

Drought Management Task Force  
 July 7, 2016  
 Meeting Minutes

**Attendance:**

Kathy Baskin, EEA	Rob Lowell, DCR
Duane LeVangie, MassDEP	Margaret Van Deusen, CRWA
Thomas Maguire, MassDEP	Marilyn McCrory, DCR
Beth Card, MassDEP	Gardner Bent, USGS
Jennifer Pederson, MWVA	Matt Ely, USGS
Leo P. Roy, DCR	Peter Weiskel, USGS
Michelle Craddock, MA DFG, DER	Todd Richards, MDFW
John Gregoire, MWRA – Waterworks	Adam Kautza, DFW
Erin Graham, DCR – OWR	Gabby Queenan, Mass Rivers Alliance
Trevor Battle, MDAR	Michele Drury, DCR/OWR/WRC
Greg Lane, Aquarion Water Company	Kate Adams, Mass DPH/BEH
Alan Dunham, NWS	Jaclyn Hamel, MEMA
Dave Celino, DCR - Fire	Sophie Alexander, WBUR
Matthew Beaton, EEA	

**Opening Remarks**

- Baskin opened the meeting.
- Commissioner Roy (DCR) stated that the state was proceeding with an abundance of caution, due to the low amounts of rainfall received during the past few months. Massachusetts has a robust drought management plan (DMP). The first step for drought response outlined in the plan is calling a meeting of the Drought Management Task Force. Roy then acknowledged DCR’s Office of Water Resources’ efforts to gather the data needed to make a good decision concerning the drought levels.
- Hamel (MEMA) announced that Peter Judge would be retiring from MEMA soon.

Minutes from 6/17/15 were adopted.

**Updates on current conditions and impacts from Members of the Task Force:**

**DCR**

Yeo acknowledged that Baskin was leaving EEA soon.

- The [DMP](#) was updated in 2013 and contains a series of criteria to evaluate conditions
- There are six (6) drought regions. (MWRA has its own DMP, through DEP, that governs MWRA towns.) There can often be different hydrologic conditions within a single region.

- There are two precipitation indices, percent normal and SPI, in addition to months below normal streamflow, months below normal groundwater, reservoir levels, crop moisture index, and fire danger.
- The levels of drought outlined in the [DMP](#) are Normal, Advisory, Watch, Warning, and Emergency.

Carroll gave a presentation (<http://www.mass.gov/eea/docs/eea/wrc/7-7-2016-dmtf-summary.pdf>) on the current conditions with respect to the criteria (indices). In order to develop a drought recommendation, current conditions are compared to the normal calculated using the entire Period of Record (POR).

- There are two (2) precipitation indices, which are based on severity and duration. The Standard Precipitation Index (SPI) is based on standard deviations from normal for 3-, 6-, and 12-months duration and the Precipitation Index is based on Percent of Normal evaluated for cumulative monthly intervals, using 65% below normal as the cut off. DCR and NWS have a robust network of rainfall observers, but not ALL stations are used for the precipitation estimates. The SPI is tripping into the Advisory range for three of six regions. The Precipitation Per Cent of Normal is tripping into the Advisory range for the Cape & Islands region and into Watch level in the Central, Connecticut Valley and Northeast regions. Overall precipitation has been significantly below normal everywhere.
- Reservoirs are classified according to size ([DMP](#)). Standard deviations are calculated for each reservoir. Currently, 20 reservoirs are monitored across the state, but we hope to expand this number. Most reservoirs are still in the normal range, but some in the Central region are significantly below normal – Southbridge and Worcester (both medium-sized reservoirs) are tripping into the Watch level. In the Northeast Region, medium reservoirs are in the Watch level. In the Southeast Region, Milford and Taunton (Assawompsett Pond) are tripping into Watch. Assawompsett is just above normal, but because it was so close it was placed into the Watch category.
- Streamflow is evaluated based on consecutive months below normal. This morning, there were 17 gages at record lows for (all July 7<sup>th</sup> of the POR). The Cape and Islands Regions is based on ground water levels so the stream flow metric doesn't apply. Maguire suggested that the DMTF institute stream flow drought triggers for the Cape. Streamflow indices are tripping to Advisory levels in the Connecticut River Valley and Western Regions and to watch levels in the Central and Northeast Regions.
- The groundwater Index is based on three consecutive months below normal for the Advisory level, or 4-5 consecutive months below normal for the Watch level. The long term data for many observation wells were down at the end of June (except on the Cape). Because the overall June monthly data was not available yet except for the Southeast region, we assumed that if the observation wells were below normal in April and May, they continued to be so in June. The June monthly data for the Southeast region confirmed this. The Western Region has tripped into the watch level; the Connecticut Valley, Central, Northeast and Southeastern Regions have tripped into the advisory level.

