

Health and Environment Committee Hearing

Wednesday, September 28, 2016 3:30pm

Sullivan Chamber

Call of the meeting: The Health and Environment Committee will conduct a public hearing to discuss the ongoing drought and the impact on the Cambridge water supply, what restrictions on water use may be appropriate to consider and what public outreach is needed on water conservation measures.

Updates from City Staff

- City Manager Rich Rossi and Deputy City Manager Lisa Peterson
- Sam Corda, Managing Director, Water Department
- Owen O’Riordan, Commissioner of Public Works
- Claude Jacob, Public Health Officer

Public Comment

Discussion

Adjournment



THE DROUGHT AND ITS IMPACT ON THE CAMBRIDGE WATER SYSTEM

HEALTH AND ENVIRONMENT COMMITTEE HEARING

CAMBRIDGE CITY COUNCIL

SEPTEMBER 28, 2016



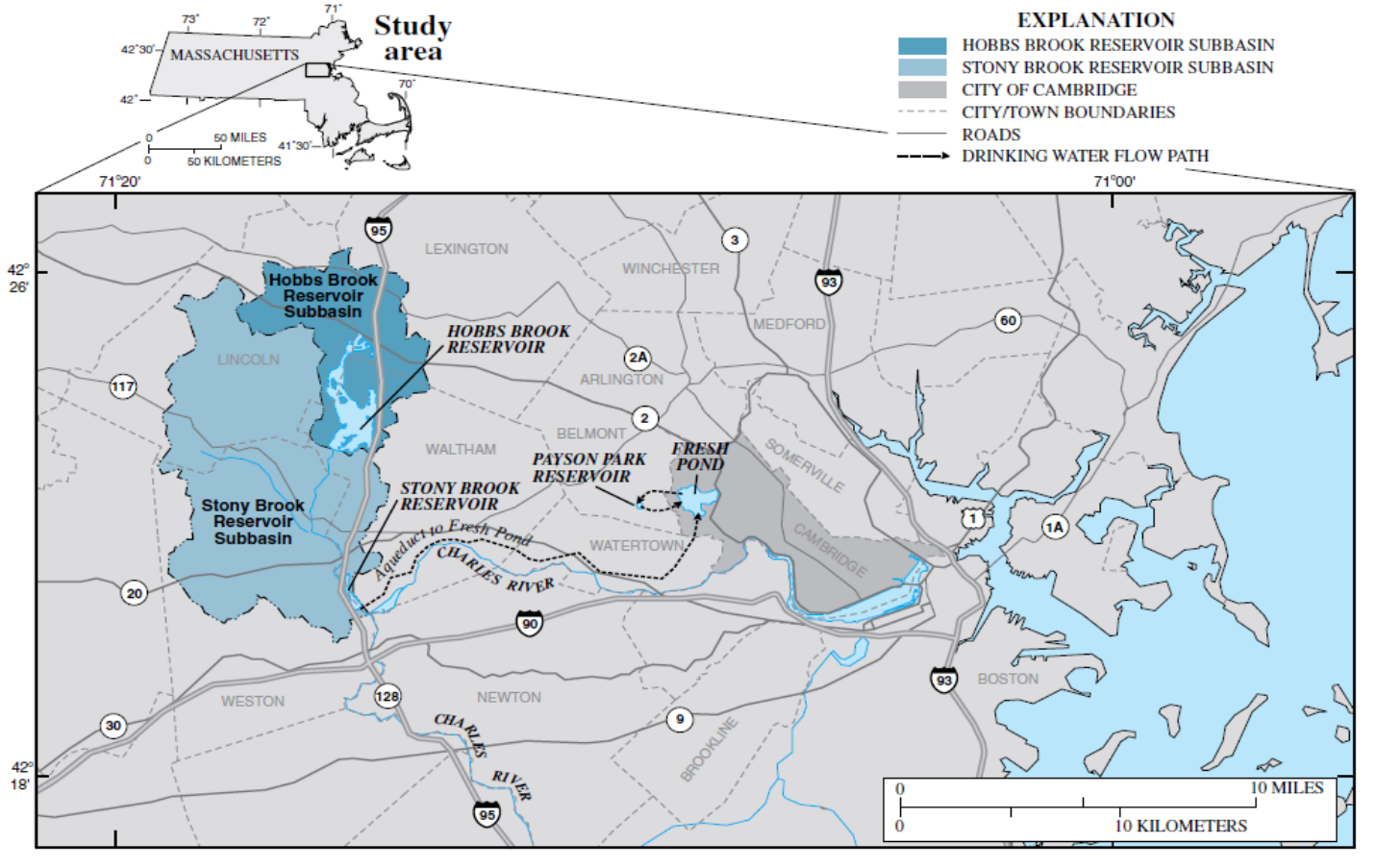


AGENDA

- CAMBRIDGE WATER SYSTEM
- DROUGHT
 - STATUS
 - TRACKING
- WATER CONSERVATION
- WATER SYSTEM STATUS
- GO FORWARD STRATEGY



