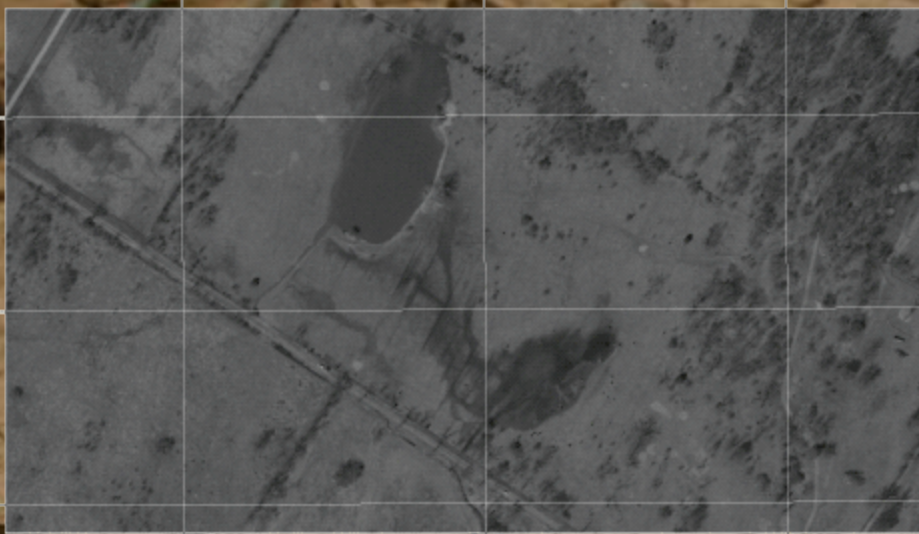


Drought Monitoring in the COG Region

Monday, March 19, 2018



David L. Nelms
Hydrologist/Groundwater Specialist

U.S. Geological Survey
VA-WV Water Science Center
1730 East Parham Road
Richmond, VA 23228
Office: 804-261-2630
dlnelms@usgs.gov

<https://www.usgs.gov/centers/va-wv-water>

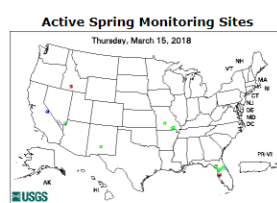
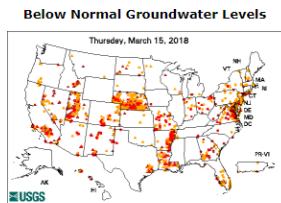
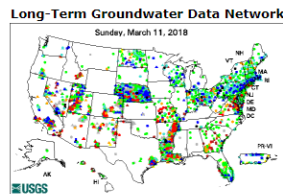
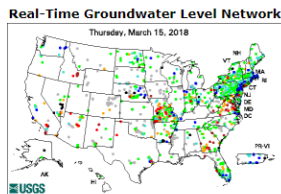
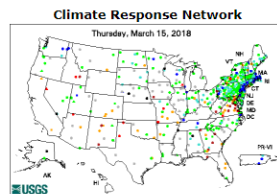
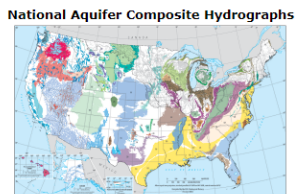
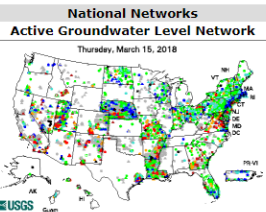


USGS Groundwater Watch

The USGS has a distributed water database that is locally managed. Surface water, groundwater, and water quality data are compiled from these local, distributed databases into a national information system. The groundwater database contains records from about 850,000 wells that have been compiled during the course of groundwater hydrology studies over the past 100 years. Information from these wells is served via the Internet through NWISWeb, the National Water Information System Web Interface. NWISWeb provides all USGS groundwater data that are approved for public release. This large number of sites is excellent for some uses, but complicates retrievals when the user is interested in specific networks, or wells in an active water-level measurement program.

These "groundwater watch" web pages group related wells and data from these active well networks, and provide basic statistics about the water-level data collected by USGS water science centers for Cooperative Programs, for Federal Programs, and from data supplied to us by our customers through cooperative agreements.

Groundwater Watch is maintained by the [Office of Groundwater](#).

