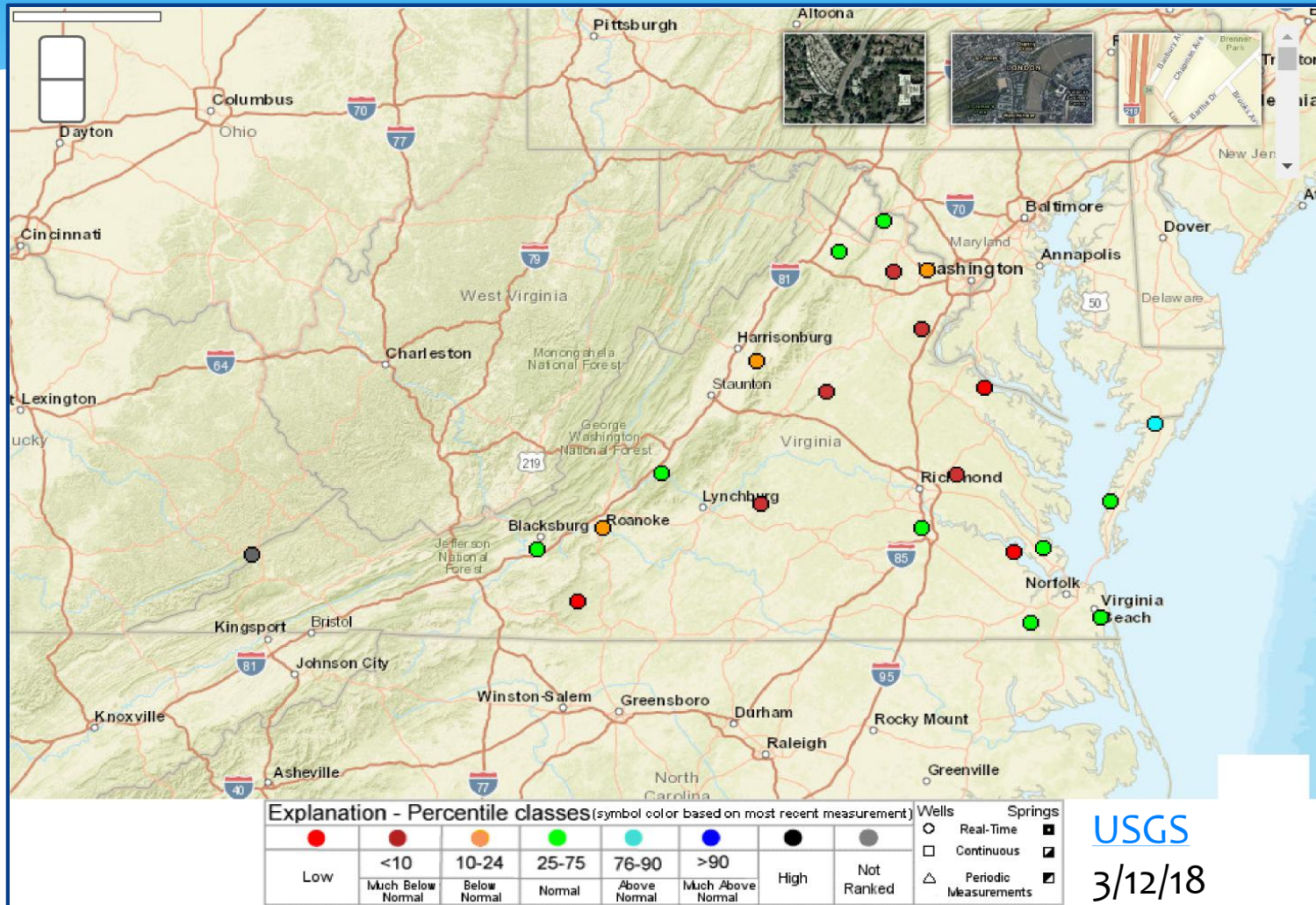
July 18, 2017 Water Year to Date (Oct. 1) Percent Precipitation

