

# Hydrologic Conditions in Massachusetts for June 2024

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DCR Office of Water Resources

## **Drought Management Task Force**

July 10, 2024

Meeting Co-Chairs: EOEEA, MEMA



# MA Drought Management Plan Indices

Numbers in parentheses indicate number of data points across the state



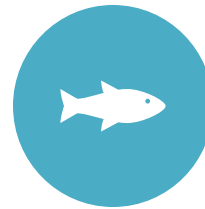
Precipitation (93)



Streamflow (59)



Groundwater (63)



Lakes and  
Impoundments (20)



KBDI - Fire Danger  
(36)



Evapotranspiration  
(national map)

# MA Drought Management Plan

## Index Severity Levels

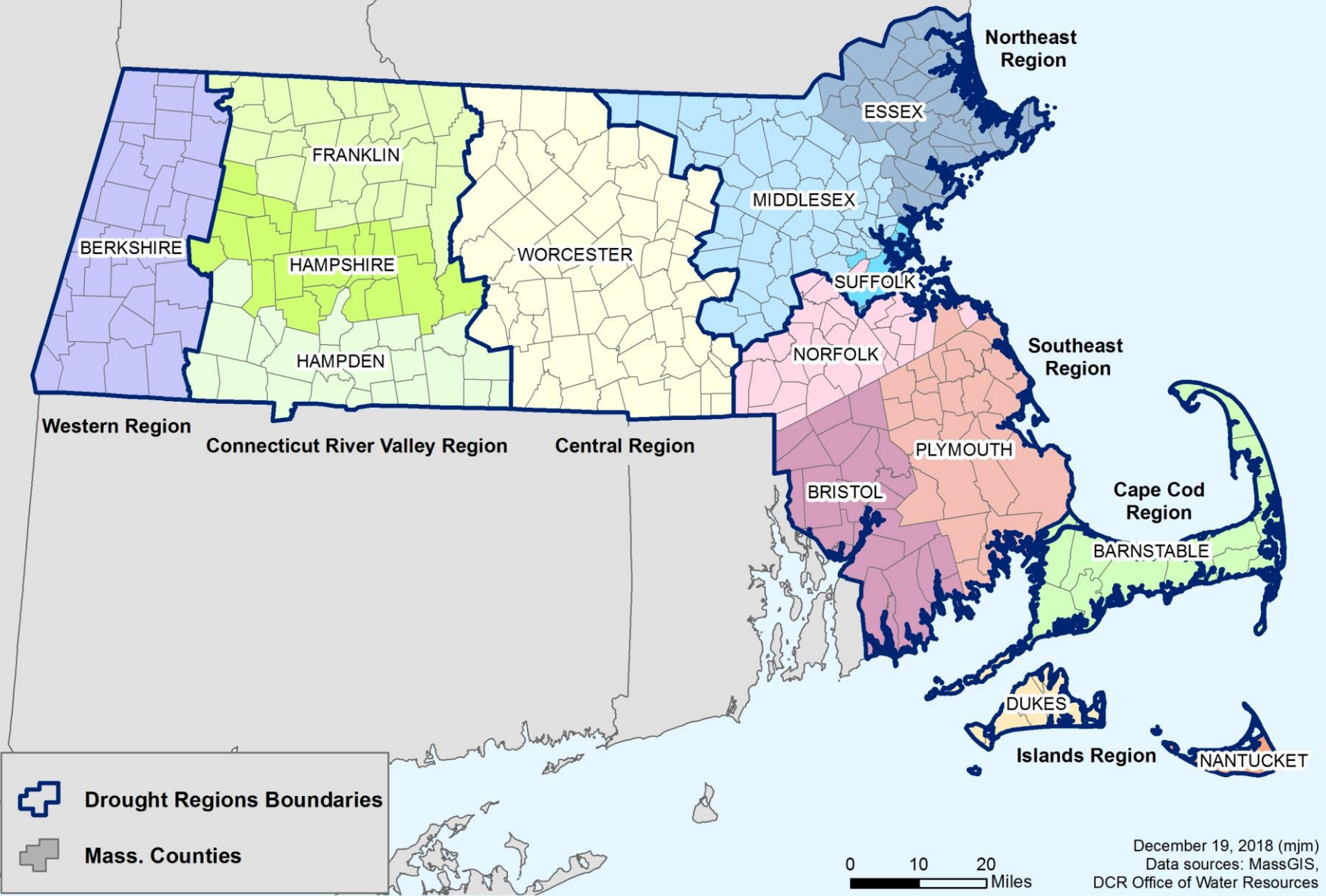
Index Severity Level	Percentiles for: Precipitation, Streamflow, Lakes and Impoundments, Groundwater, and Evapotranspiration	Keetch-Byram Drought Index
0	>30 <sup>th</sup> percentile	< 200
1	≤30 and >20	200-400
2	≤20 and >10	400-600
3	≤10 and >2	600-700
4	≤2	700-800