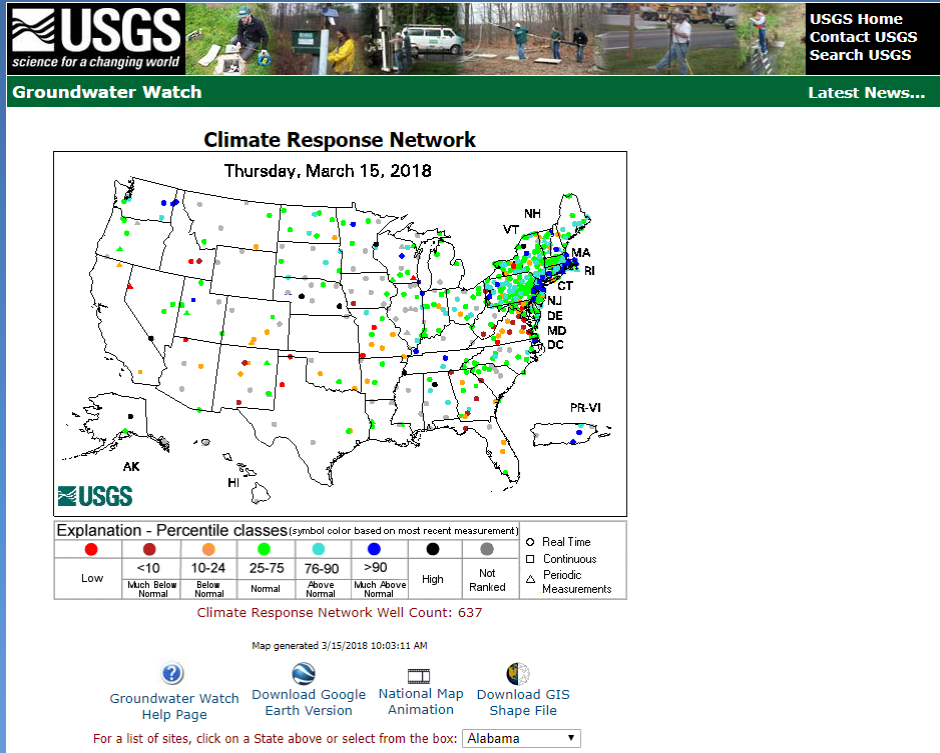


Overview

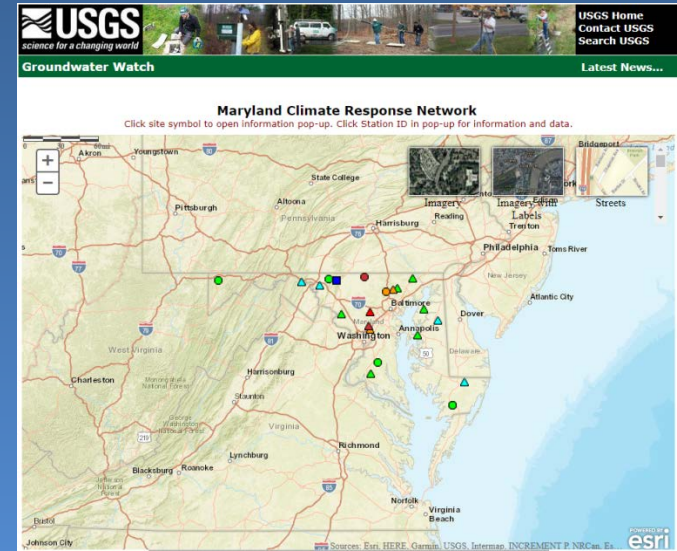
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Austin (2014)
<https://pubs.usgs.gov/sir/2014/5145/>

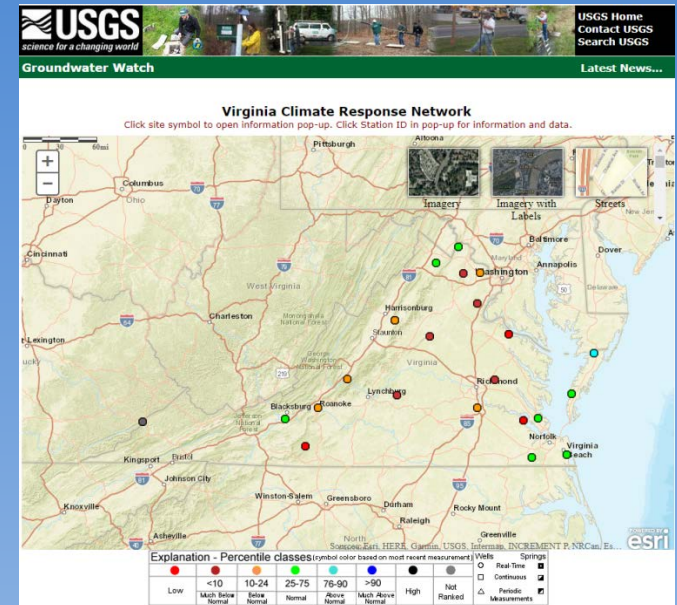
USGS Groundwater Watch Climate Response Network



<https://groundwaterwatch.usgs.gov/net/ogwnetwork.asp?ncd=crn>



<https://groundwaterwatch.usgs.gov/NetMapT1L2.asp?ncd=crn&sc=24>



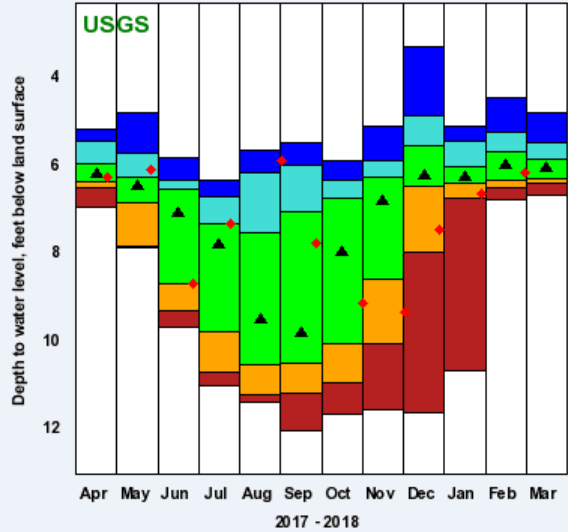
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USGS Groundwater Watch Climate Response Network

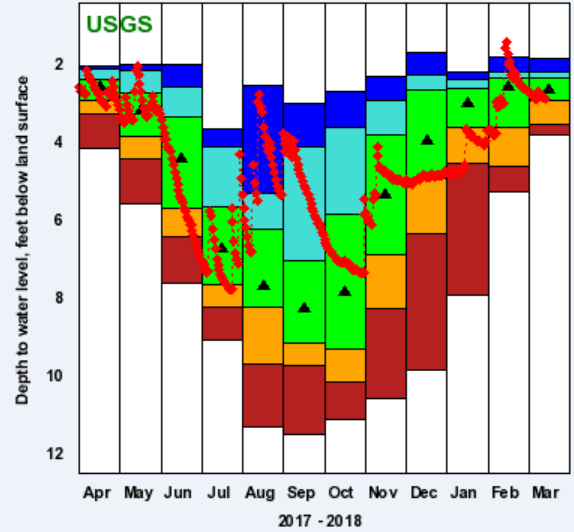
Metropolitan Washington
Council of Governments
Maryland



