

## Massachusetts Drought Management Task Force – Meeting Notes

June 08, 2023 9:30 a.m. – 11:30 a.m. conducted remotely via Zoom

<b>Attendees, Drought Management Task Force Members:</b>		
Vandana Rao, Chair, Executive Office of Energy and Environmental Affairs (EEA)	Sara Zalieckas, Co-Chair, Massachusetts Emergency Management Agency (MEMA)	Ronald Horwood , National (NWS) Weather Service, Northeast River Forecast Center (NRFCC)
Viki Zoltay, Department Conservation and Recreation (DCR) Office Water Resources (OWR)	Duane LeVangie, Department Environmental Protection (MassDEP), Water Management Act (WMA) until 11:00 then Jen D'Urso	Phil Guerin, Massachusetts Water Works Association (MWWA)
John Scannell, DCR, Division Water Supply Protection	Christina Wu, MassDEP, Wetlands	Gardner Bent, United States Geological Survey (USGS)
Michael Botelho, Massachusetts Department of Agricultural Resources (MDAR) (until 11:11)	Marcos Pareto, Department of Public Utilities (DPU)	Meg Blanchet, Department of Public Health (DPH)
Lexi Dewey, Water Supply Citizens Advisory Committee (WSCAC)	Kate Bentsen, Department of Fish and Game (DFG)	Joe Dellicarpini, NWS Boston
John Gregoire, Massachusetts Water Resources Authority (MWRA)	Karyn Lothrop, DCR Bureau of Forestry and Fire Control	Sarah Bower, Mass Rivers Alliance
<b>Other Attendees:</b>		
Kara Sliwoski, DCR-OWR	Anne Carroll, DCR-OWR	Deanna Marks, NWS Albany
Jason Duff, DCR-OWR	Chris Bruet, USGS	Vanessa Curran, DCR-OWR
Don Cooper Seekonk Water District	Jaclyn Hamel, MEMA	Erin Graham, DCR-OWR
Michael Souza, Agency Meteorologist, MEMA	Eric Hooper, Town of Sharon Water Department	Zeus Smith, Charles River Watershed Association
Jiedine Phanbuh, Summer Fellow with MA Water Resource Commission	Britt Westergard, NWS Albany, NY serving Berkshire County	Sylvia Reeves, National Oceanic Atmospheric administration (NOAA) Northeast Integrated Drought Information System (NIDIS), Northeast Drought Information Coordinator
Sam Banas, USGS	Jason Pollender, USGS	Abe Farley, NOAA
Alan Taubert	Ryan DuVally	Sara Cohen, DCR-OWR
Greg Nuttelman, Easthampton DPW	Stephen Olson, Wellesley Water	Elizabeth LeBlanc
Marlene Ladderbush, Georgetown Water Dept	Kristel Cameron, Abington/Rockland JWW	Steve Gregoire, Southbridge Water Department
Pine duBois, JRWA	Steve Cox, Raybern Consulting	Robert Daley
Elise Tarnauskas, Springfield Water and Sewer Commission	Todd Melanson, Chelmsford Water District	Paul Anderson, Brewster Water Department
Tom Royal, Abington/Rockland JWW	Bill Leatham, NWS Boston	Jonas Kazlauskas

Scott Vesey, Danvers Water Department	Caleb Treacy, Bridgewater Water	Jimmy Powell, Jones River Watershed Association
Jessica Veysey Powell, Nashua River Watershed Association	Clayton Weglarz, Easthampton Water Department	Shavaun Callahan, Chief Water Operator, Town of Salisbury
Bob Worthley, Foxborough Water	Kourtney Allen, Attleboro Water	Greg O'Brien, Attleboro Water
Caitlin Chafee, Town of Concord Water Division	Melissa Simoncini, Town of Concord Water Division	Christian Cunnie, MEMA Public Information Supervisor

**1. Introductions: EEA, MEMA & Announcements**

Rao called the meeting to order at 9:33AM, introduced herself and thanked and welcomed task force members and other attendees. Rao introduced Sara Zalieckas from MEMA as co-chair. Rao announced that the meeting was being recorded for meeting notes and asked those who wished to speak or comment to put their name in the chat. She asked all attendees to put their name and affiliation in the chat for attendance purposes.

**2. Brief Overview of MA Drought Management Plan (MA DMP): OWR Staff**

Zoltay provided an overview of the six MA drought indices, the number of stations that report, the index severity levels, and the drought regions.