Created on: July 19, 2017 - 20:36 UTC

Valid on: July 18, 2017 12:00 UTC

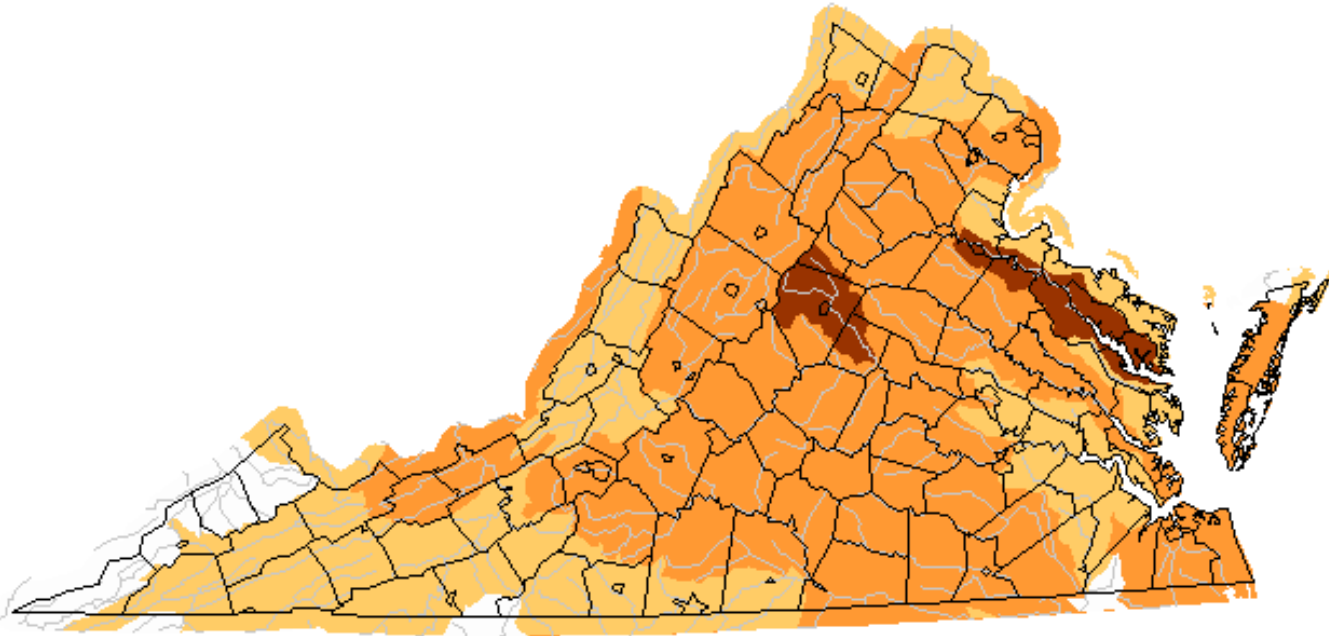


USGS Climate Response Well Network



Surface Water Discharge Monitoring

Thursday, March 15, 2018

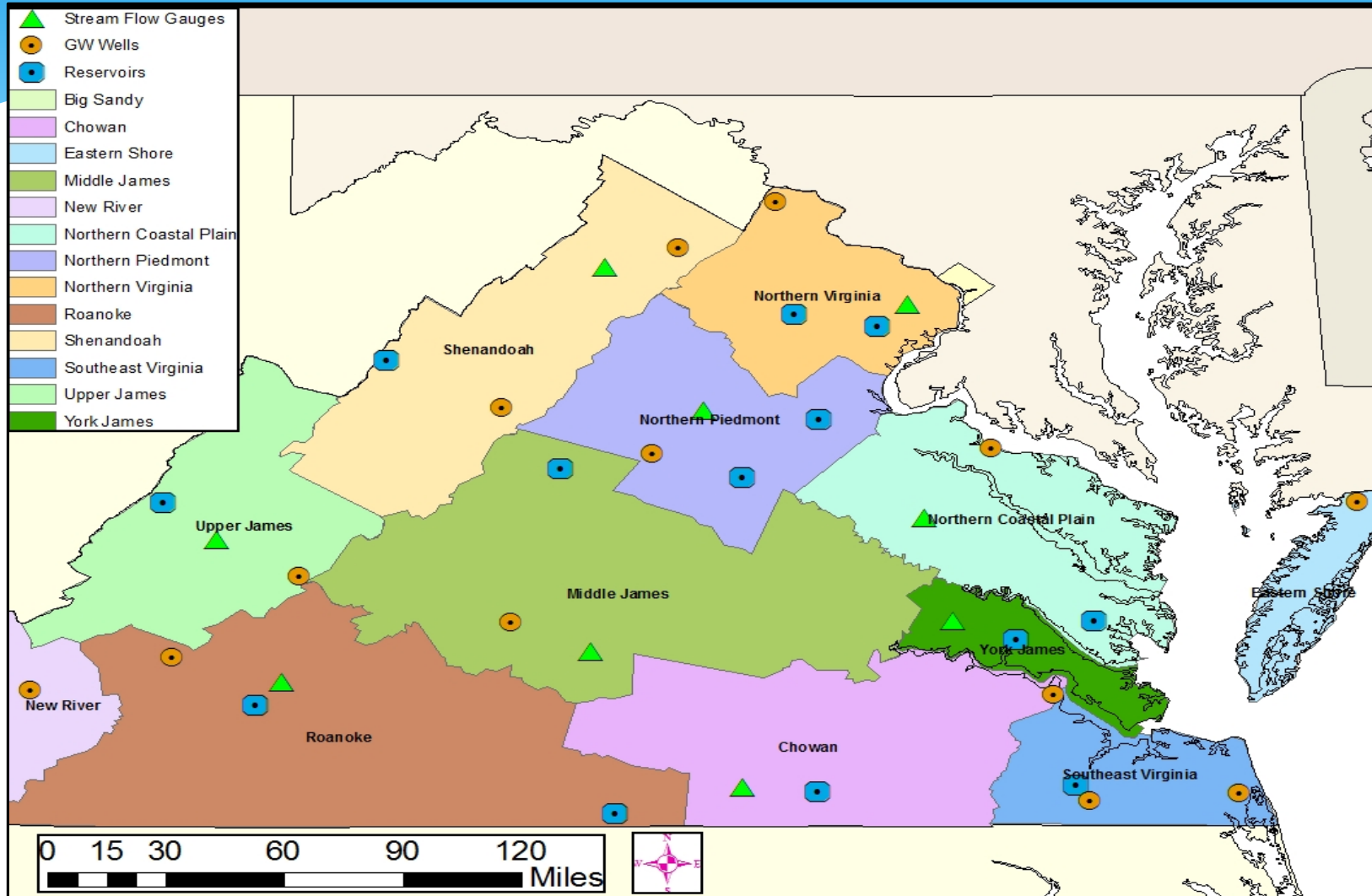