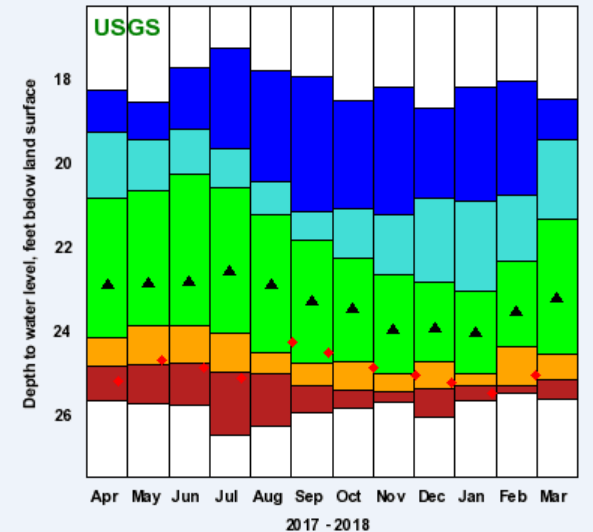
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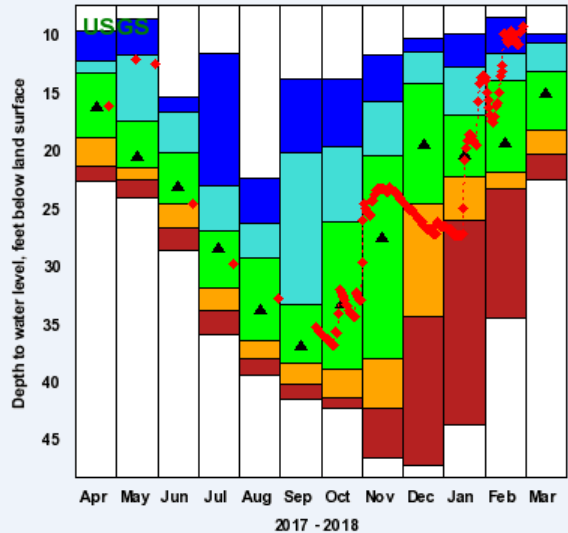
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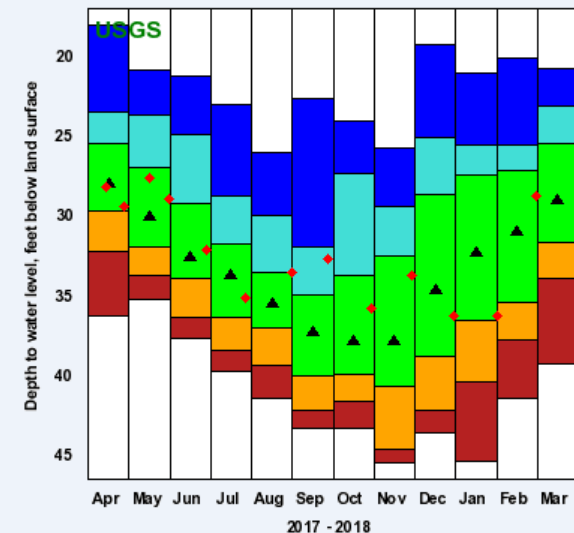
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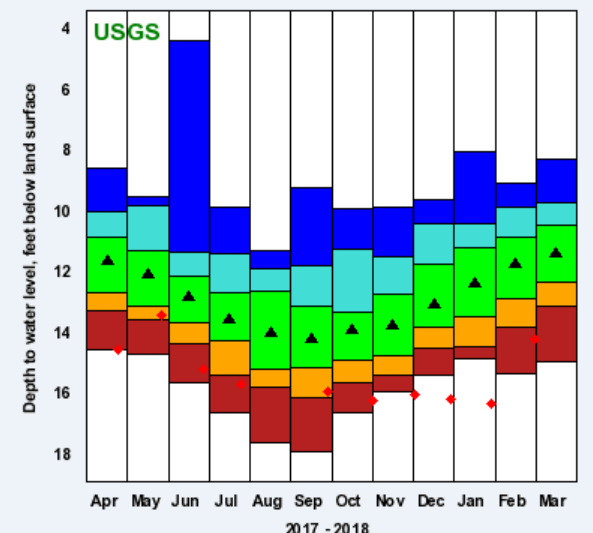
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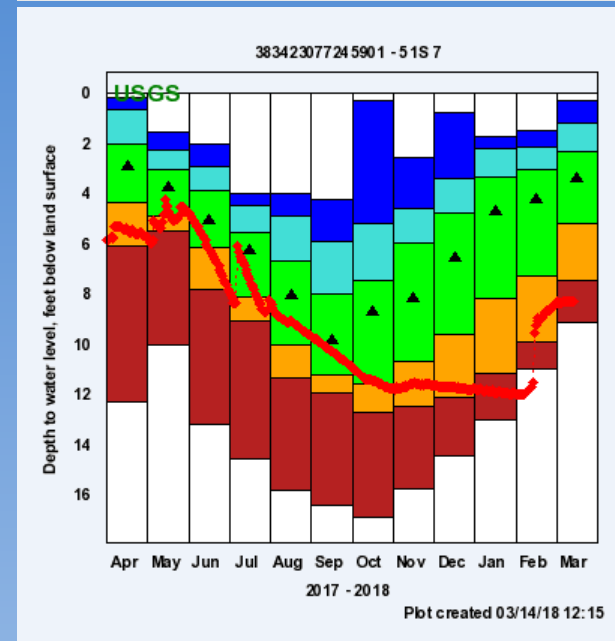
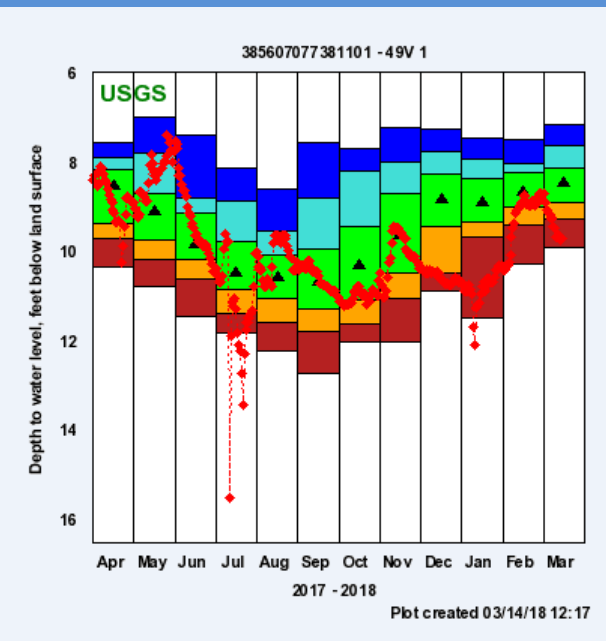
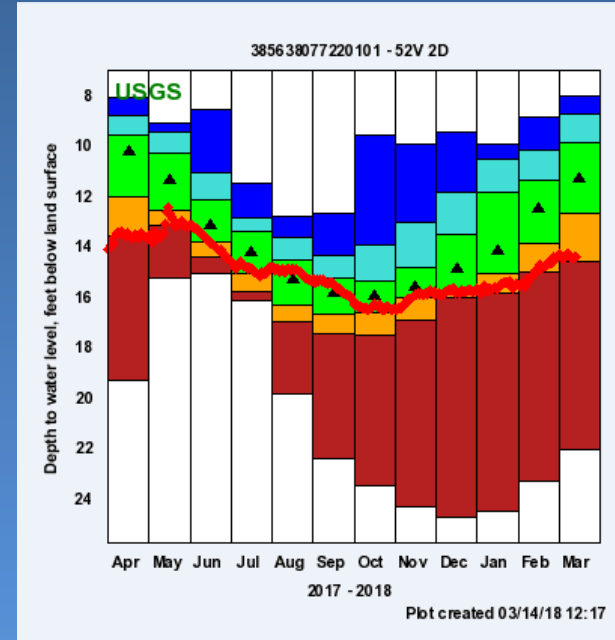
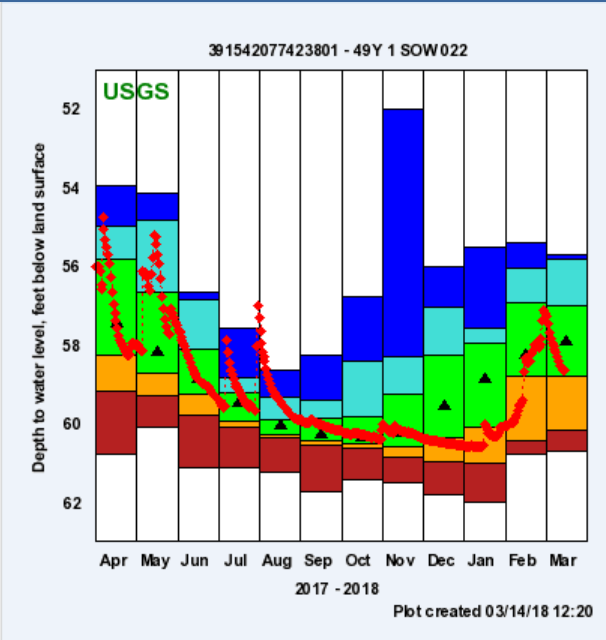