- (Hutchins is patched in)
- The Cape & Islands Region is normal for groundwater levels.
- Fire danger is estimated through the Keech Byram Index (KBI). Celino stated the entire state is above 200. All regions are at the Advisory level except the Central Region, which is at the Watch level. He added that there could be drought conditions, but low fire danger because of humidity and green out conditions, but this year it is a lot drier. There have been 56 wildfires so far this season because fine fuels are dry.
- Crop moisture: The crop moisture index (CMI) is at lowest category, except in the Western Region. Battle reported that most farmers are doing ok across state but are relying more heavily on irrigation much earlier in the season than usual. Battle further clarified in a follow-up email that operations with adequate irrigation systems have been getting by but are spending a lot of time and resources keeping their fields properly irrigated. However, those operations without adequate irrigation measures have been noticing drought related impacts to their crops.
- The crop moisture index (CMI) is at lowest category, except in the Western Region.

Summary of DCR's preliminary recommendation for drought stages, based on the majority of the indices tripped:

- Connecticut Valley, Northeast and Southeast Regions: Advisory Level
- Central Region: Watch Level
- Western and Cape & Islands Regions: Normal

There will be more discussion after presentations from other agencies to further refine this recommendation.

(Lane arrives)

### **National Weather Service (NWS)**

- Dunham stated that June's rainfall was less than half of normal. Worcester has had three straight months of below normal rainfall. Rainfall in the area is 1.5 – 2.5 inches down each month since April. The June precipitation departure from normal was 1.5 to 4.5 inches below normal for all of Massachusetts and extending into Connecticut and Rhode Island. The last five-day precipitation index showed a heavy rain band in Southeast Massachusetts. Nantucket received four inches of rain in less than an hour and experienced unusual flooding. So in terms of precipitation, the Cape & Islands Region is ok, but north of the Mass Pike did not get a lot of precipitation from this storm.
- Secretary Beaton & press representative arrive
- Temperatures are above normal, but dew points are below normal (which is why there is high fire danger). Above normal temperatures are forecast to continue.
- The short-term precipitation forecast: some rainfall is predicted between now and July 13<sup>th</sup>, about 0.75 to 1.5 inches. The thunderstorms and heavy downpours forecasted will result in

runoff, but there will not be a lot of soaking into the ground. This will help in the short term, but will not alleviate the drought. A long-term, slow, steady type of rain is needed.

- The 8-14 day forecast is for temperatures to be above normal, with an equal chance of above or below normal precipitation. The same is predicted for the month of July and the rest of the summer.
- The Drought Monitor shows a good portion of the state as D1 (moderate drought), but this morning, the new map shows Essex, Middlesex and Central Worcester counties were elevated to D2 (severe drought).
- Palmer Drought Index: Almost all of MA except for SE and outer Essex County is listed as moderate drought. This index lags behind others. It takes a long time to get into a drought and a long time to get out.
- Crop Moisture Index: the NWS doesn't think the CMI is representative and thinks conditions are drier than what is indicated.
- The monthly drought outlook for July shows no improvement; neither does the three-month outlook (but maybe not getting any worse).

#### **DEP and Water Suppliers**

- Card and LeVangie stated that DEP is starting to evaluate which restrictions are being implemented and which should be. This process started in May, due to the dry conditions. In addition, they are evaluating the types of technical assistance DEP can provide. The process started in May, due to the dry conditions. This evaluation is based on permit requirements to implement water use restrictions (not necessarily based on drought). Most public water supply (PWS) systems have been pro-active and are doing ok. DEP is also following up with those that should have done restrictions and have not (there are only about five PWS in this category).
- Pederson (MWWA) pointed out that some PWS are being pro-active. Worcester is reporting the lowest reservoir levels entering June since 1966, so they are really trying to get the word out. PWS are having trouble getting customers to take restrictions seriously, so a declaration of drought advisory can help. It would be helpful if any drought declaration reflected the importance of conserving water. Yeo stated that the purpose of having Advisory and Watch declaration is to intensify interactions between the state and public to reduce/meet demand. Carroll said the DMP has response actions. Pederson stated that environmental organizations can help get the word out.
- Gregoire said that the MWRA system was generally resilient and was in good shape. Wachusett Reservoir is at 90% full because of transfers from the Quabbin, and Quabbin is at 89%, which is the lower end of the normal band. MWRA communities are ok, except some of the partially supplied communities may need restrictions.

