



DROUGHT MONITORING IN THE METROPOLITAN WASHINGTON REGION

March 19, 2018

Workshop Summary

Meeting materials are posted on COG's Website:

<https://www.mwcog.org/events/2018/3/19/drought-monitoring-in-the-cog-region/>

DECISIONS:

- It was decided that COG should work with utilities and others to evaluate voluntary and mandatory water conservation assumptions.
- It was decided that the September 2018 ICPRB drought exercise would be used to evaluate next generation drought response tools.
- It was decided that COG should work with other stakeholders to re-evaluate the drought plan triggers.
- It was decided that using a forecast approach to estimate the probability of drought consequences would be helpful.

PROPOSED ACTIONS:

- COG will work with water utilities in the region to analyze relevant data and propose updated data-driven conservation guidelines.
- ICPRB will convene an exercise planning team to design the 2018 drought exercise and include an evaluation of next generation drought response tools.
- COG will convene a drought triggers technical work group to assess the appropriateness of existing watch, warning, and emergency stage triggers.
- COG will work with USGS to update the network of groundwater wells used to report status in the regional drought report.
- COG will work with ICPRB and others to evaluate the potential of using probabilistic forecasts as part of regional drought reporting (e.g., probability of entering the warning or emergency stage).
- **Overview of the Metropolitan Washington Water Supply and Drought Awareness Response Plan**
 - **Presentation by Steve Bieber, COG Chief, Urban Watershed Programs and Homeland Security**
 - Main Points – provided an overview of COG's Water Supply and Drought Plan, role of the CAOs and the Drought Coordination Committee, and a history of drought declarations
 - COG's Plan was created and adopted by the COG Board due to lack of regional coordination during the drought of 1999
 - Two main components – a year round water conservation campaign and four stages with corresponding drought triggers
 - COG's CAO committee declares drought stages with help from the DCTC
 - COG uses the NOAA's U.S. Drought Monitor as a tool to declare stages
 - COG's main role under the plan is to assist with regional communication and coordination
 - Since the Plan was adopted, drought watches were declared in 2002, 2007, and 2010
 - Never declared a Warning or Emergency
 - Additional Information: <https://mwcog.org/drought>

- **Overview of Drought Monitoring in Virginia**
 - **Presentation by Brian McGurk, Water Supply Planner at Virginia Department of Environmental Quality**
 - Main Points – provided an overview of Virginia’s Drought Assessment & Response Plan, the Drought Monitoring Task Force, Monitoring and Assessment Tools, and Response Activities
 - Plan was Initiated in 2003 in response to 1998 – 2002 Drought
 - 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
 - Has similar drought stages to COG and MDE plans – normal, watch, warning, and emergency
 - Drought Monitoring Task Force (DMTF)
 - Composed of staff from state and federal agencies
 - 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
 - Evaluates Precipitation, Streamflows, Groundwater and Reservoir Data
 - Reviews NOAA’s PRISM model for precipitation monitoring
 - Reviews the USGS Climate Response Well Network for groundwater monitoring
 - Reviews USGS Waterwatch for streamflow monitoring
 - Hydrologic indicators are updated daily
 - Virginia is divided up into drought evaluation regions, our region of concern is the Northern Virginia Drought Evaluation Region
 - Working with USGS to predict drought –winter stream flow correlated to summer drought flow
 - Additional Information:
 - <http://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/Drought.aspx>

- **Overview of Drought Monitoring in Maryland**
 - **Presentation by John Smith, Maryland Department of Environmental Resources**
 - The state is divided into regions for monitoring and response, similar to VA
 - Also evaluates precipitation, streamflow, groundwater and reservoir data
 - Similar drought stages – normal, watch, warning, and emergency
 - The Governor’s Water Conservation Advisory Committee created the stages and actions
 - Additional Information:
 - <http://mde.maryland.gov/programs/Water/droughtinformation/Pages/index.aspx>

- **CO-OP Drought Management: Tools, Targets, and Triggers**
 - **Presentation by Cherie Schultz, Interstate Commission of the Potomac River Basin**
 - Main Points – provided an overview of current CO-OP tools, system targets and triggers, and current/upcoming CO-OP events
 - Goals and responsibilities of CO-OP drought operations
 - Maintain 100 MGD flowby at Little Falls dam, optimize use of resources, compile withdrawal data, forecast future river flows, determine reservoir release rates, and keep stakeholders informed
 - Flow forecast – it takes 9 days for flows to reach Little Falls from Jennings Randolph Reservoir – important and tricky to forecast timing
 - CO-OP uses an online data portal to share daily operational data - <https://icprbcoop.org>
 - Withdrawal forecasting will be available soon
 - Low Flow Forecast System (LFFS)
 - In-house streamflow forecasting tool that provides real-time low flow forecasts
 - Reservoir Storage Prediction Tools
 - Help manage reservoirs to maintain sufficient storage to meet demands and

