

AGENDA

1. Introductions & Drought Response Update: EOEEA, MEMA

2. Updates on Current Conditions and Impacts—DMTF member reports

- Hydrologic: DCR, USGS, NOAA-RFC
- Weather: NOAA-NWS
- Water Supply: DEP, MWRA, MWWA, DPU
- Environmental: DEP, DFG, MRA
- Agricultural: DAR
- Fire Danger: DCR
- Engineering/Infrastructure: DCR
- Public Health: DPH

3. Discussion

4. Recommendation



Hydrologic Conditions in Massachusetts

Drought Management Task Force

Anne Carroll and Viki Zoltay
DCR Office of Water Resources

September 3, 2020

Meeting Co-Chairs: EOEEA, MEMA



MA Drought Indices



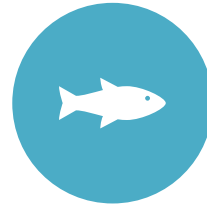
Precipitation (57)



Streamflow (59)



Groundwater (63)



Lakes and
Impoundments (16)



KBDI - Fire Danger
(16)



Crop Moisture
(national map)

Numbers in parentheses indicate number
of data points across the state

MA Drought Management Plan

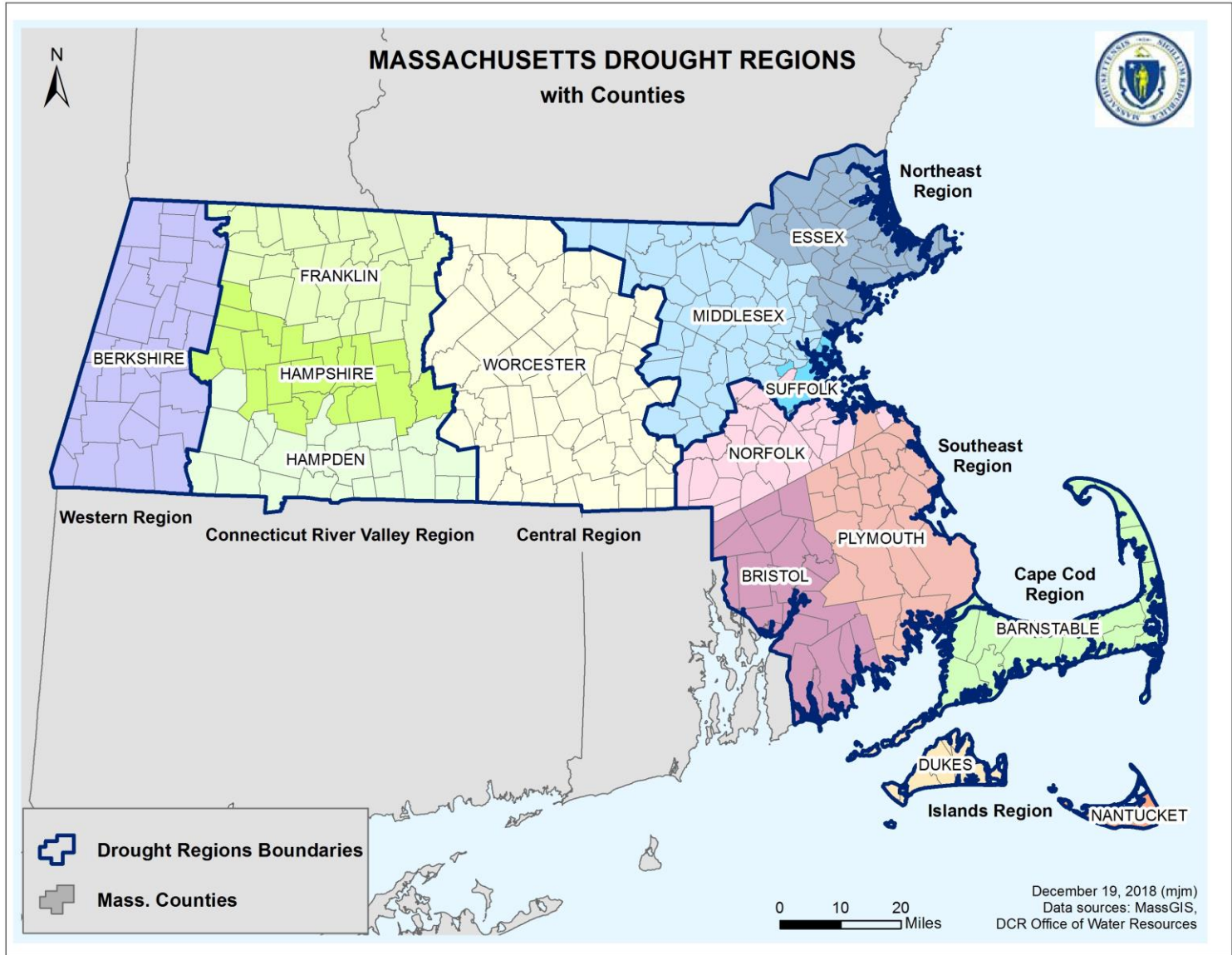
Drought Levels

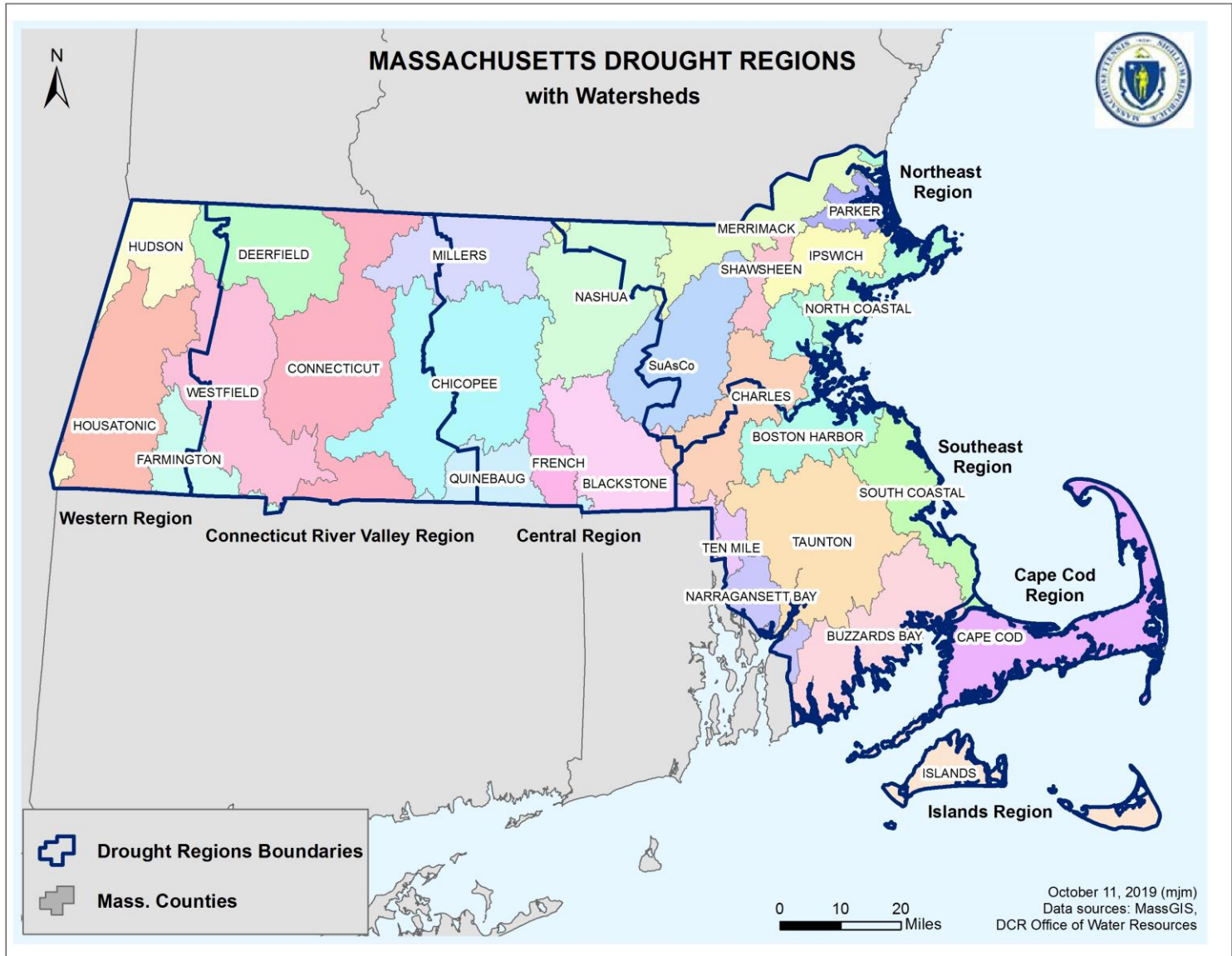


MA Drought Management Plan

Drought Indices

| Index Severity Level | Percentiles for: Precipitation, Streamflow, Lakes and Impoundments and Groundwater | Keetch- Byram Drought Index | Crop Moisture Index |
|----------------------|--|--------------------------------|------------------------|
| 0 | >30 th percentile | < 200 | > -1.0 |
| 1 | ≤30 and >20 | 200-400 | ≤-1.0 and > -2.0 |
| 2 | ≤20 and >10 | 400-600 | ≤-2.0 and < -3.0 |
| 3 | ≤10 and >2 | 600-700 | ≤ -3.0 and > -4.0 |
| 4 | ≤2 | 700-800 | ≤-4.0 |