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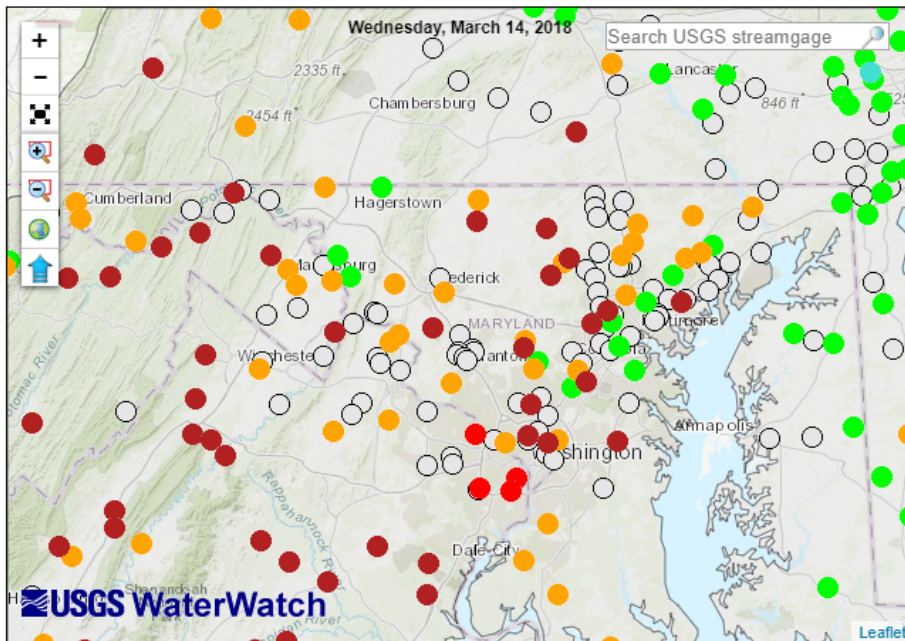
WaterWatch Streamflow Map

Choose a region and then click "GO" to view a regional map

(Warning: It may take several minutes to process)

Map type Daily Flow	Site info: n02	Clear	<input type="checkbox"/> Multiple regions	GO
	Geographic Area	Water Res. Region	<input checked="" type="checkbox"/> Regional map	

Map of daily average streamflow compared to historical streamflow for the day of the year



Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Overview

- Maximum likelihood logistic regression (MLLR)
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Austin (2014)

<https://pubs.usgs.gov/sir/2014/5145/>

USGS Waterwatch Streamflow Data

Drought Data



USGS Home
Contact USGS
Search USGS

WaterWatch

Search WaterWatch ...