- ensure that all reservoirs 90% full on June 1
 - Individual and system refill prediction tools that uses similar inputs to prediction probability of capacity/refills
 - Targets and Triggers
 - For operations – the Low Flow Allocation Agreement (LFAA) and the Water Supply Coordination Agreement
 - For sources /water restrictions – LFAA, COG’s plan, MD and VA Drought Plans/consumptive use regulations
 - We should consider evaluation of regional water restrictions
 - Upcoming activities – evaluation next generation tools and 2018 Drought Exercise
 - Additional information: <https://www.potomacriver.org/focus-areas/water-resources-and-drinking-water/cooperative-water-supply-operations-on-the-potomac/>
- **Communication and Indicators**
 - **Facilitated Discussion by Lisa Ragain, COG Principal Water Resources Planner**
 - Indicators don’t work on the regional scale
 - Need to think of the end user for indicators and communications - shallow well/aquifer monitoring vs. deep aquifer/ancient water
 - Need to evaluate seasonality
 - Evaluate trouble to come vs. real time data and lag time
 - Need risk-based indicators - predictive models, D1 is too broad for the region to move to drought watch (COG Plan)
 - Evaluate information/message fatigue – drought watch issued too early too often, issue/lift cycle
 - Use a scoreboard, probability data presentation rather than current discrete categories
 - Current COG/State indicators may not be most appropriate for the Potomac Basin - reservoir and streamflow
 - Days of supply indicator is not real time
 - MDE mention that it could consider changes for the 10th - 25th percentile
 - Evaluate changing map colors
 - Rich data/info level of sophistication based on audience
 - Drought depends on what you care about
- **Overview of Evaluation Tools for Regional Water Supply and Drought Conditions**
 - **Precipitation: U.S. and Potomac Basin Drought Monitor**
 - **Presentation by Rich Tinker, NOAA**
 - The U.S. Drought Monitor is created weekly, uses a scale from D0 (normal) to D4 (exceptional drought)
 - It uses various indexes/models and evaluates short and long term conditions on a broad scale
 - It has many authors, not just one – rotates all of the time
 - Drafts are evaluated by over 300 participants, they incorporate local feedback
 - NOAA creates the Potomac Basin Drought Monitor for COG once conditions deteriorate– usually when D1 enters the region
 - The Climate Prediction Center creates a number of different drought outlooks – can be viewed here <https://www.cpc.ncep.noaa.gov>
 - **Streamflow/Reservoir Storage Forecasting and Probability-based Triggers**
 - **Presentation by Steve Nebiker, Hydrologics**
 - Forecasting tools need to do more with less, incorporate climate change, environmental concerns, permitting challenges, and manage drought
 - Easy trigger to evaluate is days of supply
 - Systems need to be more dynamic/advanced and evaluate a range of tools
 - Dynamic Reservoir Operations (DRO) utilizes a variety of inputs to manage objectives, inputs like forecasts, demand levels, groundwater levels
 - Worked with ICPRC on forecast/outlook for conditional probability of that Potomac flow will drop below 700-million gallons per day (MGD) at Little Falls through December 31
 - Additional information: <https://www.hydrologics.net>

○ **Groundwater**

- **Presentation by David Nelms, USGS Virginia Water Science Center**
- USGS Groundwater Watch is a regional tool to evaluate groundwater conditions
 - Real time data available in VA/ not in MD
- USGS also has a tool to evaluate streamflow conditions
- Winter streamflows are used to estimate the chance of hydrologic drought during summer months.
- Hydrologic drought streamflow probabilities for July, August, and September are provided as functions of streamflows during the previous October, November, December, January, and February.
- Probable streamflows are identified 5 to 11 months ahead of their occurrence
- Precipitation timing is important
- Additional Information:
<https://groundwaterwatch.usgs.gov/net/ogwnetwork.asp?ncd=crn>

- **Presentation by Jason Groth, Charles County Planning and Growth Management**
 - Water Resources are available from the Surficial ,Aquia Magothy, Upper Patapsco ,Lower Patapsco, and Patuxent Aquifers and WSSC
 - Formed a water resources advisory committee in 2015 to evaluate resources and planning for the county
 - Developed a groundwater monitoring strategy to measure/observe water levels, gather data, establish trends, adjust pumping as needed, and plan for future needs
 - They want to minimize drawdown or the change in water level caused by pumping the groundwater
 - Need to evaluate a number of ways to minimize the drawdown – a few include
 - WSSC Connections (Existing 1.4 MGD and potentially an additional 5.0 MGD)
 - Effluent Re-Use from WWTPs - Power Plants/Industrial Users
 - Well Field Optimization & Automation
 - Additional strategies include supplementing water systems with alternatives to groundwater and a water conservation program
 - Additional Information: <https://www.charlescountymd.gov/pgm>

Reasonable accommodations are provided upon request, including alternative formats of meeting materials.
Visit www.mwco.org/accommodations or call (202) 962-3300 or (202) 962-3213 (TDD).

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