#### **USGS**

- Bent pulled up some "real time" maps, which reflect current conditions compared to the POR (this day compared to this day in history). Streamflows are low compared to the historical

record for July 7<sup>th</sup> (except for groundwater driven systems). It is unusual for things to be this dry this early in the season. Usually these conditions aren't seen until September and October.

- An animation map was presented showing the Northeastern US getting progressively drier over the past 28 days. The Northeast was generally less than the 10<sup>th</sup> percentile for streamflow.
- Groundwater Watch shows the Northeast in through the Central regions as low. The Western MA monthly readings haven't come in yet, although the real-time levels are low. The Wakefield and Wilmington wells are low. Although some wells may be considered in the "normal" range, if current conditions continue, they will be below normal later in the season

## Environment

- Maguire (DEP Wetlands) has not received any calls from Conservation Commissions and consultants concerning perennial stream status.
- Richards (DFG) stated that streamflows are considerably low and are getting drier. He suggested that the perennial vs. intermittent stream definition within the Rivers Protection Act regulations be revisited and that perhaps there could be a definition of a stream drought using a subset of the indicators. Maguire said the existing drought indices are especially problematic for the headwater streams. Baskin suggested that this discussion be handled by a subcommittee. This would need an amendment to the DMP.
- Craddock (DER) stated that DER's network of gages in smaller headwater streams are all showing declines since mid-April, with a steep drop-off in the last month.
- Battle (DAR) stated that farmers have been irrigating since May. It is highly unusual to be irrigating this early. Operations with adequate irrigation systems have been getting by, but are spending a lot of time and resources keeping their fields properly irrigated. However, those operations without adequate irrigation measures have been noticing drought-related impacts to their crops. Baskin asked about cranberries. This has not been a problem because drought conditions in the southeast were not as severe as in the rest of the state.
- Celino reiterated what he had said earlier. He added that fuel moisture is at a record low. This is driving large multiday wildfire events. Advisories will be put out through DCR in coordination with State Fire Marshall's office.
- Lowell (DCR Engineering) reported on DCR's dams in the Charles River and Mystic River basins. The Charles River Dam is at 65% of its operating level; the Amelia Earhart Dam in the Mystic River basin is at 45% of its operating level. Statewide, there is anecdotal evidence that levels at dams are at the low level of operating ranges. The Office of Dam Safety suggests that now is a good time for maintenance.
- Adams (DPH) is concerned about fire danger causing pollution, which can result in problems associated with respiratory issues, anxiety and other health problems. A pollution alert was recently declared because of the ozone levels. Dry air favors the production of ozone. It also leads to more particulates in the air, which have health effects. Private wells are getting lower which could lead to changes in water quality (for example, potential increases in arsenic and uranium levels).

## **Discussion of Drought Indices**

The preliminary recommendations are:

Advisory – Connecticut Valley, Northeast and Southeast Regions

Watch – Central Region

Normal – Cape & Islands and Western Regions

The [DMP](#) outlines the actions that should be taken at each level.

Responding to a question from earlier in the meeting, Baskin gave an overview of the response actions from the Drought Management Plan under a Drought Advisory and a Drought Watch.

There was question about the 211 system. According to MEMA, it is unclear if the system has state-wide capability. Follow-up is needed to determine feasibility and logistics.

LeVangie answered the question about drought designation and permits. Existing permit language includes more stringent requirements under an Advisory level, although the new Water Management Act permits no longer use a drought designation. A 7-day low flow streamflow value is used instead, which was found to be more responsive.

There was discussion on the preliminary recommendations. The hydrological conditions in the Central and Northeast Regions are similar; NWS thinks the CMI is worse than indicated. The Drought Monitor lists the Northeast and Central Regions as D2. NWS stated that Northeastern Region should be at the Watch level. DCR Fire Control and DFG agreed. The group agreed that Connecticut and Southeast are at Advisory level. There was some discussion about groundwater levels in the West. Maguire suggested in the absence of monitoring wells, looking at moisture levels measured by NASA satellites.

Secretary Beaton suggested giving tangible examples to reach the public regarding the drought designations.

There are three subgroups that should be formed to address:

- Expanding the group of reservoirs monitored
- Definition of a hydrological drought for purposes of RPA
- Precipitation Indices

## **Final Recommendation to the Secretary**

Advisory – Connecticut Valley and Southeast Regions

Watch – Central and Northeast Region

Normal – Cape & Islands and Western Regions

The DMTF will meet next month and every month until the drought is over. The August meeting will be scheduled for 8/11/16.