**3. Updates on Current Conditions and Impacts from Members of the DMTF**

Those updates with presentations can be found on the mass.gov website.

**Weather & Forecast: Joe Dellicarpini - National Weather Service, Boston/Norton**

May precipitation was below normal in the Berkshires, Cape Cod, and the Islands, and near normal for the rest of the state. The 3- and 6-month departures are mostly near normal. For the first week in June, precipitation is mixed. Beneficial rain is expected through early next week, then there is no clear signal whether Massachusetts trends drier or wetter in late June. Temperatures in May were near normal except in western Massachusetts where they were a little below normal and on Cape Anne, Cape Cod, and the Islands, where they were a little above normal. There is no signal for warmer or cooler temperatures in June, then odds favor above normal temperatures in July and August. There will most likely be an average number of tropical cyclones this year.

**Hydrologic: Gardner Bent - USGS**

A time series of streamflow conditions over the past 45 days was shown. A precipitation event on April 13th improved conditions, and then during May they got drier again. More of the gages started to fall into the below-normal and much below-normal ranges. There was some rain on the May 20th and 21st. At the end of May about half of the gages were in the normal range and half in the below-normal range, and this has continued through today. A graph of the 7-day average streamflow statewide for the past two years was shown. The end of May last year and the end of May this year are almost identical. Maps of monthly average streamflow conditions from March-May were shown. The conditions are mostly normal, except in April there was some drying in south central Massachusetts, the northeast, and southeast.

Bent showed a series graphs of the 7-day average flow of individual gages representing the drought regions. Those streamflows that are below normal are Herring Brook, the Taunton River near Bridgewater, the Quaboag River at West Brimfield, and the Mill River at Northampton. The Housatonic River near Great Barrington in the Western Region, where things have been drier, is in the below-normal to almost much below-normal range. The Quashnet and the Nashua River at Leominster in the Central Region are at the lower end of normal.

Groundwater levels in March were normal. By May some wells were slightly below normal. Bent showed groundwater levels at individual wells representing the Drought Regions. The well in Edgartown on Martha's Vineyard is in the normal range heading to the below-normal range. The well on Nantucket already reached its high and is trending downwards to the below-normal range. Cape Cod is mixed- two wells (Sandwich and Wellfleet) are below normal, and one is normal (Brewster). However, all three wells have already reached their high for the year and are trending downward. The well in Plymouth in the Southeast Region is in the normal range, and likely will be for a while. The well in Norfolk is also in the normal range. The wells in the Northeast Region, Newbury and Acton, look good and are in the normal range. The well in West Brookfield in the Central Region is normal. The wells in Graville in the CTRV Region and Pittsfield in the Western Region were below normal at the end of May, but now are in the normal range because the statistics change by month.

**Hydrologic: Ron Horwood -NERFC (NOAA)**

River flows have deteriorated over the past month across most of the state. The lowest flows are currently occurring across central and western Massachusetts (especially Berkshire County) where they are now below to much below normal. The weather pattern looks fairly active for June with several chances for rainfall over the next 10 days. As a result, the NERFC forecast ensembles are predicting rivers and streams to be close to or higher than current flow levels as we move into the latter half of June.

**Water Supply: Duane LeVangie – MassDEP**

Most WMA permits include requirements to restrict nonessential water use. Triggers for implementing restrictions include streamflow, calendar, groundwater, and drought declarations or 7-day low flow. WMA registrations now include requirements to restrict nonessential uses during declared droughts. Restriction requirements are consistent with the MA Drought Management Plan requirements. Registrants get up to 24 months after issuance of the Registration Statement to begin implementing restrictions. Public Water System (PWS) surface water suppliers with significant storage may develop a system-specific drought management plan. These conditions have been challenged.

WMA staff review and track stream gages and certain wells daily. USGS gages falling below the restriction trigger values increased gradually through most of May but nearly all the gages monitored have fallen below the trigger values since May 30. Seventy-six PWS have implemented restrictions as of May 30th with an additional 13 added since May 30th. Suppliers have 14 days to notify MassDEP of the implementation of restrictions, so more information expected. WMA staff will be reaching out to those PWS who have yet to give notification of the implementation of restrictions.

Guerin asked if the majority of water systems with restrictions in their permits implement based on the calendar and not based on streamflow triggers? LeVangie responded that there is also a third, hybrid approach. If a water supplier chooses the calendar approach, that doesn't mean on May 1st there has to be a restriction through September 30th, but many chose to do that. Suppliers may wait until the first trigger goes off. So whether it's June 1st or May 1st, suppliers implement the restriction and keep it in place for the rest of the year. LeVangie thinks a majority of the suppliers use this hybrid approach. Melanson, Environmental Compliance Manager of the Chelmsford Water District, commented that in talking with other suppliers, they find that communication with the community is easier and less time consuming by using the calendar approach, so that's what they have been doing.