CAMBRIDGE WATER SYSTEM





CAMBRIDGE WATER SYSTEM (CONT.)

- RESERVOIR SYSTEM CAPACITY WHEN FULL IS 8 MONTHS (WITHOUT ANY PRECIPITATION)
 - BENEFICIAL ASPECTS
 - CAN FILL QUICKER THAN OTHER SYSTEMS
 - CAN READILY WITHSTAND SHORT TERM PRECIPITATION VARIATIONS (+/- 1 YEAR)
 - CHALLENGING ASPECTS
 - CANNOT WITHSTAND LONG TERM DROUGHTS (+/- 2 YEARS OR MORE)
 - NOT A LOT OF WARNING FOR PROBLEM CONDITIONS/SHORT PLANNING HORIZON
 - RESERVOIR SYSTEM ANNUAL RECHARGE CYCLE STARTS IN SEPTEMBER

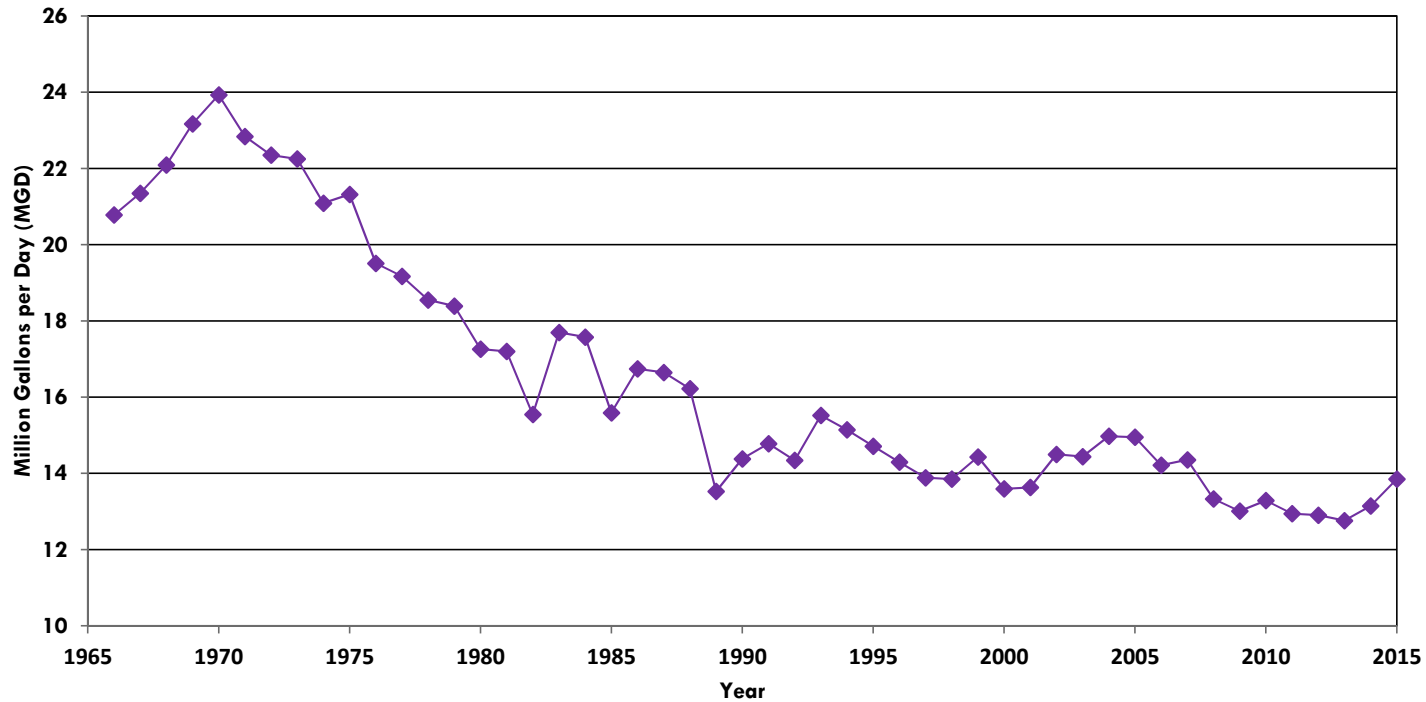


CAMBRIDGE WATER SYSTEM (CONT.)