Task Force Member Updates



Hydrologic
Conditions



Weather &
Forecast



Water Supply
Impacts



Environmental
Impacts



Agricultural
Impacts



Fire Danger

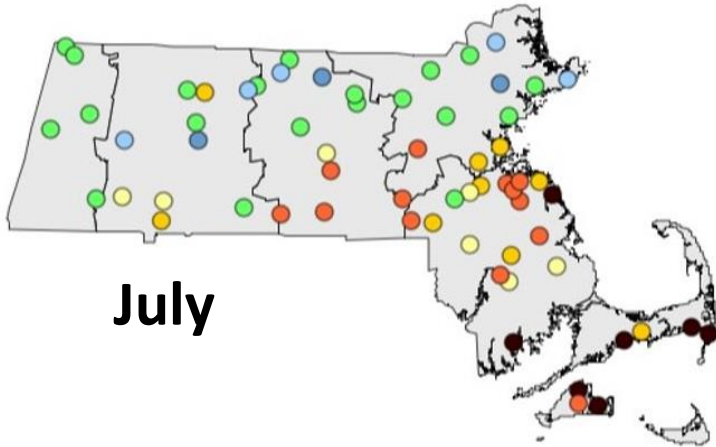


Engineering/
Infrastructure
Impacts

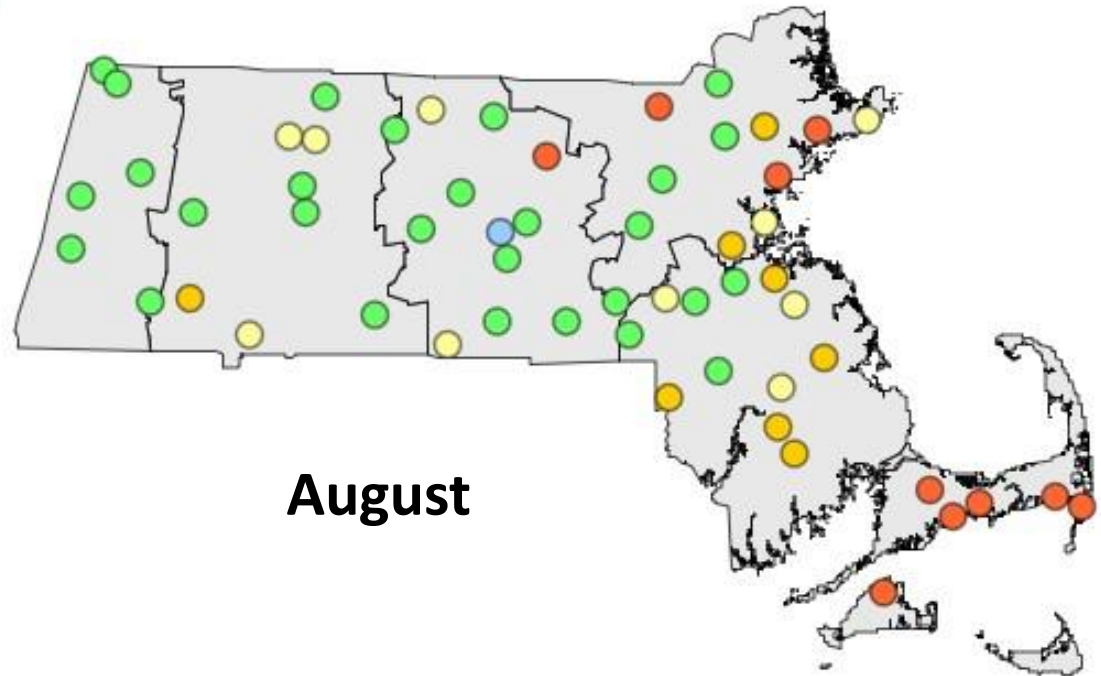


Public Health
Impacts

Precipitation – SPI

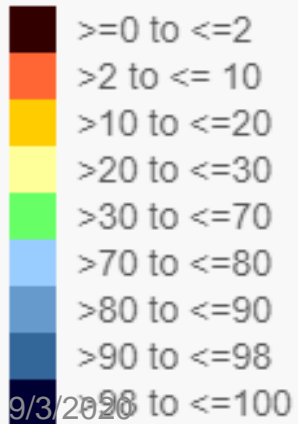


July



August

Percentiles



9/3/2026

Precipitation Index – SPI

August

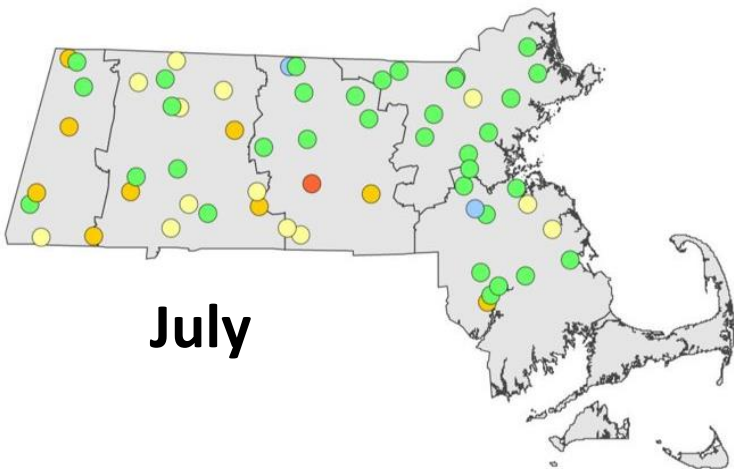
| Region | Total Reporting for August | SPI 1* | SPI 2 | SPI 3 | SPI 6 | SPI 12 | DMP Index Severity |
|-----------------|----------------------------|--------|-------|-------|-------|--------|--------------------|
| Western | 6 | -0.08 | -0.35 | -0.74 | -0.66 | -0.07 | 1 |
| CT River Valley | 9 | -0.40 | -0.30 | -1.03 | -0.99 | -0.63 | 2 |
| Central | 13 | -0.21 | -0.49 | -0.82 | -0.40 | -0.25 | 1 |
| Northeast | 11 | -0.32 | -0.79 | -0.76 | -0.64 | -0.44 | 1 |
| Southeast | 12 | -0.35 | -1.02 | -0.49 | 0.11 | -0.01 | 2 |
| Cape Cod | 5 | -1.33 | -2.14 | -2.34 | -1.35 | -0.15 | 4 |
| Islands | 1 | -1.59 | -1.70 | -1.70 | -0.36 | 0.14 | 3 |