**Water Supply: John Gregoire, MWRA**

Quabbin Reservoir remains within normal operations at nearly 95.8%. The reservoir is following the normal seasonal pattern. Quabbin was spilling last month, but that has ceased. The current metropolitan Boston demand is approximately 200 MGD and the current Chicopee Valley demand is approximately 9 MGD. Quabbin water is being transferred at 300 MGD for seasonal water quality reasons. Flows on the Connecticut River at Montague have fallen below the June 1st permit threshold and 71 MGD is now being released.

Wachusett Reservoir is in the middle of normal operating range. Water is being released from the Wachusett dam (50 MGD) and the Crest Gate spillway (68 MGD) into the Nashua. This is to enhance the Quabbin interflow. After the interflow is fully set up, the crest gate will be closed. Precipitation monitored in the watersheds was well below the long-term average in May. Both the Sudbury and Foss Reservoir, which respond to drought conditions, are in the middle of their normal operating bands.

**Water Supply: Phil Guerin, MWWA**

Guerin reported feedback received from water suppliers in all Regions. Of those reporting, suppliers do not have concerns and did not report impacts. Supplies are normal. Groton reported that water levels are so far okay, but not great and not of major concern yet. May 2023 was their highest May demand in the past 25 years. The break in the weather for the first week of June (cool and rainy) is very much welcome.

**Water Supply: Marcos Pareto, DPU**

Pareto gave an update regarding private water suppliers. Oxford and Sheffield no longer have restrictions. Millbury, Dover, and Plymouth have restrictions.

**Environmental: Christina Wu, MassDEP (Wetlands)**

MassDEP Central Region Office Wetlands staff have reviewed two Notice Of Intent that included recent photos of dried perennial streams (Shrewsbury & Ashburnham). However, both streams have very small watersheds (<0.2 square miles), so it is possible that they were misclassified. While groundwater levels appear to be lower than normal for this time of year, at least in the northern part of CERO, surface water in rivers and ponds throughout the region appears to be at typical levels for June.

**Environmental: Kate Bentsen, DFG**

Bentsen gave an update from Brad Chase at the Division of Marine Fisheries and relating to River Herring: The spring diadromous fish migrations are winding down this time of year and they did get by with generally suitable spring flows despite the developing drought conditions.

**Environmental: Sarah Bower, Mass Rivers Alliance**

No update for this meeting.

**Environmental: Lexi Dewey, WSCAC**

From the observations Dewey made, flows have been lower, but still good.

**Agricultural: Michael Botelho, DAR**

There are no drought-related impacts thus far being reported. even though there hasn't been a lot of precipitation, there is enough moisture in the top layer of soil. However, there are some serious impacts due to the late frost. If the drought is long-lasting, coupled with the early frost impacts, it will be a tough production year in the Northeast.

**Fire Danger: Karyn Lothrop, DCR Fire Control**

This year so far has been extraordinary. The Canadian air during March and April brought low humidities to Massachusetts and caused drying conditions. The 100-hour to 1,000-hour fuels dried out, with fuel moisture numbers below 10%. There have been 874 fires so far this year for a total of 2,979 acres burned. Although that isn't all that unusual, last year there had been 707 fires at this time for a total of 2,616 acres burned, the North Shore is being impacted again. It is unclear exactly what's happening, but the fires are human caused. There have been several large fires happen in State forests, Breakheart Reservation and Blue Hills, in addition to Lynn Woods. The month of May has been very active- there have been 252 fires, which is an increase of 15 from last year, and 871 acres was burned, which is a very large increase of over 200 acres compared to last year. Things

have normalized recently because of green-up and higher humidities; Keetch Byram Drought Index (KBDI) levels are average. KBDI will be increasing with the drying trend starting and especially since the rainfall that was predicted for the Cape and Islands for last weekend didn't happen. The soil below to top few inches is still dry. Regarding air quality, the haze and smoke we've been seeing and smelling in Massachusetts has been from the Quebec wildfires in Canada.