- OUR AVERAGE DAILY WATER DEMAND HAS STEADILY DECLINED SINCE THE EARLY 70'S

Average Daily Water Consumption in MGD (1966 - 2015)



CAMBRIDGE WATER SYSTEM (CONT.)



- OUR RESIDENTIAL GALLON PER CAPITA PER DAY (RGPCD) USE IS SIGNIFICANTLY BELOW THE STATE GOAL OF 65
- OUR UNACCOUNTED FOR WATER (UAW) IS ALSO LISTED FOR THE SAME TIME PERIOD AND IS ABOVE THE STATE GOAL OF 10%

CAMBRIDGE 6 YEAR RECORD

- 2010: 51 RGPCD; 13.3% UAW
- 2011: 48 RGPCD; 14.3% UAW
- 2012: 48 RGPCD; 16.7% UAW
- 2013: 52 RGPCD; 13.3% UAW
- 2014: 46 RGPCD; 12.4% UAW
- 2015: 49 RGPCD; 12.2% UAW





CAMBRIDGE WATER SYSTEM (CONT.)

- FULL MEMBER OF MASSACHUSETTS WATER RESOURCES AUTHORITY (MWRA)
 - PERMANENT CONNECTION TO MWRA WATER SYSTEM
 - FOLLOW MWRA DROUGHT MANAGEMENT PLAN VS. STATE PLAN
 - ACCESS TO WATER IS READILY AVAILABLE
 - USED MWRA WATER EARLIER THIS YEAR (2016)
 - PRACTICED ACTIVATION AND SHORT TERM USE IN 2015
 - USED MWRA WATER IN 2014
 - MWRA WATER COST IS ~2.0 X OUR COST