- Flood
- Home
- Current Streamflow
- Flood
- Drought
- Past Flow/Runoff
- Animation
- Toolkit
- Toolkit (Internal)
- Annual Summaries
- Additional Information
- About WaterWatch

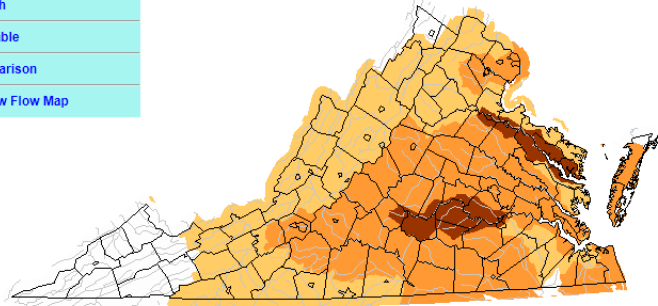
- State Drought Information
- 7-day Below Normal Streamflow
- 14-day Below Normal Streamflow
- 28-day Below Normal Streamflow
- Monthly Below Normal Streamflow
- Site Duration Hydrograph (streamflow)
- State Duration Hydrograph (runoff)
- Cumulative Streamflow Hydrograph
- Drought Table
- Map Comparison
- Record Low Flow Map

Map | Plot | HUC Map | Web Map

Map of below normal 14-day average streamflow compared to historical streamflow for the day of year (Virginia)

Virginia or Water-Resources Regions

Hednesday, March 14, 2018



Choose a data retrieval option and select a location on the map

- List of all stations
- Single station
- Nearest stations

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	

Types of Data

- Short- and long-duration below normal streamflow
- Duration and cumulative streamflow hydrographs
- Drought tables
- Record low maps

Accessibility | FOIA | Privacy | Policies and Notices

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

URL: <https://waterwatch.usgs.gov>

Page Contact Information: [Contact USGS](#)

Page Last Modified: Thursday, March 15, 2018

https://waterwatch.usgs.gov/index.php?id=ww_drought



<https://waterwatch.usgs.gov/>



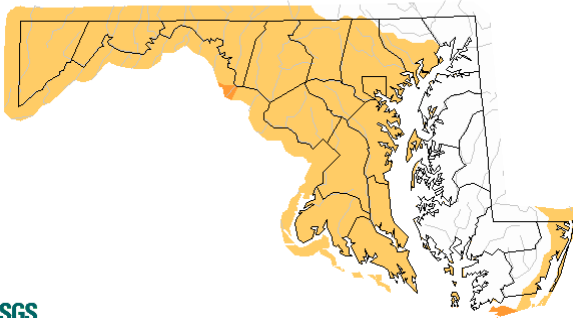
USGS Waterwatch Streamflow Data

Drought Data

Overview

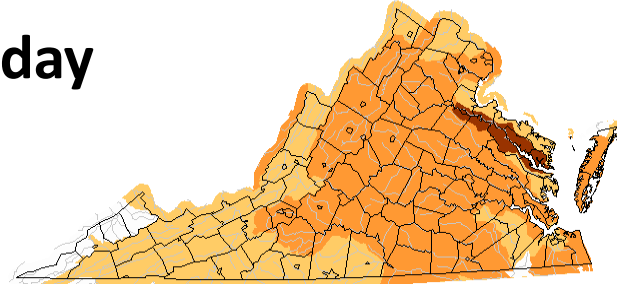
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Hednesday, March 14, 2018