# MA Drought Management Plan

## Drought Levels



# MASSACHUSETTS DROUGHT REGIONS with Counties

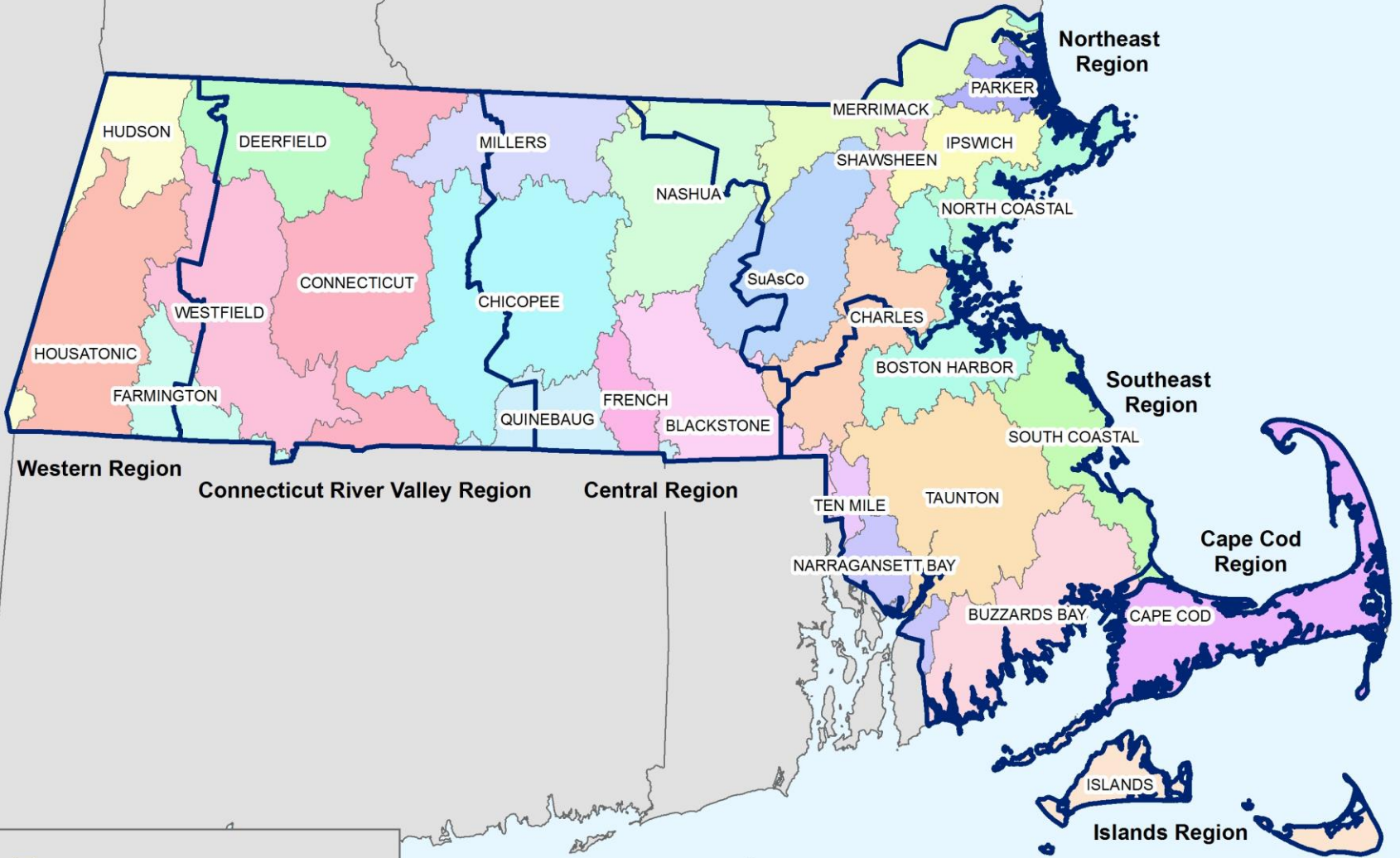


-  Drought Regions Boundaries
-  Mass. Counties

0 10 20  
Miles

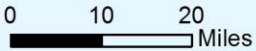
December 19, 2018 (mjm)  
Data sources: MassGIS,  
DCR Office of Water Resources