**Engineering/Infrastructure/Forestry: John Scannell, DCR**

There is no impact to infrastructure at this point, and forestry impacts tend to be more drawn out. The director of Forestry, Peter Church, notes that the late frost impacted oak trees and they lost leaves. This is an additional stressor, and the combination of stressors like drought and pests that can ultimately lead to the death of trees.

**Public Health: Meg Blanchet, DPH**

Due to a meeting chair oversight, this report was skipped. Communication after the meeting noted that there are no updates.

**4. Presentation of Index Severity Levels as per MA DMP**

Zoltay gave a recap and overview of drought conditions. April through December of 2022 there was a drought. December was wet, which helped to end the 2022 drought. January was wet, too. Since then there has been variable precipitation across the months and across the State coupled with above-normal temperatures and multiple heat waves. This has led to fluctuating impacts on stream flow and groundwater. Between April and the end of May the US Drought Monitor has shown fluctuating conditions in Massachusetts.

The Standardized Precipitation Index (SPI) has been variable as well. In March precipitation was normal except for the islands and the few scattered spots of slightly below-normal precipitation. In April there were more below-normal areas in the Southeast, Cape, and Islands Regions. In May there were more below-normal and well below-normal stations, especially in the Western, Cape, and Islands Region.

There has been a steady accumulated precipitation deficit in March and April, with some recovery from a storm at the end of April and one in May. Overall, there has been a decline in most Regions, with some closer to normal than others. The 2-mos SPI is Level 1 for the Western, Cape, and Islands Regions, and the Southeast Region is at the low-end of normal.

Streamflow has been highly variable. March conditions were normal. In April almost the whole eastern part of the State was below to well below-normal. In May, some of the gages in the eastern part of the state are still below normal, although not as severe, especially in the northeast. There were some thunderstorms, but generally the numbers are lower. The time series shows the variability and the temporary relief from rainstorms. There were a few record lows in May. The Western Region is at index severity level (ISL) 1, and Cape Cod is at level 2. Other Regions are mostly hovering in the thirties, so still on the drier side, except for the northeast again with the thunderstorm at 45<sup>th</sup> percentile.

Groundwater was variable in March, there were below-normal wells in April, and some improvement in May. There were no groundwater wells that were in a 0 to 2<sup>nd</sup> percentile or in the 2<sup>nd</sup> to the 10<sup>th</sup> percentile range in May. All Regions are a ISL 0. However, there are a few regions like the Western Region, Cape Cod, and the Islands that are in the forties and thirties, things are starting to dry out.

The Crop Moisture Index from the MA DMP used for evapotranspiration (ET) doesn't signal except in very severe conditions. It is showing slightly dry/ favorably moist at the end of May. Looking at the proposed replacement ET index, Evaporative Demand Drought Index (EDDI), the 2-month lookback is elevated across the state. The accumulated Potential Evapotranspiration departure through most of March was zero. A heat wave in April, and another in May combined with leaf out has caused from a quarter to over an inch of water loss.

The Spring Bloom Index Anomaly shows that the Cape Cod and Islands Regions bloomed close to 20 days early, and much of the rest of the state was 15-16 days early. This, along with the higher temperatures, explains the evapotranspiration anomalies.

The KBDI is in the normal range. This index only looks at the top eight inches of soil and gets refreshed with a bit of rain easily. As discussed previously by DCR Fire Control staff, the fire danger concern is the bigger fuels that have dried out.

The only Region elevated for the Lakes & Impoundments Index is Cape Cod where Ashumet Pond is at ISL 2.

Zoltay presented a summary of the indices and drought level recommendations. While a good portion of the state is in the normal range, there are some Regions with indices below normal.

## **5. Discussion of Drought Level Recommendations**

### **Western Region:**

Rao summarized conditions. Both precipitation and streamflow are at Level 1. Groundwater is normal. Groundwater typically does not respond within the first month of a drought but more slowly. Lakes and Impoundments are doing fine. EDDI is at Level 3. KBDI is normal. The recommendation is for Level 1, especially with some of the particularly dry conditions and the streamflow below normal. The USDM has put this area their Level D0, which is similar to the MA DMP Level 1.

Horwood agreed that Level 1 is appropriate looking at the indices, the River Forecast Center data, which is showing the Western Region as the worst part of the State, and USDM at D0. Zoltay agreed with Level 1 considering three indices are elevated. Lakes & Impoundments and groundwater are ok, but they take longer to respond. Guerin expressed concern that the recent weather pattern change and the short-term forecast will affect the drought and the conditions aren't that severe. There will be a drought declaration when it is frequently raining so there will be a messaging problem with the public. Bent commented that current streamflow percentiles are less than 15<sup>th</sup> percentile. Horwood commented that the precipitation forecasts are questionable- the weather pattern favors wet conditions but questioned whether it is a sustained period of moderate to heavy rainfall, or quick, short showers and storms moving through. At this time of year, if conditions are starting off dry and the predicted rain doesn't fall, there is rapid acceleration of deteriorating conditions. Zoltay reminded the DMTF that declaration is for May conditions.