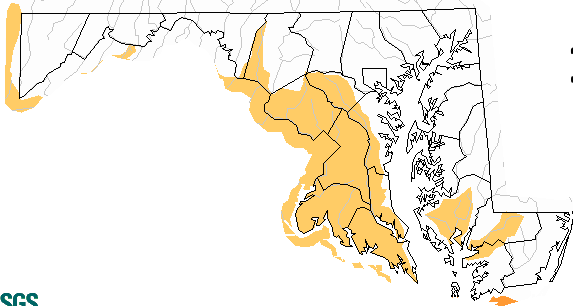


7-day

Hednesday, March 14, 2018

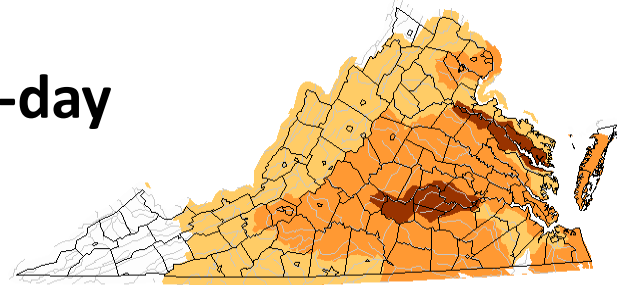


Hednesday, March 14, 2018

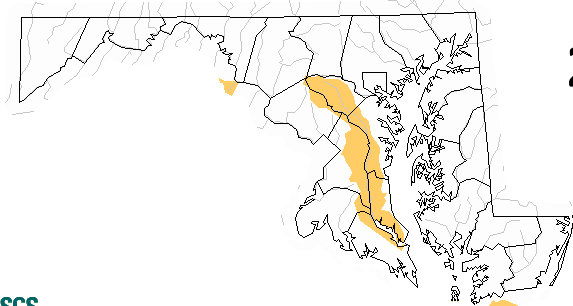


14-day

Hednesday, March 14, 2018

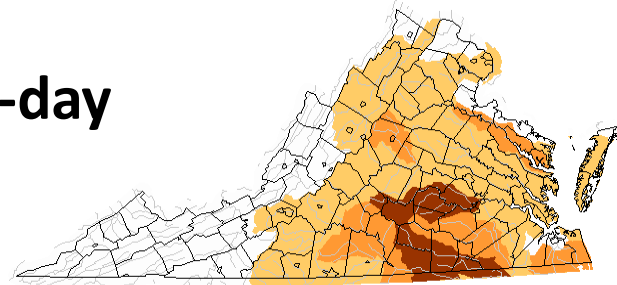


Hednesday, March 14, 2018



28-day

Hednesday, March 14, 2018



USGS Virginia Drought Streamflow Probability Application

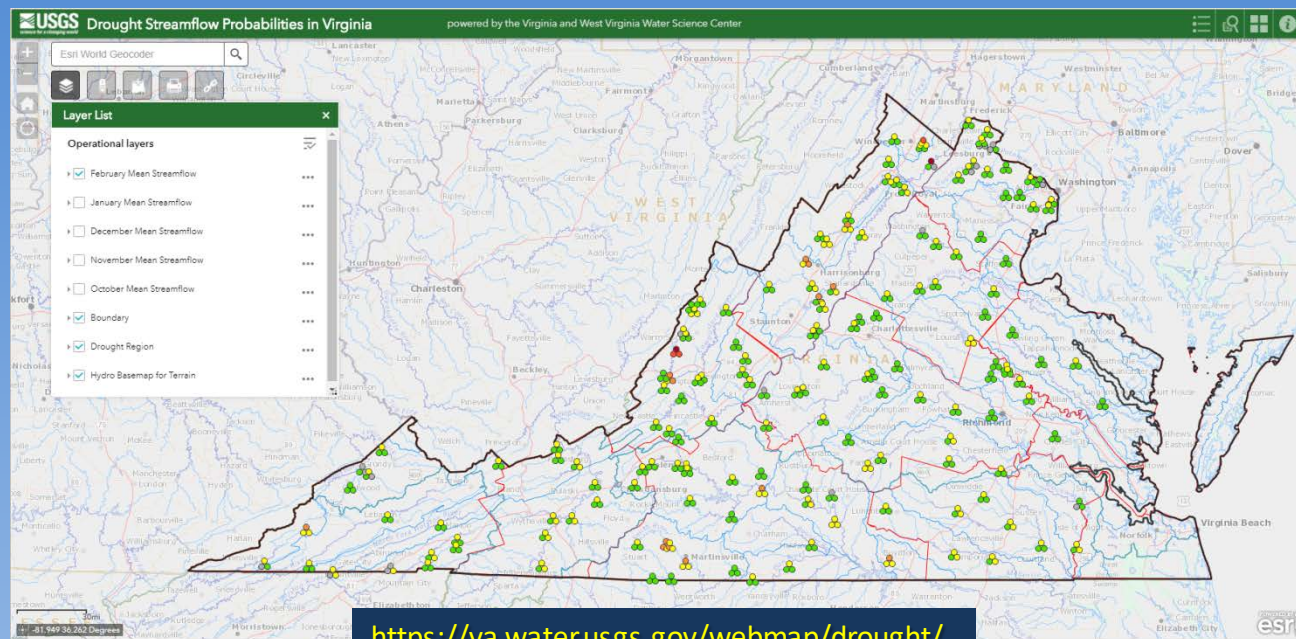
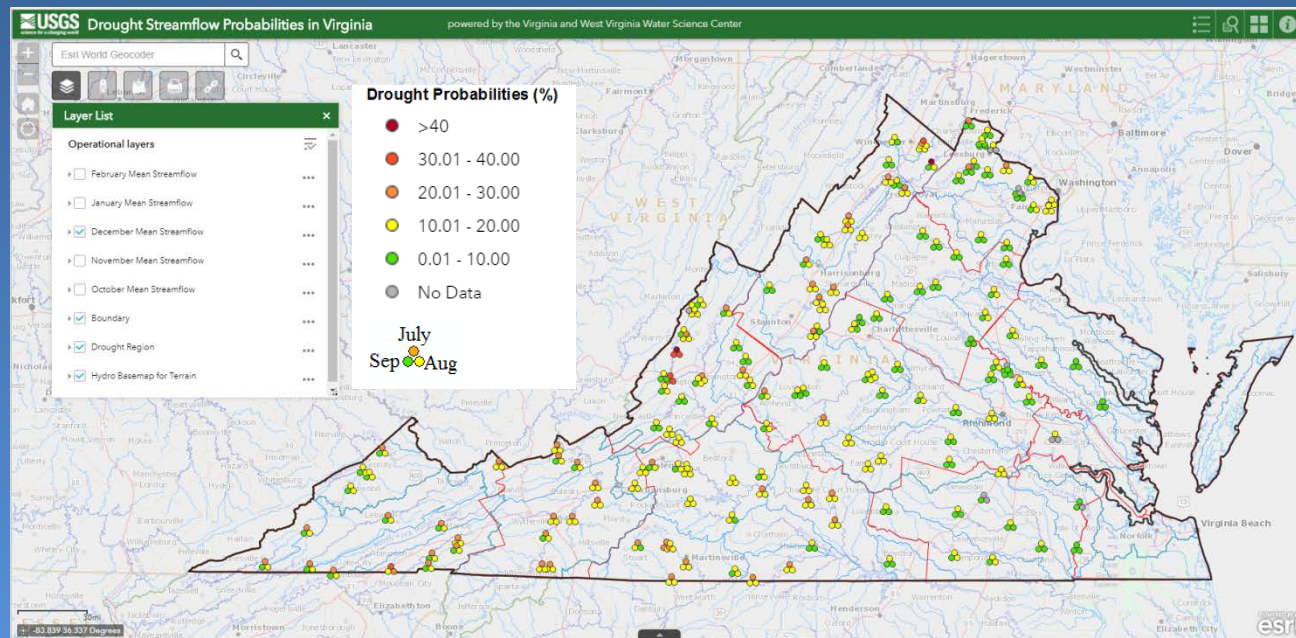
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Austin (2014)