*1-month SPI is for informational purposes only, not for drought determination

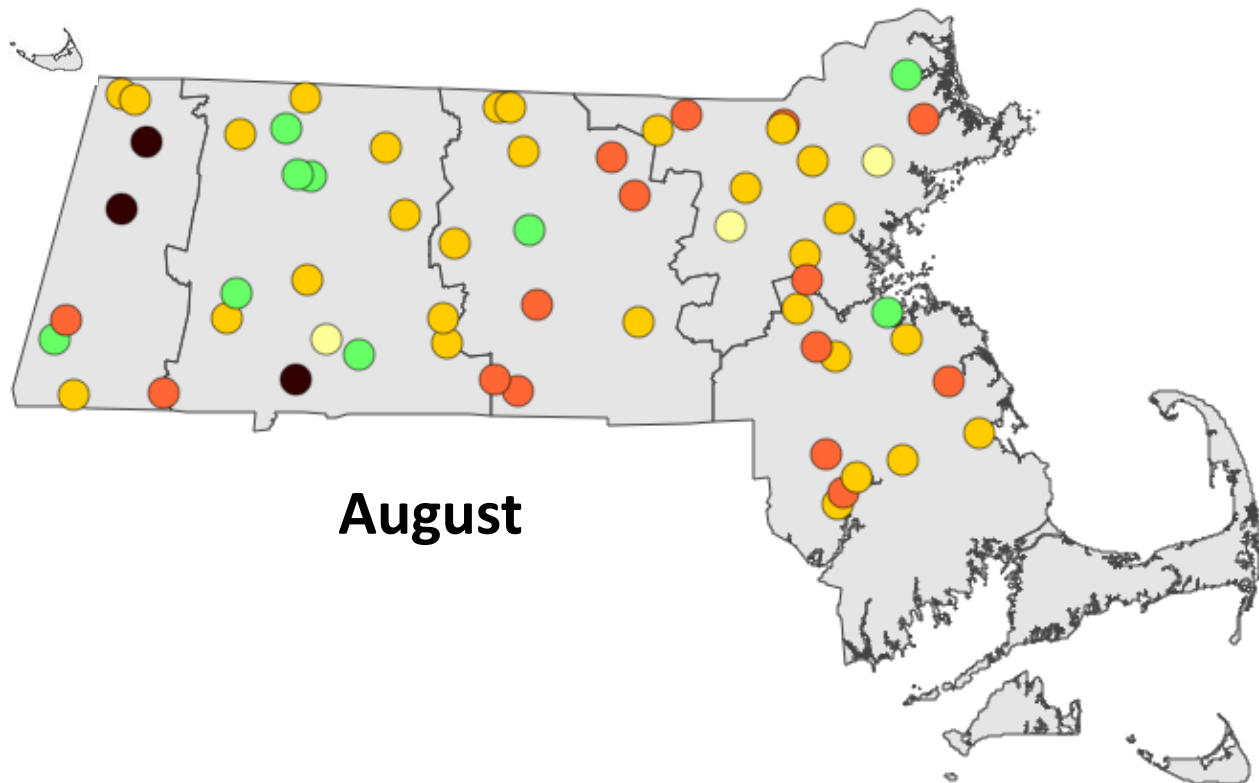
Index Severity Levels



Streamflow Percentiles of Monthly Median

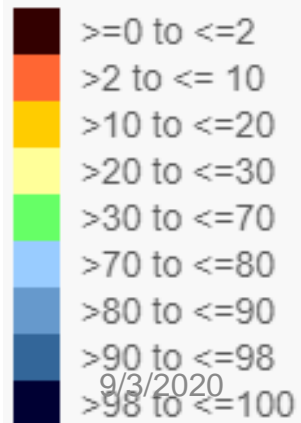


July



August

Percentiles



9/3/2020

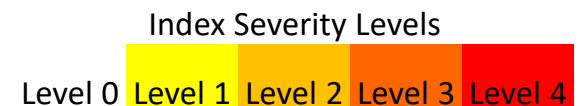
Streamflow Index

By Drought Region

- April, May - All regions at Index Severity Level 0
- June - Western, CT River Valley, Central Level 3; Northeast Level 2; Southeast Level 0
- July – Western, CT River Valley Level 1