# MASSACHUSETTS DROUGHT REGIONS with Watersheds



 Drought Regions Boundaries

 Mass. Counties



October 11, 2019 (mjm)  
Data sources: MassGIS,  
DCR Office of Water Resources

# Task Force Member Updates



Hydrologic  
Conditions



Weather &  
Forecast



Water Supply  
Impacts



Environmental  
Impacts



Agricultural  
Impacts



Fire Danger



Engineering/  
Infrastructure  
Impacts



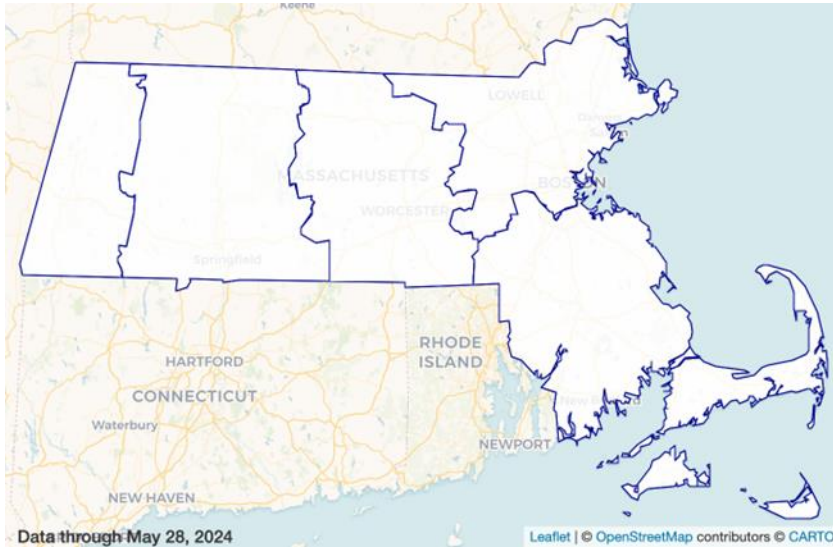
Public Health  
Impacts

# Recent Hydrologic History- Western Region

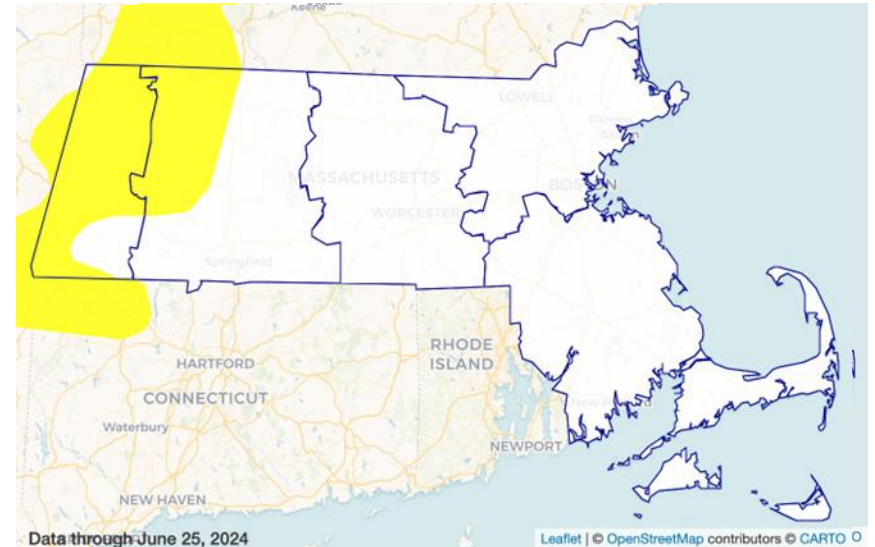
- **Week of May 29 –June 5:** more than 1 below-normal index for first time
  - 60-day precipitation: Level 2
  - 30-day streamflow: Level 2
  - KBDI: Level 1
- **June:** conditions fluctuated but at least 2 indices stayed below-normal
  - Worst conditions mid-month, same as those last week of May



# US Drought Monitor



Data through May 28 , 2023

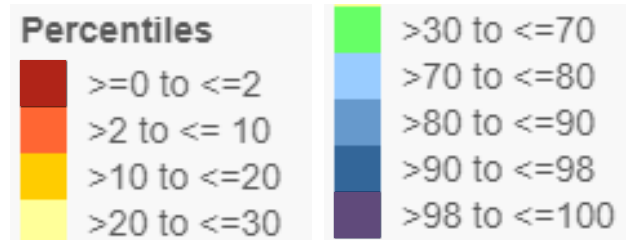
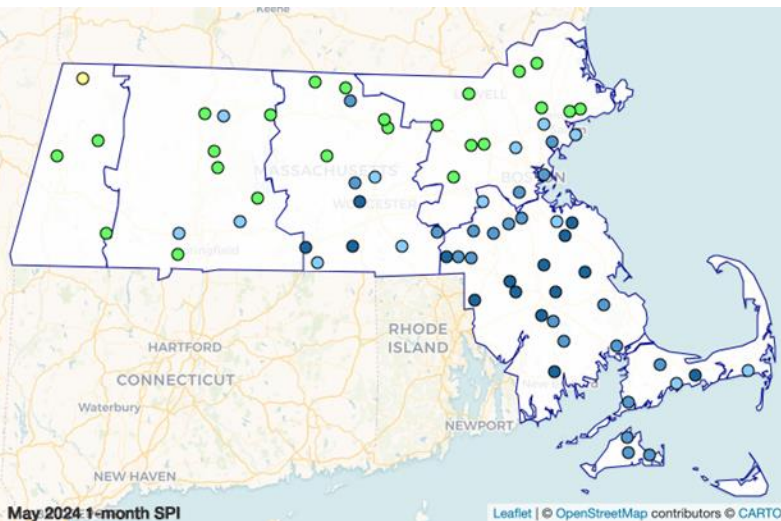
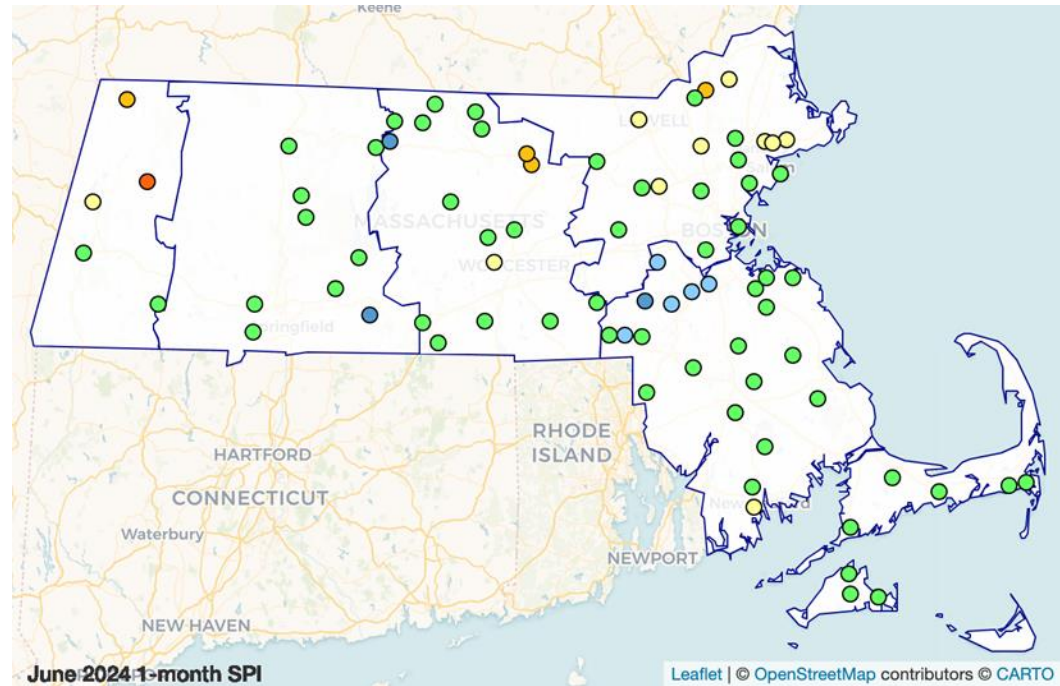
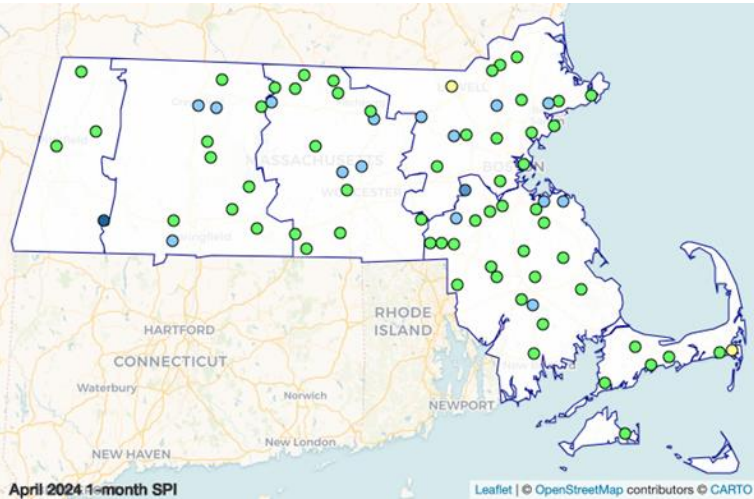