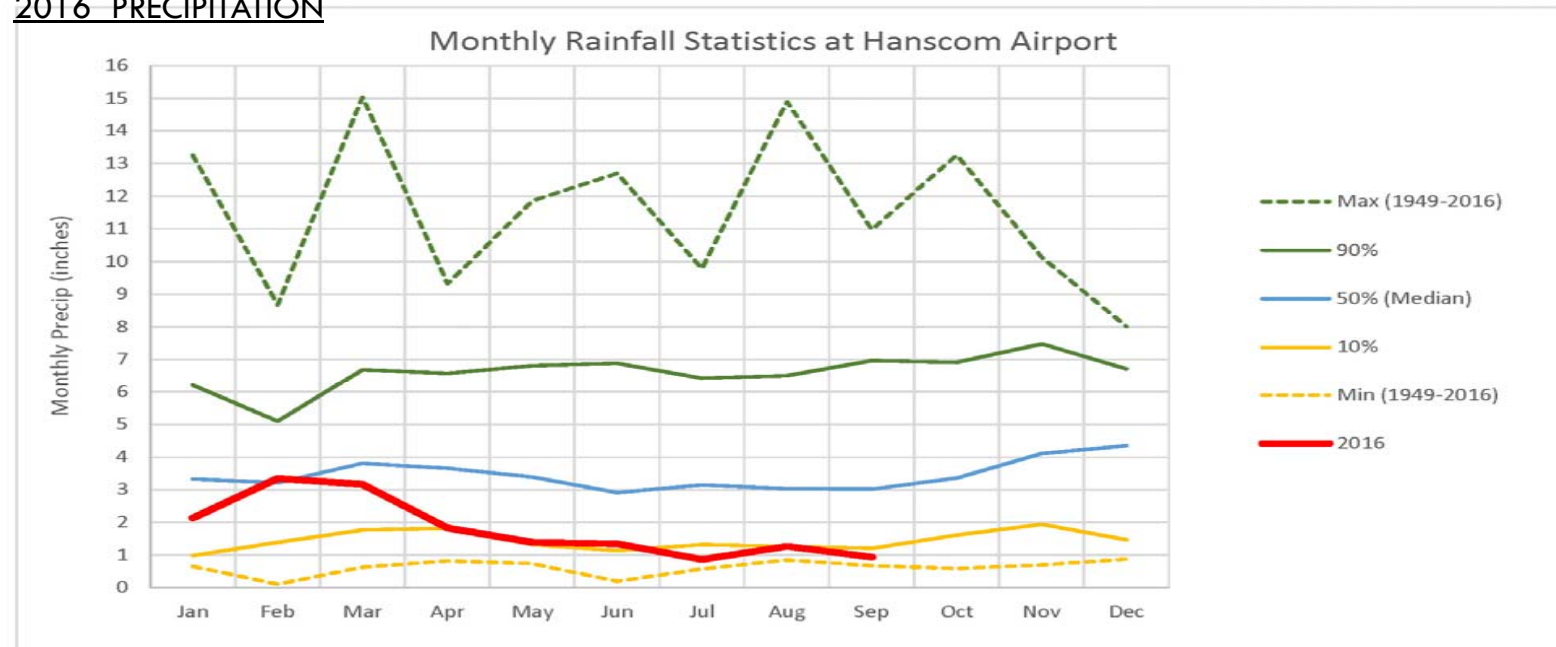


DROUGHT - STATUS



- MAY, JUNE, JULY AND AUGUST 2016 RECORD LOW PRECIPITATION
- SEPTEMBER IS CONTINUING RECORD LOW PRECIPITATION TREND
- NOAA WEATHER PREDICTION IS FOR DROUGHT TO CONTINUE WITH NO ABOVE AVERAGE PRECIPITATION UNTIL SUMMER/FALL 2017
- WOULD NEED 9-12 INCHES OF RAIN OVER THE NEXT 4 WEEKS TO GET US BACK TO RETURN TO “NORMAL” CONDITIONS

2016 PRECIPITATION





DROUGHT - TRACKING

- JANUARY 2016 RESERVOIR SYSTEM ~400 MG BELOW FULL CAPACITY
 - FOCUSED MONTHLY REVIEW
- SOMEWHAT AVERAGE PRECIPITATION THROUGH APRIL
- ENTERED RECORD LOW PRECIPITATION PERIOD IN MAY
- JULY: INITIATED DETAILED WEEKLY REVIEW/DROUGHT CONTINUING
- SEPTEMBER: SERIOUS SITUATION/DROUGHT CONTINUING
 - SYSTEM RECHARGE NOT INITIATED
 - LIKELY ENTERING YEAR 2 OF DROUGHT



WATER CONSERVATION



- AUGUST: STRONGLY ENCOURAGED WATER CONSERVATION – WATER DEPARTMENT WEBPAGE
- SEPTEMBER:
 - URGED OUTDOOR AND INDOOR WATER CONSERVATION – UPDATED WATER DEPARTMENT WEBPAGE
 - REDUCING MUNICIPAL OUTDOOR IRRIGATION BY 50% OR MORE WHERE POSSIBLE AND LOOKING TO TURN OFF IRRIGATION SYSTEMS EARLY
 - URGING WATER CONSERVATION THROUGH ALL CITY SOCIAL MEDIA ACCOUNTS
 - POSTED DROUGHT AND WATER CONSERVATION LINK TO CITY WEBPAGE
 - ADDED WATER CONSERVATION NOTE TO WATER BILLS
 - INITIATED UPDATING WEBPAGE DROUGHT INFORMATION WEEKLY