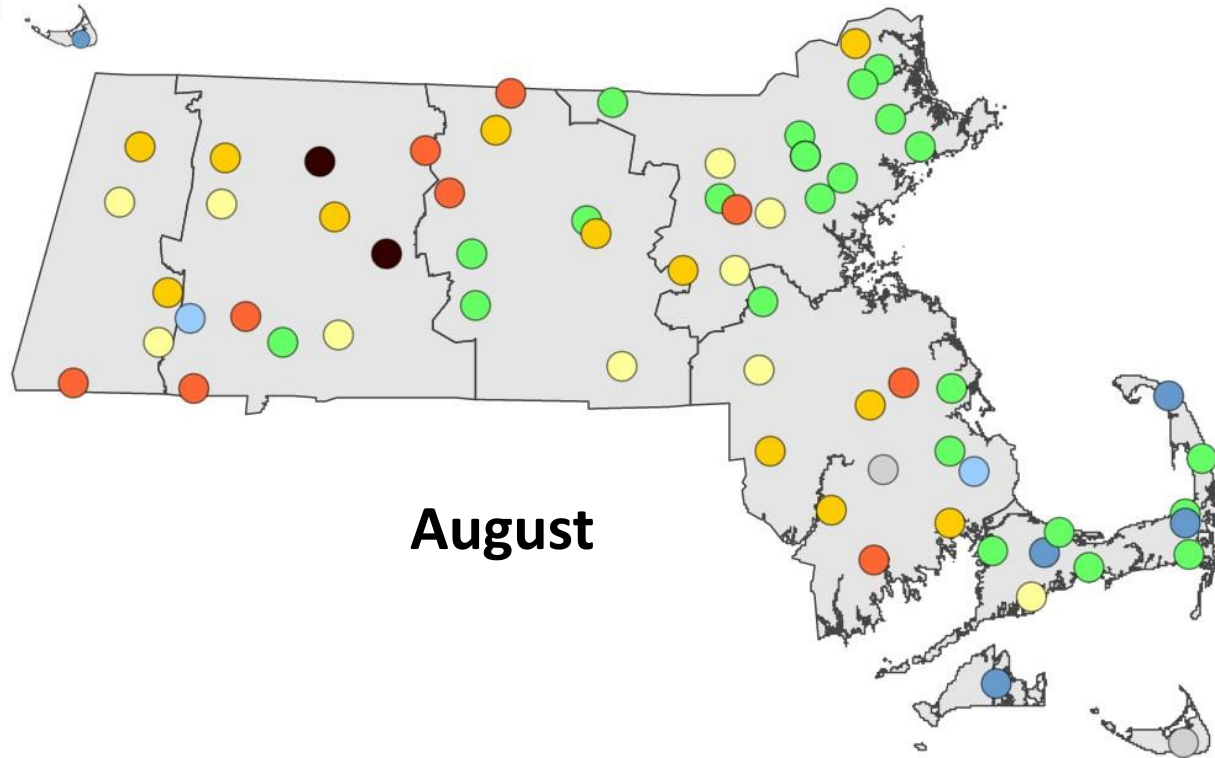
| Region | Number of Gages | | | | | | Median of Individual Gage Percentiles | DMP Index Severity |
|-----------------|----------------------------|---------------------|----------------------|-----------------------|-----------------------|----------------|---------------------------------------|--------------------|
| | Total Reporting for August | ≥0 to ≤2 Percentile | >2 to ≤10 Percentile | >10 to ≤20 Percentile | >20 to ≤30 Percentile | >90 Percentile | | |
| Western | 8 | 2 | 2 | 3 | 0 | 0 | 10 | 3 |
| CT River Valley | 15 | 1 | 0 | 8 | 1 | 0 | 19 | 2 |
| Central | 11 | 0 | 5 | 5 | 0 | 0 | 14 | 2 |
| Northeast | 13 | 0 | 4 | 6 | 2 | 0 | 16 | 2 |
| Southeast | 12 | 0 | 4 | 7 | 0 | 0 | 13 | 2 |

Notes: Not all gages report in all months due to ice, beaver dams or other conditions. Streamflow index is not applicable to Cape Cod and the Islands.

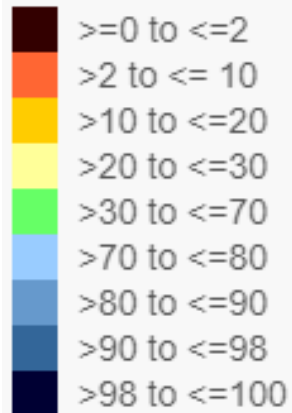


Groundwater Wells Percentiles

July



Percentiles



9/3/2020

Groundwater Index

By Drought Region

- April - All regions Level 0
- May - Western Level 1
- June - Western & Central Level 1; CT River Valley Level 2
- July – Western, CT River Valley, Central Level 1