Data through June 25, 2024

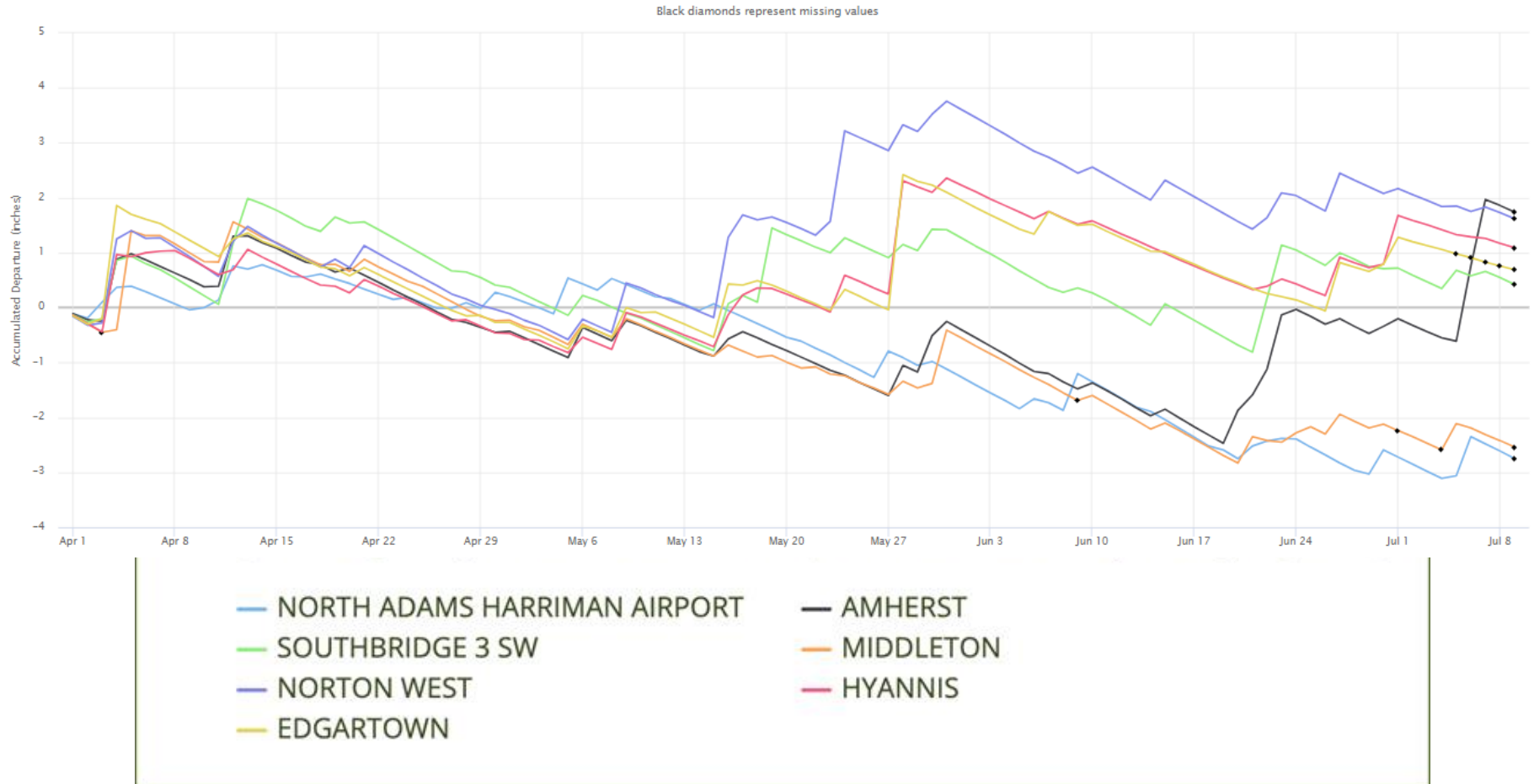
- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