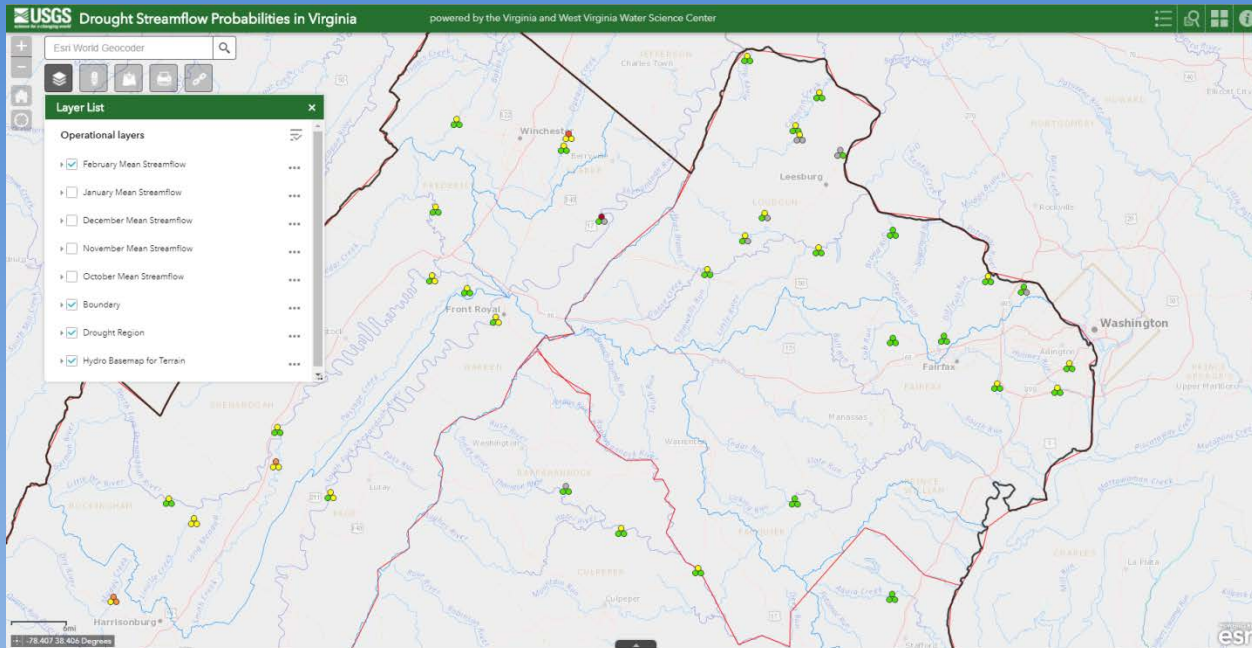
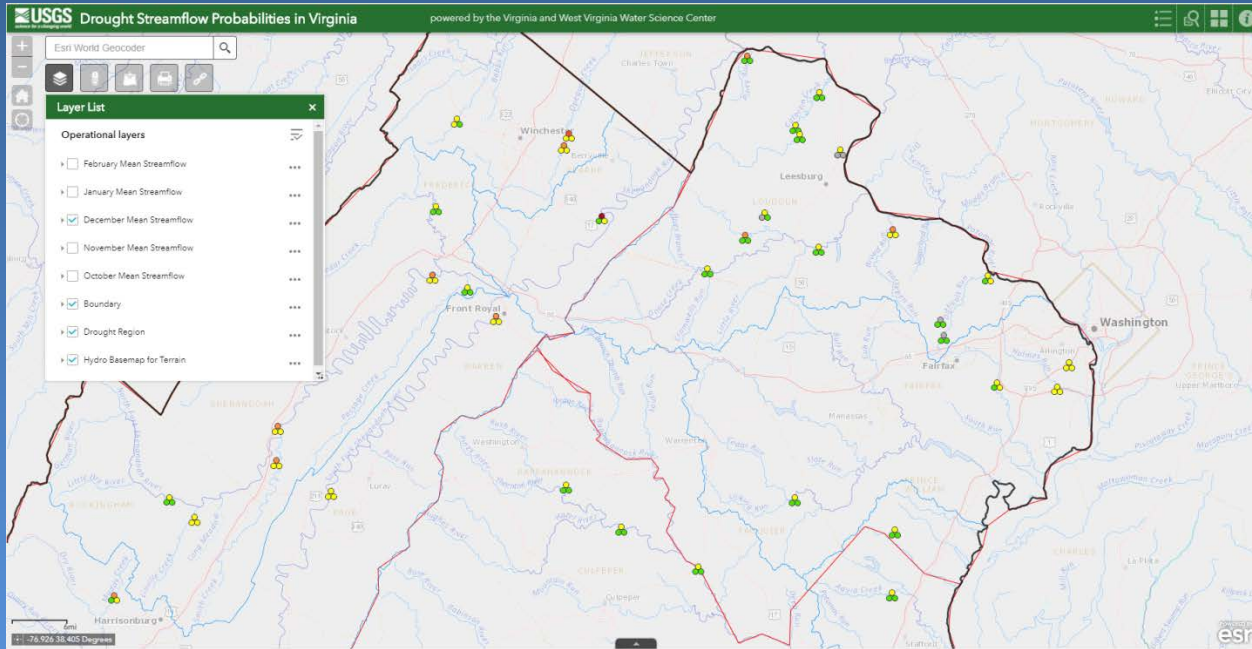
<https://pubs.usgs.gov/sir/2014/5145/>