| Region | Number of Wells | | | | | | Median of Individual Well Percentiles | DMP Index Severity |
|-----------------|----------------------------|---------------------|----------------------|-----------------------|-----------------------|----------------|---------------------------------------|--------------------|
| | Total Reporting for August | ≥0 to ≤2 Percentile | >2 to ≤10 Percentile | >10 to ≤20 Percentile | >20 to ≤30 Percentile | >90 Percentile | | |
| Western | 5 | 0 | 1 | 2 | 2 | 0 | 13 | 2 |
| CT River Valley | 11 | 2 | 3 | 2 | 2 | 0 | 13 | 2 |
| Central | 9 | 0 | 2 | 3 | 1 | 0 | 16 | 2 |
| Northeast | 16 | 0 | 1 | 1 | 3 | 1 | 37 | 0 |
| Southeast | 11 | 0 | 2 | 4 | 1 | 0 | 16 | 2 |
| Cape Cod | 10 | 0 | 0 | 0 | 1 | 0 | 56 | 0 |
| Islands | 1* | 0 | 0 | 0 | 0 | 0 | 83 | 0 |

*Nantucket 228 was not measured. However, Nantucket 44 and 46 were both above to well above average.

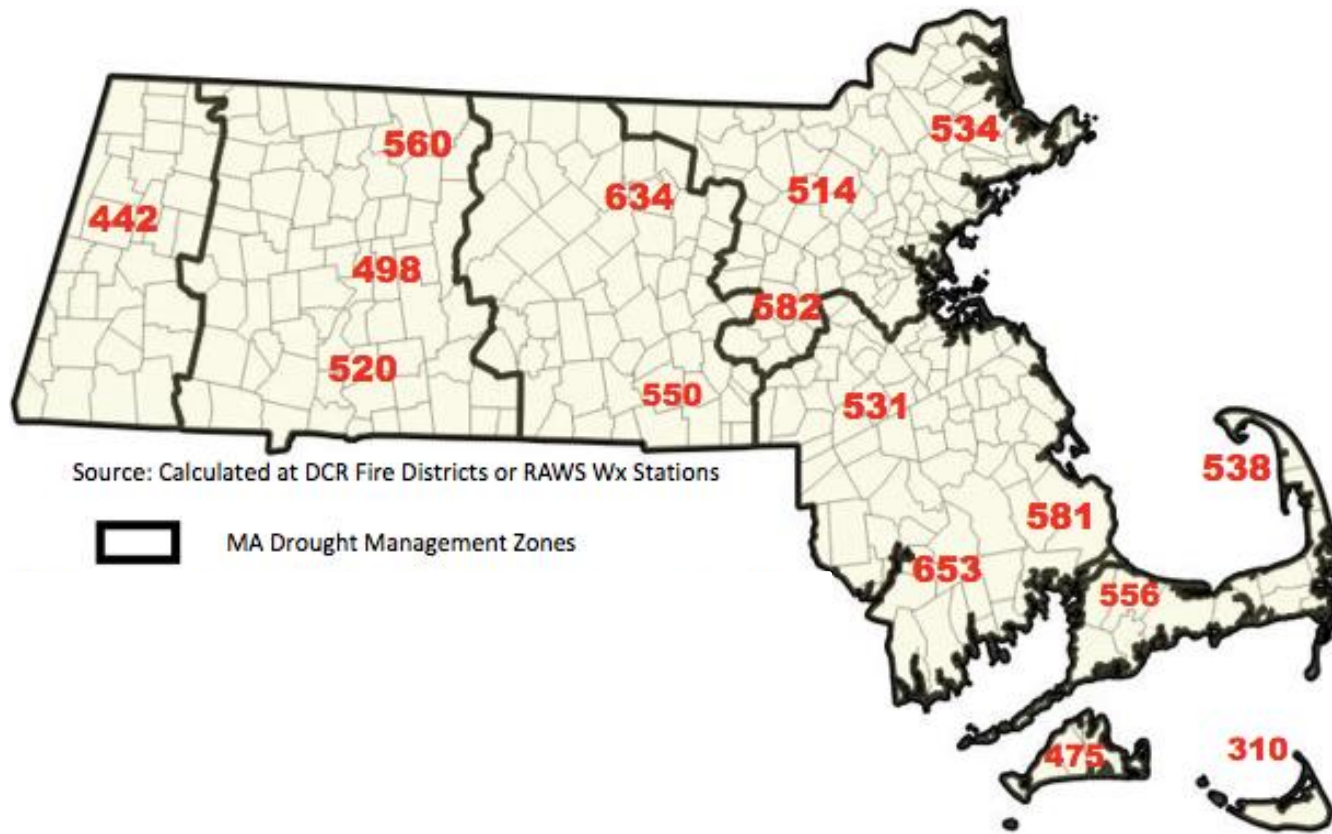
Index Severity Levels

Level 0 Level 1 Level 2 Level 3 Level 4

KBDI

As of August 31, 2020:

- Index Severity Level 2: **Western, CT River Valley, Northeast, Cape Cod, Islands**
- Index Severity Level 3: **Central, Southeast**



| Index Severity Level | KBDI Range |
|----------------------|-------------|
| 0 | <200 |
| 1 | 200 to <400 |
| 2 | 400 to <600 |
| 3 | 600 to <700 |
| 4 | 700 to <800 |

Fire Danger Index indicates dryness in the top 8" of soil.
Data provided by the DCR Fire Chief

Crop Moisture Index

The week ending August 25, 2020:

Index Severity Level 1 for: **Western Region**

Index Severity Level 2 for: **CT River Valley, Central, Northeast, Southeast, Cape Cod, & Islands Regions**



| Index Severity Level | Crop Moisture Index |
|----------------------|---------------------|
| 0 | > -1.0 |
| 1 | ≤ -1.0 and > -2.0 |
| 2 | ≤ -2.0 and > -3.0 |
| 3 | ≤ -3.0 and > -4.0 |
| 4 | ≤ -4.0 |