Below normal 7-Day Avg Streamflow compared to historical ([USGS Waterwatch](#))

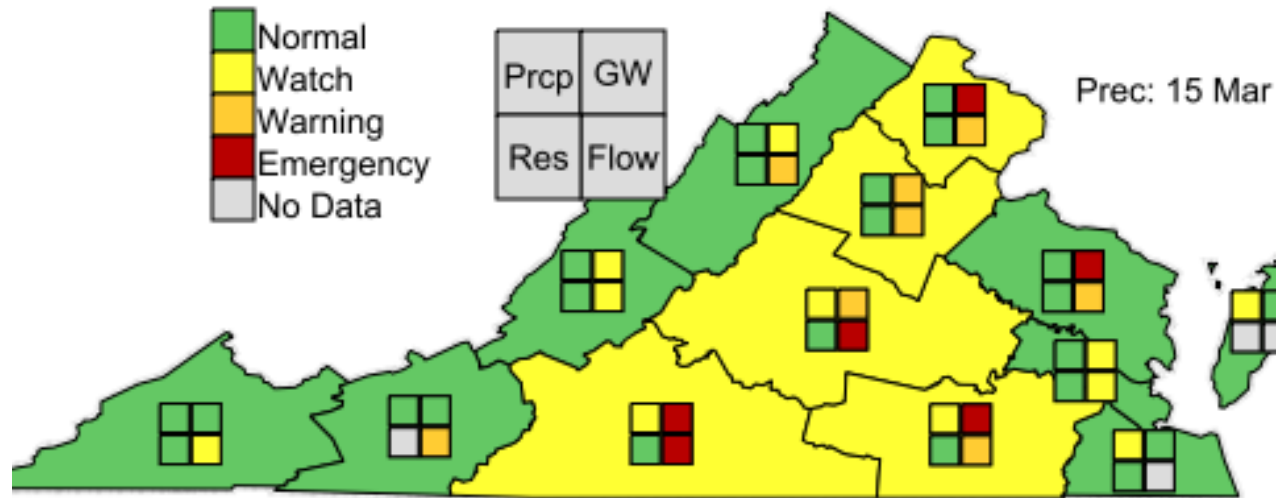


Explanation - Percentile classes				
Low	≤5	6-9	10-24	insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