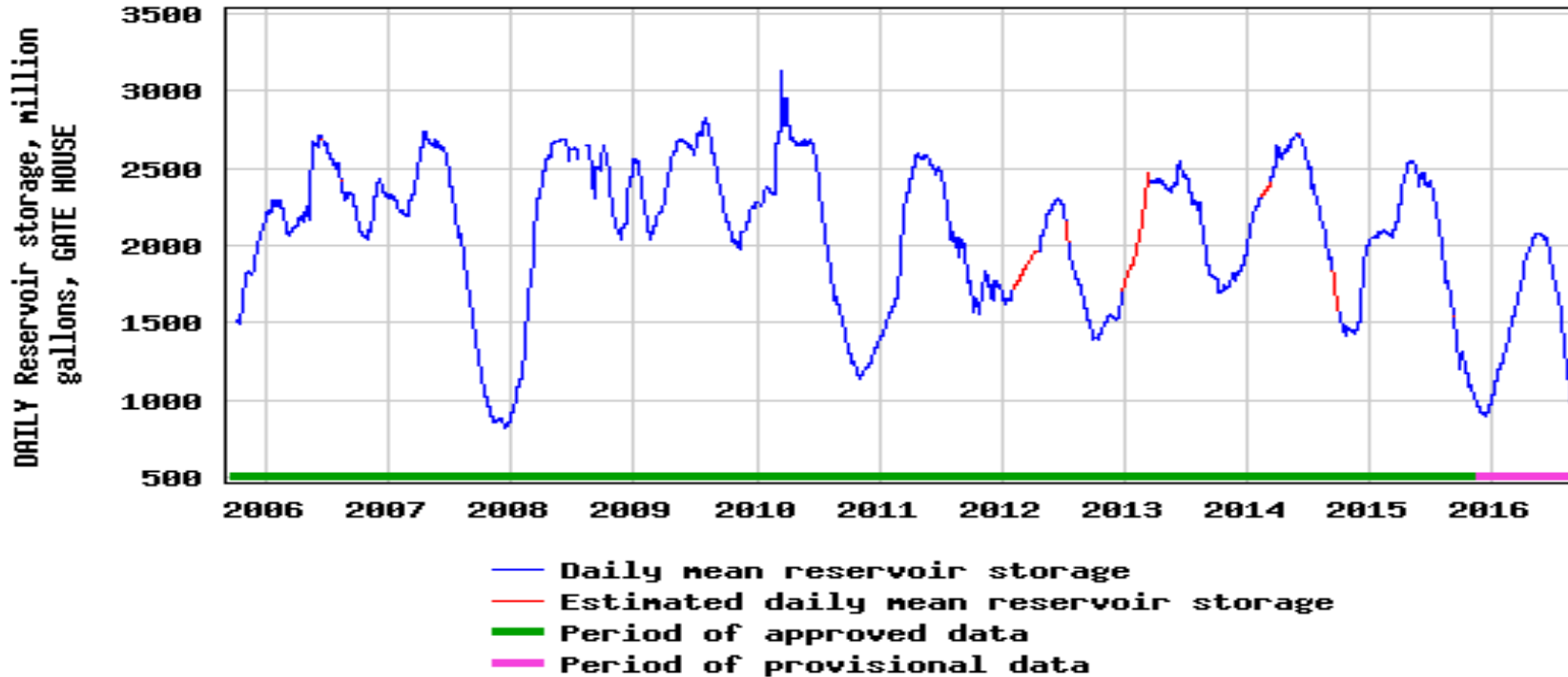


WATER SYSTEM STATUS

RESERVOIR CAPACITY BEYOND 10 YEAR LOW A/O SEPTEMBER 26, 2016



USGS 01104430 HOBBS BK BELOW CAMBRIDGE RES NR KENDALL GREEN, MA





WATER SYSTEM STATUS (CONT.)

- ABOUT 35-40 DAYS OF USEABLE CAPACITY REMAINING IF SEVERITY OF DROUGHT CONTINUES
- AS A RESULT OF THE CONTINUED DROUGHT THROUGH SEPTEMBER AND NO WEATHER PATTERN CHANGE FORECASTED, WE WILL BE DECIDING HOW MUCH MWRA WATER WE WILL NEED TO SUPPLEMENT OUR WATER. THIS WILL BE BASED ON OUR COMPREHENSIVE EVALUATION, ANALYSIS AND DISCUSSIONS
- THIS WILL HAVE A SIGNIFICANT COST IMPACT TO THE WATER DEPARTMENT BUDGET



GO FORWARD STRATEGY



- CONTINUE AND EXPAND CONSERVATION PROGRAM
 - STRATEGIZE WITH TOP WATER USERS
 - UNIVERSITIES, PUBLIC SCHOOLS, MUNICIPAL FACILITIES, BUSINESSES AND CITIZENS
 - CITY WEB PAGES, SOCIAL MEDIA, WATER AND SEWER BILLS, FLYERS, NOTICES, ETC.
 - DEVELOP OUTDOOR WATER USE RESTRICTION PLAN TO TAKE EFFECT BEFORE THE SPRING WATERING SEASON (2017)
- CONTINUE DETAILED WEEKLY OPERATIONAL REVIEW
 - MINIMIZE MWRA WATER USE, MAINTAIN RESERVOIR SYSTEM AND PLANT OPERATIONAL STATUS
- COMPREHENSIVE FINANCIAL ANALYSIS UNDERWAY
 - MWRA COST
 - REVENUE LOSSES
 - RATE IMPACT
- MONTHLY STATUS UPDATES
 - CITY MANAGERS OFFICE, CITY COUNCIL, CITY STAFF AND THE GENERAL PUBLIC