Zalieickas agreed with Level 1 and noted that messaging could say that improvements are anticipated in the next few weeks. Souza commented that the long-range forecast was for 1.5-3" of rain through the end of June and that it was too early for Level 1. He suggested revisiting conditions in two weeks. Cohen commented revisiting in two weeks makes sense. Rao replied that staff looks at data periodically and that she isn't planning to call a DMTF meeting in two weeks. John Gregoire commented that if the Western Region is declared Level 1, there should also be messaging given the forecast. Rao asked for only the DMTF members to vote in the chat.

### **Cape Cod Region:**

Rao summarized conditions. Four out of six indices are elevated, including EDDI, which is at Level 4. There have been drying conditions there for some time, and the USDM has had the area at D0 for several cycles. Rao asked Horwood to reiterate parts of his presentation. Horwood replied that the Cape is primarily groundwater driven, and it has been very dry. The conditions don't warrant a Level 2 yet, even though some of the indices suggest that. Groundwater is still at the low-end of normal but is heading down while consumption will be going up with tourism. Horwood recommended Level 1. Guerin commented the real driver on the Cape is groundwater and that seems to be in still a good range. The monitored pond is only one data point and should be dismissed as an indicator, and certainly not a Level 2. Guerin recommended Level 0 because the weather

patterns are changing. Rao addressed the Lakes and Impoundments comment. Although it is only one data point, there has always been confidence in the data. Streamflow is also low. Souza explained about the storm systems and the Cape and Islands. Typically, in the fall, winter, and early spring, there are more coastal storms with a Nor'easter track, and the Cape and Islands get more precipitation. In the summer, the pattern is often more local showers and thunderstorms, and the Cape and Islands miss the precipitation that rest of the State receives.

#### **Islands Region:**

Rao summarized conditions. The USDM shows as D0, which is MA DMP Level 1. Precipitation is below normal, and groundwater is on the cusp, but doing ok. Streamflow and Lakes & Impoundments don't apply in this Region. EDDI is high, and KBDI is normal. The recommendation is for Level 0, but Rao wanted to hear the thoughts from DMTF members. Horwood replied that there is no doubt that the Islands are in a short-term meteorological drought; precipitation is the worst, and the departures since January are down significantly. The Islands like the Cape are groundwater driven and are different from the rest of the State. drought isn't signaled until the groundwater is down. While there is a meteorological drought on the Islands, it is not visible because of the groundwater, which is not that far into the normal range. If the Islands miss on rainfall in June, the groundwater could start to dip, too. If KBDI were really high, that would be another determining factor, but it isn't. We can wait until the groundwater shows a signal.

#### **Connecticut River Valley, Central, Northeast, and Southeast Regions:**

Rao summarized conditions in the other Regions. Indices are normal, although some are in the 30<sup>th</sup> percentile range. There was no discussion and DMTF members put their recommendations in the chat.

To recap, the recommendation to the Secretary is that CTRV, Central, NE, SE, and Islands all stay at Level 0, Western & Cape Cod move to Level 1.

Western Region: A majority of DMTF members supported Level 1, with one member supporting Level 0. Suggested careful messaging of how the conditions could potentially change within the next few weeks if the forecasted rainfall is received.

Cape Cod Region: A majority DMTF members agreed on Level 1, with one supporting Level 0.

Islands Region: DMTF members agreed on Level 0.

Connecticut River Valley, Central, Northeast, and Southeast Regions: DMTF members agreed on Level 0.

#### **6. Recommendations for Drought Level Response Actions**

There should be messaging since it is the beginning of the growing season; outdoor watering restrictions should be followed. Rao reminded the Task Force of the drought outreach materials developed by staff with input from water suppliers that can be used by all and found on the State's website:

<https://www.mass.gov/info-details/water-resources-toolkit-library-of-outreach-materials>.

#### **7. Next Steps**

Rao will brief Secretary Tepper on the Task Force's recommendation. A press release will come out shortly with the Secretary's declaration.

**Meeting Ended:** The meeting was adjourned at 11:29 a.m.