USDM	=	MA DMP
0	=	1
1	=	2
2,3	=	3
4	=	4

# Standardized Precipitation Index



# Accumulated Precipitation Departure from 30-Year Average in inches



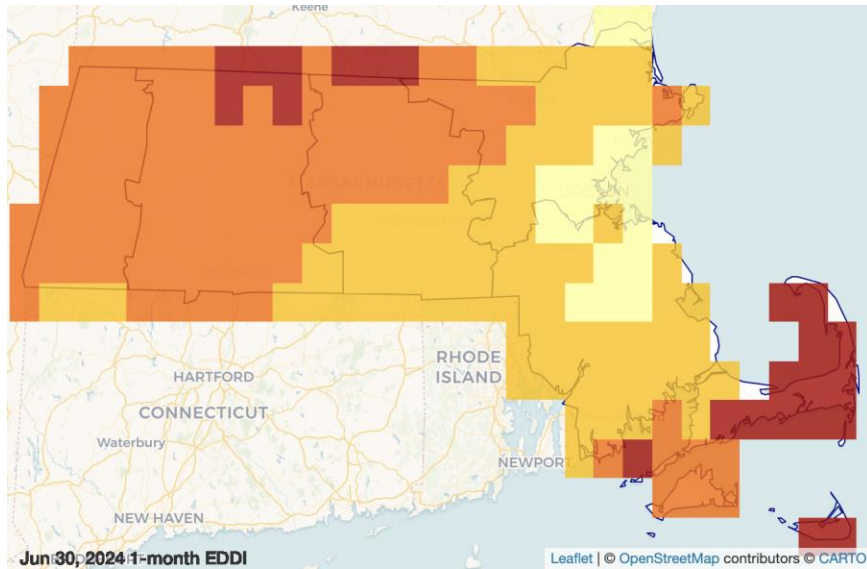
- Graph does not consider starting condition's wetness/dryness
- Does not show summer heat waves with high ET
- Only 1 station per Drought Region is shown.

# Standardized Precipitation Index as Percentile

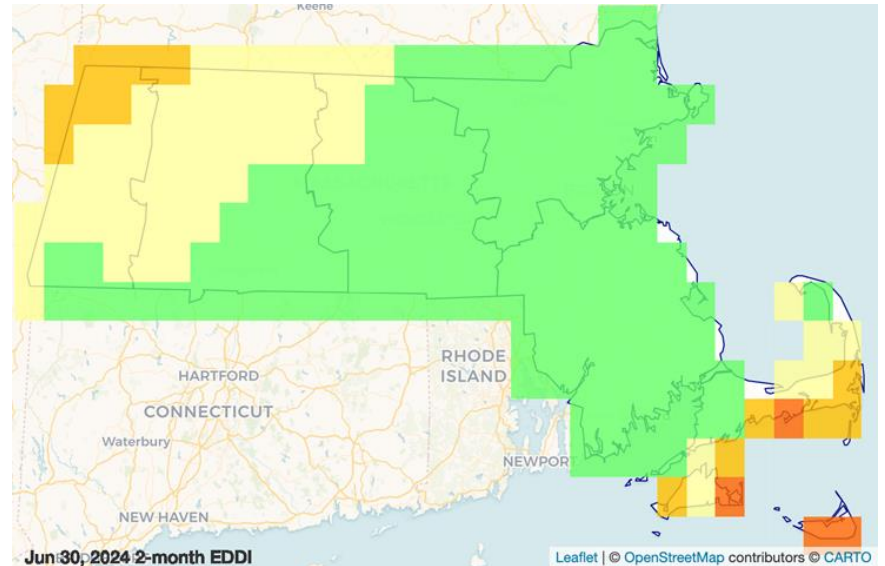
REGION	NUMBER OF SITES	1-mo	2-mo	3-mo	6-mo	9-mo	12-mo	24-mo	36-mo			
WESTERN	5	28	22	25	69	81	91	78	92			
CTRV	9	59	59	61	92	86	98	95	94			
CENTRAL	17	48	63	69	92	89	99	97	98			
NORTHEAST	19	33	43	49	87	81	98	89	93			
SOUTHEAST	21	55	83	80	97	90	98	92	94			
CAPE COD	5	40	67	57	85	53	72	Level 0	Level 1	Level 2	Level 3	Level 4
ISLANDS	3	47	75	63	91	54	76	54	60			