Cambridge
Public Health
Department

TO: Richard C. Rossi, City Manager
FROM: Claude-Alix Jacob, Chief Public Health Officer
DATE: September 28, 2016
SUBJECT: Potential Impacts of Drought on Community Health

The historic drought experienced by the Northeast this year has raised valuable questions about the impact of extended periods of drought on individual health and community health. While Cambridge benefits from a very reliable source of drinking water (Hobbs Brook Reservoir) and retains the option of switching to MWRA water from the Quabbin Reservoir, there further potential impacts that should be considered. Some are regional in nature and not mitigated by our dependable access to high quality drinking water.

- **Dehydration.** Greater likelihood that residents will get and stay dehydrated over an extended period of time. This introduces a variety of health vulnerabilities for everyone, but can be more severe for individuals on certain medications and those who suffer from circulatory or metabolic disease.
- **Heat Effects.** As drought often coincides with periods of higher heat the combined impact of heat and dehydration should be taken in account.
- **Playing Surfaces.** Injuries may occur from playing on bare or hardened playing surfaces.
- **Air Quality.** Dust/air quality is negatively impacted as particulates are more likely to remain airborne within the breathing zone. This could amplify the impact of landscaping equipment like lawn mowers and leaf blowers if the topsoil is desiccated. Dry air increases the ability of dust and pollen and many gaseous pollutants to remain in the air column and therefore available for inhalation. Individuals with respiratory illnesses are most vulnerable.
- **Cooling Systems.** In **severe** drought conditions, there may be restrictions on the use of central water-cooled HVAC systems in some cities. This might limit the extent of cooling allowed.
- **Trees.** Trees may become weak and brittle and are more vulnerable to coming down in storms. This may pose a physical hazard to residents and power lines, but also may impact the cooling provided by the urban canopy.
- **Vector Distribution.** Potential changes to vector distribution and vector borne disease. This can be a complex relationship, as some localized breeding habitats may be negatively impacted by drought (still or standing water) other areas may become more likely to support breeding of mosquito larvae. The heat often



associated with drought is likely to accelerate reproductive cycles of mosquitoes known to be vectors of zoonotic disease.

- **Food Supply.** Potential impacts on food supply chain, availability of local produce, and disease transmission. Water shortages could result in farmers using recycled water to irrigate fields, which may lead to contamination of crops. In this regard, food may serve as a vehicle of transmission for diseases such as *E. Coli* and *Salmonella*. In addition, the drought may directly impact crop yield, reducing healthy food availability. The MA Executive Office of Energy and Environmental Affairs (EOEEA) just released an announcement that farms in 14 MA counties, including Middlesex county, may be eligible for natural disaster relief for loss of crop production. This is a reminder the regional drought can impact our food supply in the near term. Severe drought in other parts of the US may have an even greater impact of our food supply.
- **Recreational Water.** Low water levels in recreational water bodies can lead to warmer temperatures that drive overgrowth of bacteria and other organisms, such as cyanobacteria. As a result, water-related recreational activities (e.g., swimming, fishing, boating) during the drought may lead to increased risk of waterborne disease, and may impact both people and their pets. In Cambridge we have a current advisory for a harmful algal bloom (cyanobacteria) in the lower Charles River Basin from the BU bridge to the Museum of Science due to test results above the state guidelines. Such algal blooms may be worsened by chronic drought conditions elevated temperatures.
- **Mental and Behavioral Health.** Extended drought conditions may have an adverse financial impact on workers in the agricultural industry and related industries, such as nurseries and landscape work. Financial stress can lead to depression and anxiety and can exacerbate pre-existing mental conditions.

Overall we need to consider a long period of drought and/or elevated temperatures to be a significant health stressor in general, but pay special consideration to those at greater risk of dehydration or heat-related health risk.

For a more global assessment of the impact of drought on public health, see attached materials.

Cc:

Cambridge City Manager
Cambridge Community Development
Cambridge Fire Department
Cambridge Water Department