The NOAA CPC CMI shows the *short-term need versus available water* in a shallow soil profile and responds quickly to changing conditions. This indicator is *relevant during growing season*.

Lakes & Impoundments

August

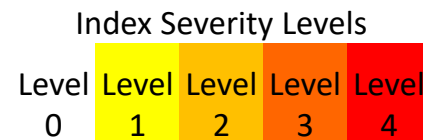
| Drought Region | Number Reporting | Percentile | DMP Index Severity |
|-----------------|------------------|------------|--------------------|
| Western | 2 | 36 | Level 0* |
| CT River Valley | 2 | 22 | Level 1 |
| Central | 2 | 38 | Level 0 |
| Northeast | 8 | 30 | Level 1 |
| Southeast | 1 | 12 | Level 2** |
| Cape Cod | 1 | 67 | Level 0 |
| Islands | NA | NA | NA |

Notes:

* One community at stage 1 of their drought plan going to stage 2; both communities at voluntary & looking to mandatory restrictions

** A community that has not reported is under drought watch & has mandatory restrictions

DMP index severity levels do not necessarily reflect water supply status.



Summary of Drought Indices by Drought Region

August 2020

| Drought Index | Western | CT River Valley | Central | Northeast | Southeast | Cape | Islands |
|------------------------|---------|-----------------|---------|-----------|-----------|---------|---------|
| Precipitation | Level 1 | Level 2 | Level 1 | Level 1 | Level 2 | Level 4 | Level 3 |
| Streamflow | Level 3 | Level 2 | Level 2 | Level 2 | Level 2 | N/A | N/A |
| Groundwater | Level 2 | Level 2 | Level 2 | Level 0 | Level 2 | Level 0 | Level 0 |
| Lakes/ Impoundments | Level 0 | Level 1 | Level 0 | Level 1 | Level 2 | Level 0 | N/A |
| Crop Moisture Index | Level 1 | Level 2 | Level 2 | Level 2 | Level 2 | Level 2 | Level 2 |
| KBDI | Level 2 | Level 2 | Level 3 | Level 2 | Level 3 | Level 2 | Level 2 |

Lakes & Impoundments Index does not reflect water supply status.

This summary is provided for informational purposes. No changes in drought status are official until Secretary of the Executive Office of Energy and Environmental Affairs. Data are preliminary and not final until all data are reported.

DMTF Deliberation