# Evapotranspiration

1-month



2-month

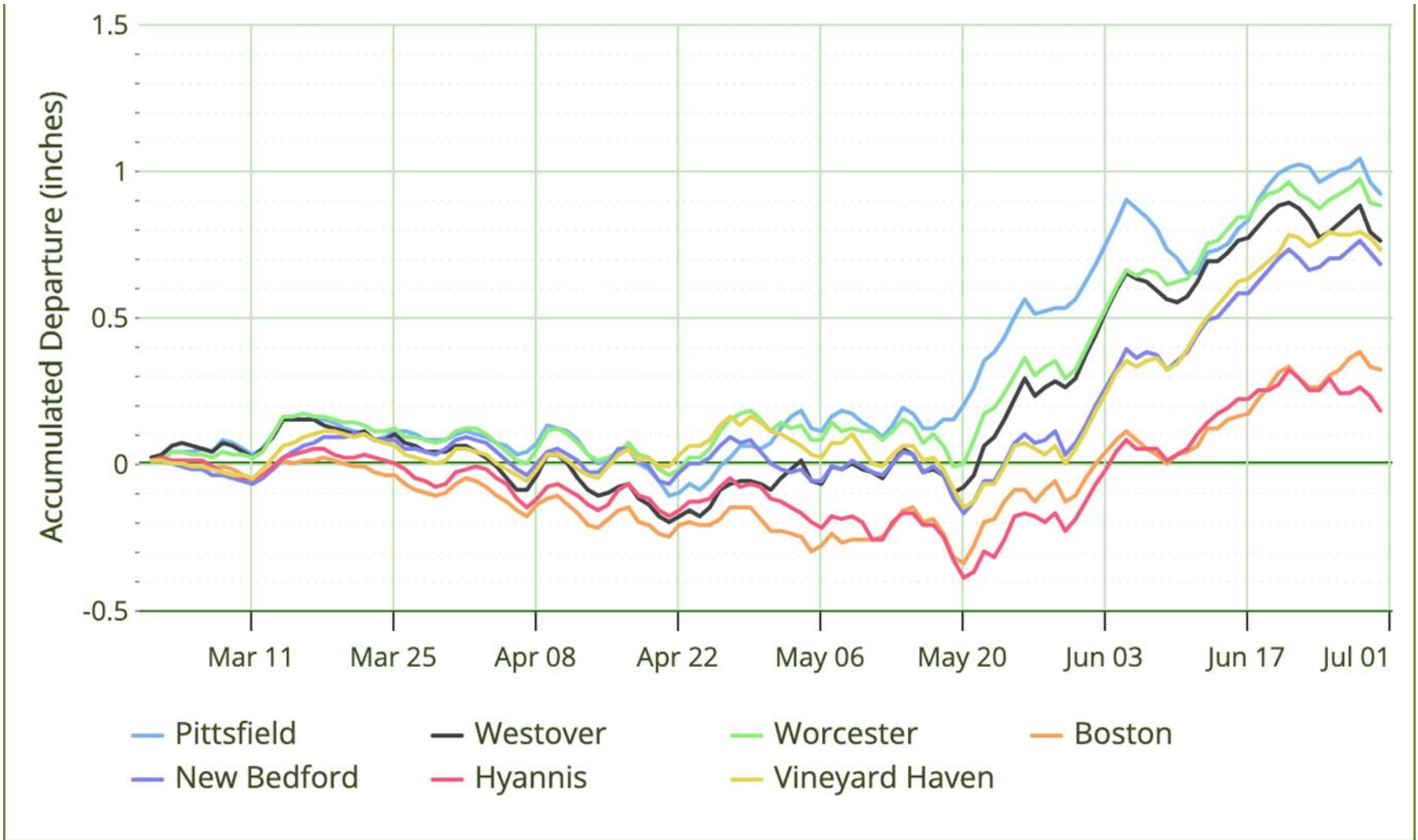


REGION	MEDIAN 2-MONTH EDDI (2024-06-30)
WESTERN	26
CTRV	30
CENTRAL	42
NORTHEAST	47
SOUTHEAST	51
CAPE COD	28
ISLANDS	18

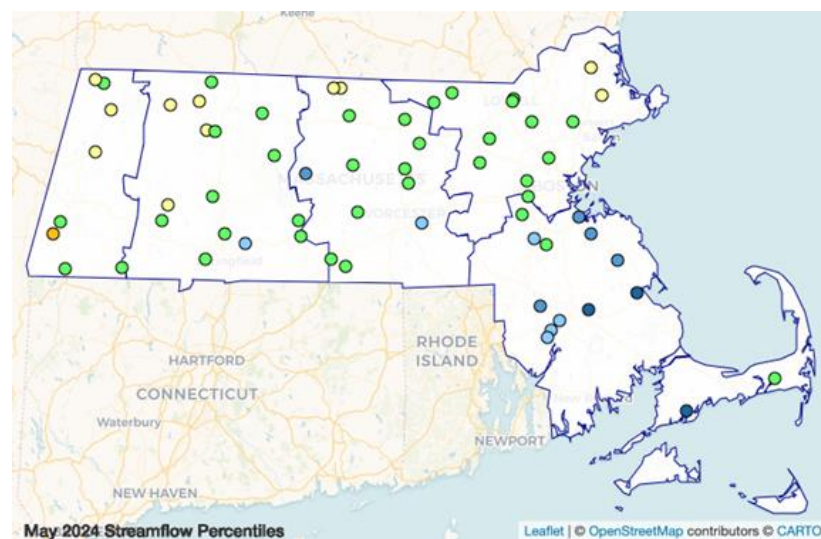
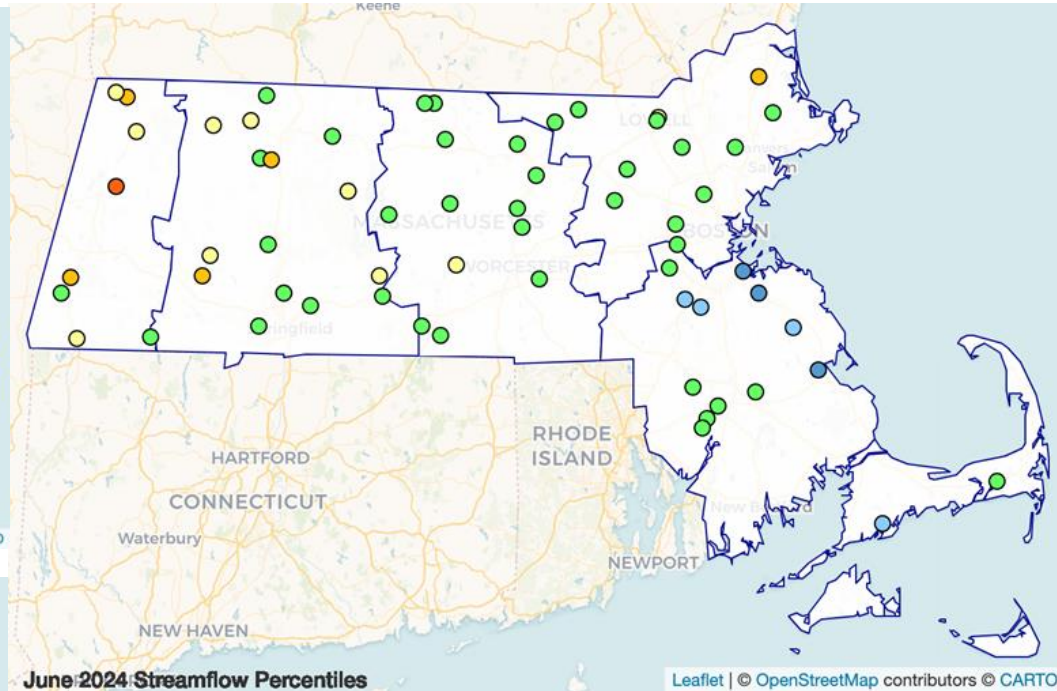
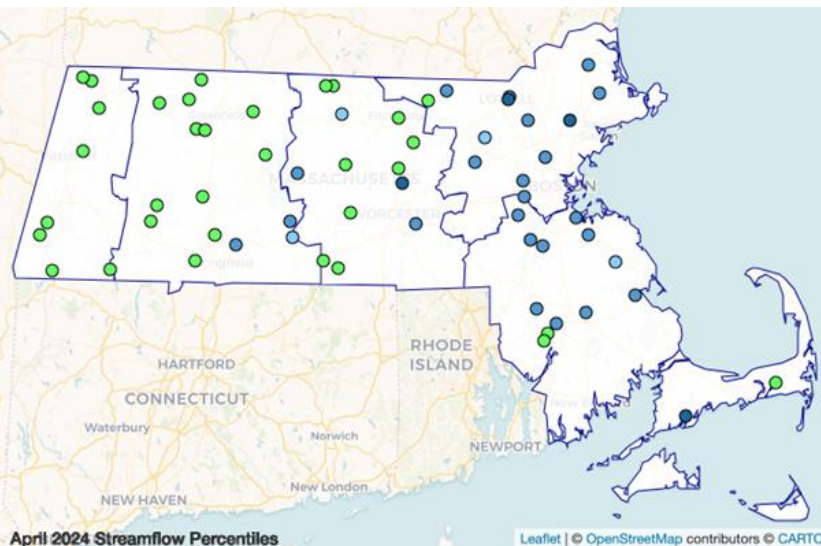
Drought Levels				
Level 0	Level 1	Level 2	Level 3	Level 4