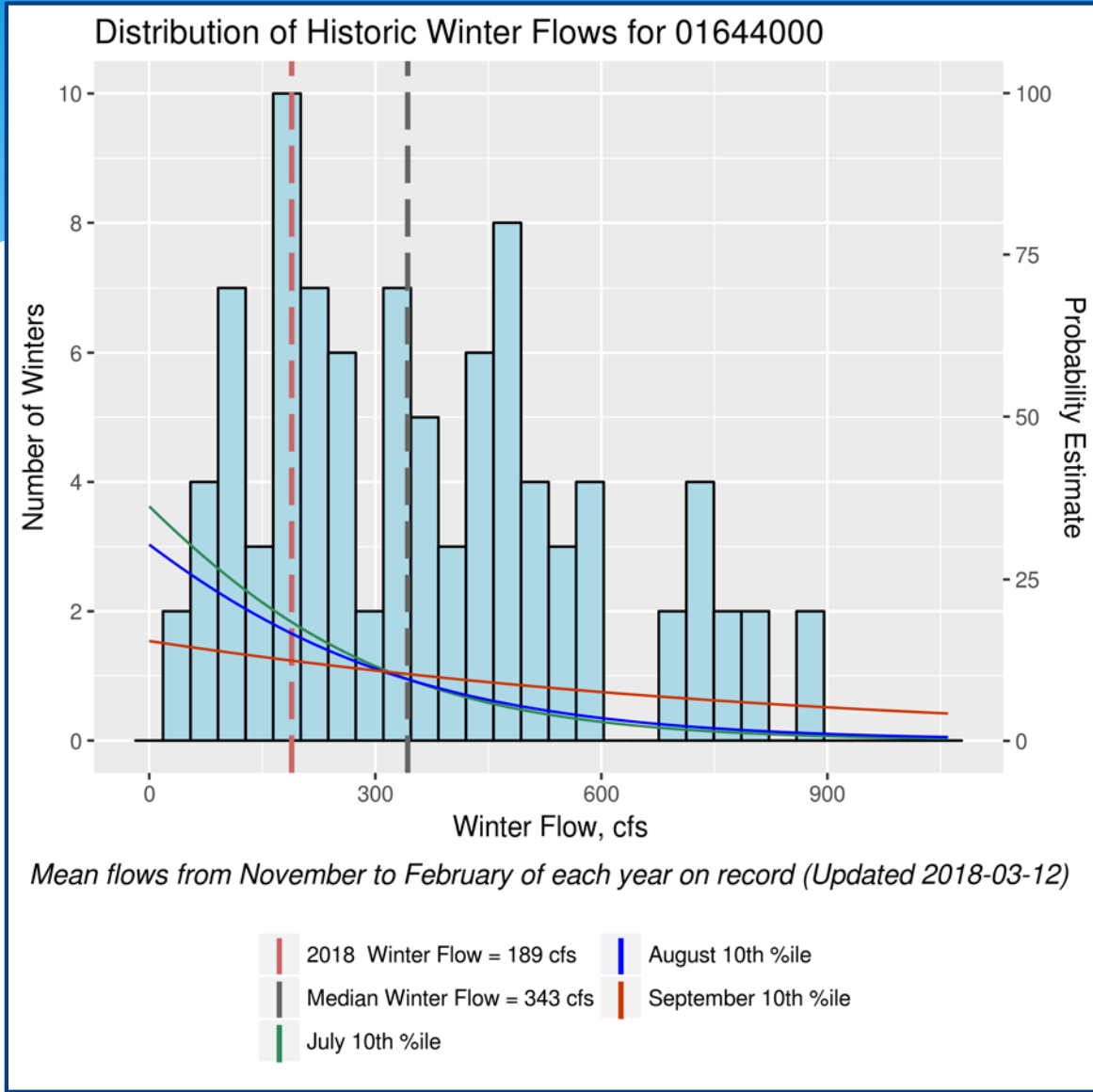
Evaluation Regions & Key Monitoring Locations



Virginia Drought Status Map



- * Hydrologic Indicator status is updated daily
- * This example indicates that Drought Watch Advisories are in effect for five regions (see [DEQ Drought web page](#))



Drought Prediction:
 winter stream flow correlated to summer drought flow

Goose Creek near Leesburg, Loudoun County VA

Drought Stages and Responses

- * **Drought Watch:** responses are intended to increase awareness (notification level)
- * **Drought Warning:** responses beyond those conducted during Watch stage when a significant drought event is imminent: voluntary conservation encouraged
- * **Drought Emergency:** responses are required during the height of a significant drought:
 - * Declared by Governor by executive order
 - * Mandatory restrictions on non-essential uses

Drought Preparation

- * **Local governments and public waterworks :**
 - * may impose use restrictions consistent with local conditions
 - * Follow the **Drought Preparedness Plans** in local/regional Water Supply Plans – revise/update where appropriate
 - * **Maximize storage** if at all possible
 - * **Educate** constituents & customers about water conservation & drought
 - * **Arrange** for alternate/emergency water sources
 - * **Monitor** available local drought indicators
 - * During **Normal** times--Don't wait until **Drought** starts

The Virginia [State Water Resources Plan](#) includes an evaluation of the ability of surface and subsurface waters to meet current & future uses during drought conditions

Think “Tornado”

- * **Drought Watch** : “It’s very dry and could get drier. Let’s pay close attention, conserve water and take some proactive steps”
- * **Drought Warning**: “We’re in a Drought that could get worse. Immediate action is needed”
- * **Drought Emergency**: “We don’t ever want to go there, but if we do, we want to minimize the damage”



Questions?