<https://va.water.usgs.gov/webmap/drought/>

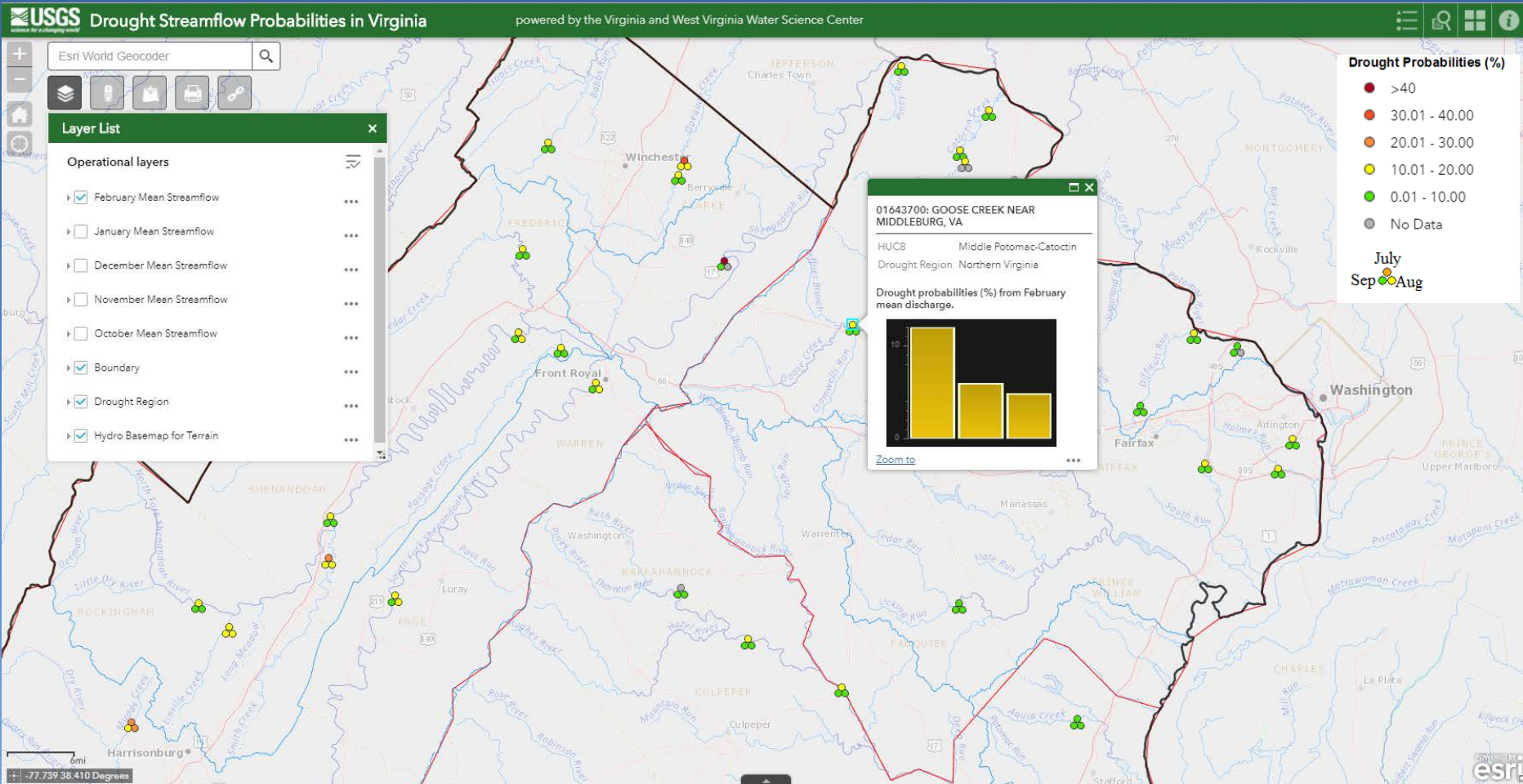


USGS Virginia Drought Streamflow Probability Application

Metropolitan Washington Council of Governments



USGS Virginia Drought Streamflow Probability Application

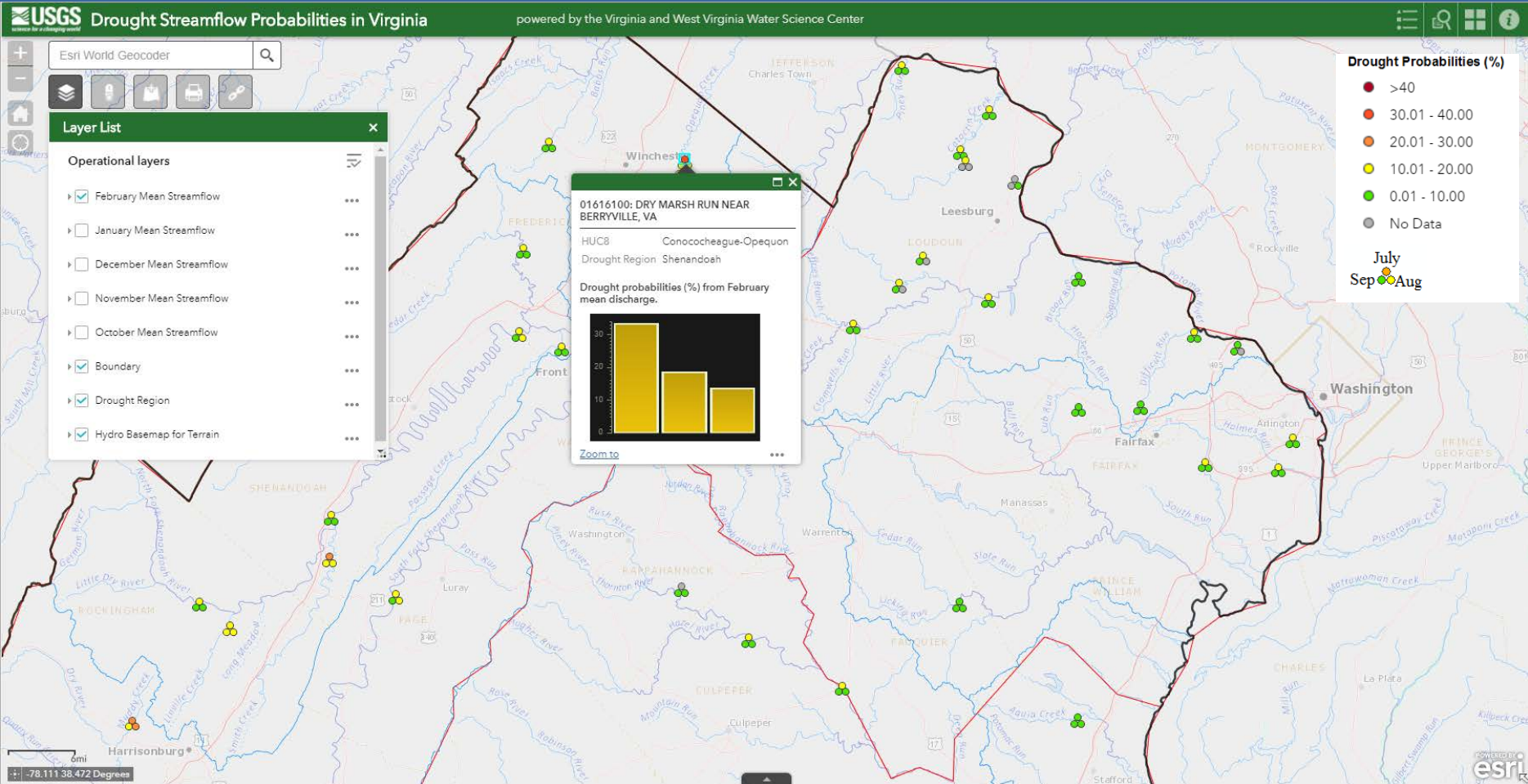


01643700 GOOSE CREEK NEAR MIDDLEBURG, VA

Based on Feb 2018 mean monthly streamflow

Jul 2018	11.94%
Aug 2018	5.92%
Sep 2018	4.79%

USGS Virginia Drought Streamflow Probability Application



01616100 DRY MARSH RUN NEAR BERRYVILLE, VA

Based on Feb 2018 mean monthly streamflow

Jul 2018	33.32%
Aug 2018	18.59%
Sep 2018	13.57%