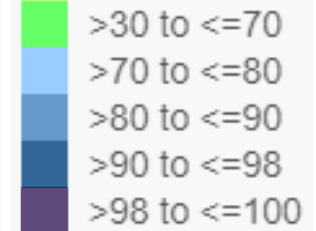
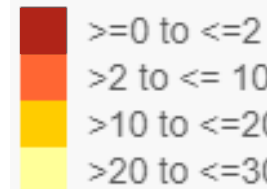
# Accumulated Potential Evapotranspiration Departure from 30-Year Average in inches



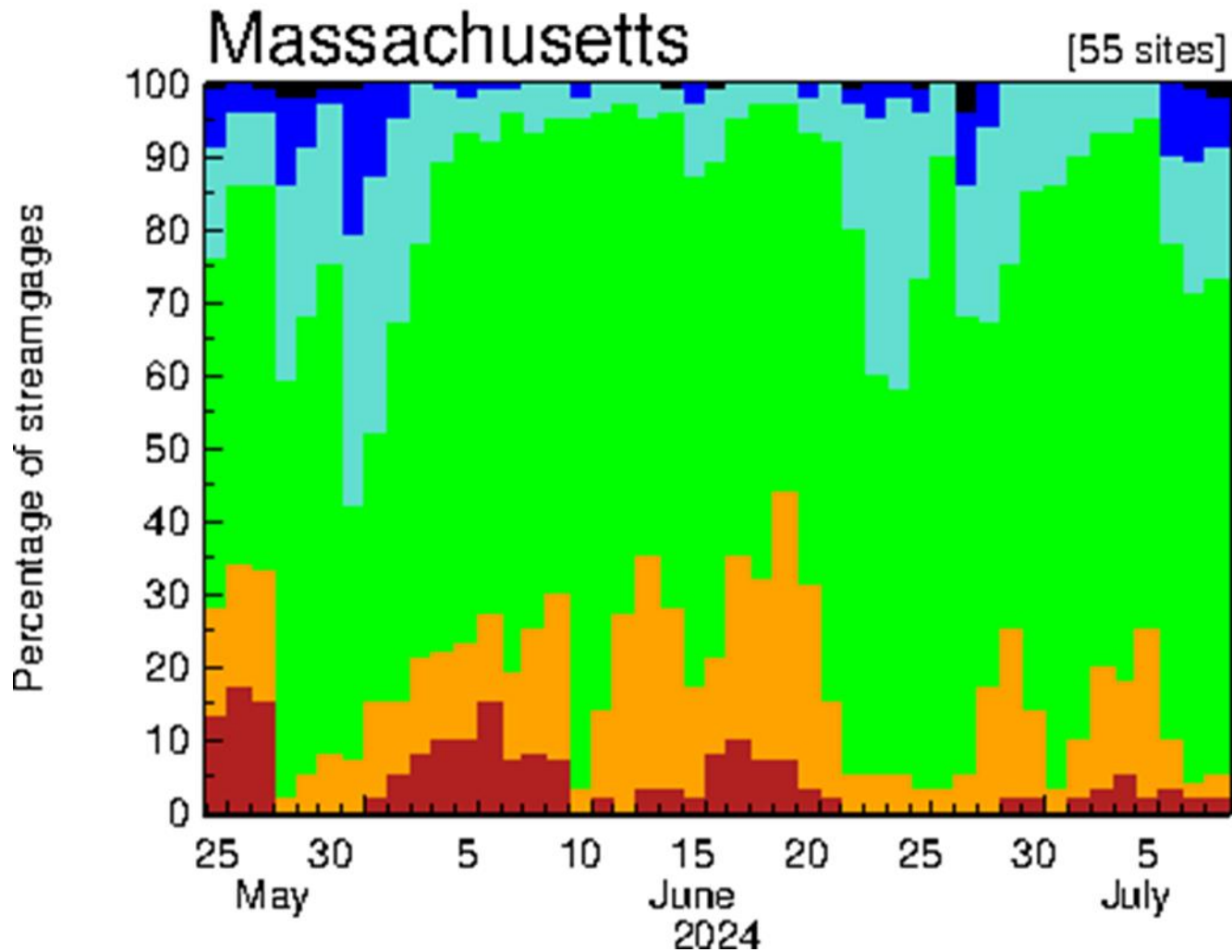
# Streamflow Percentiles of Monthly Median



## Percentiles



# Percent of Gages at Various Percentiles



Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		



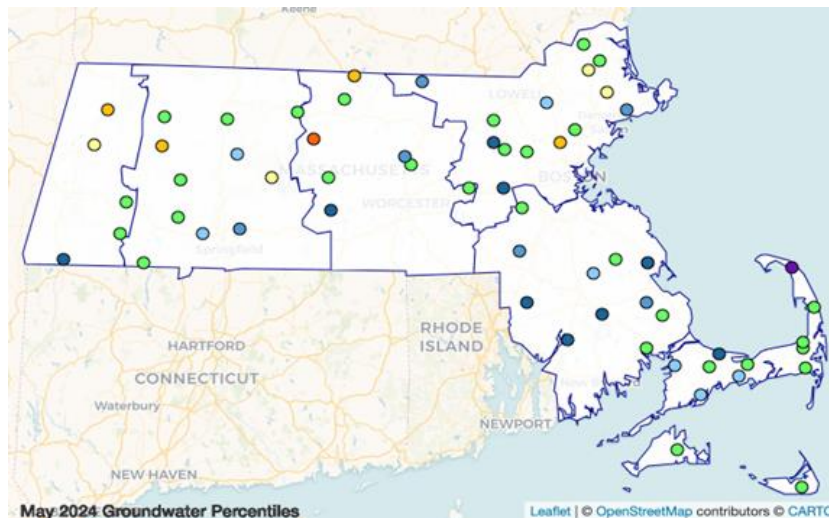
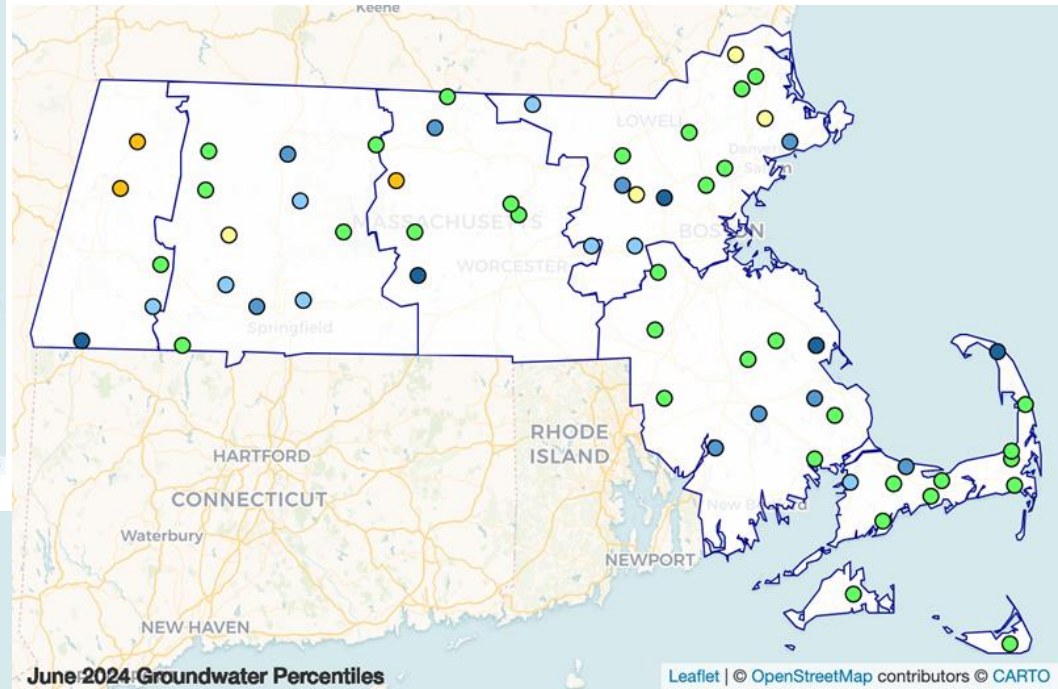
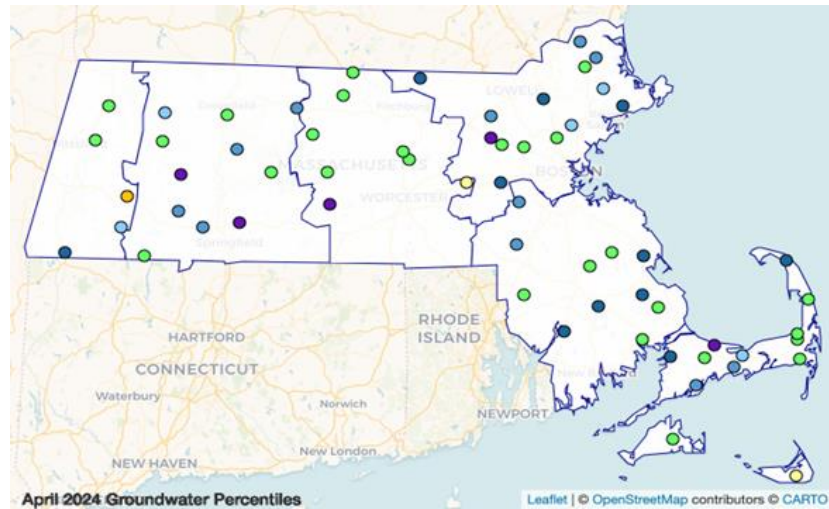
# Streamflow Index

REGION	NUMBER OF GAGES REPORTING	≥0 TO ≤2 PERCENTILE	>2 TO ≤10 PERCENTILE	>10 TO ≤20 PERCENTILE	>20 TO ≤30 PERCENTILE	>90 PERCENTILE	MEDIAN OF INDIVIDUAL GAGE PERCENTILES
WESTERN	8	0	1	2	3	0	24
CTRV	15	0	0	2	6	0	33
CENTRAL	13	0	0	0	1	0	52
NORTHEAST	13	0	0	1	1	0	47
SOUTHEAST	12	0	0	0	0	0	71
CAPE COD	2	0	0	0	0	0	57

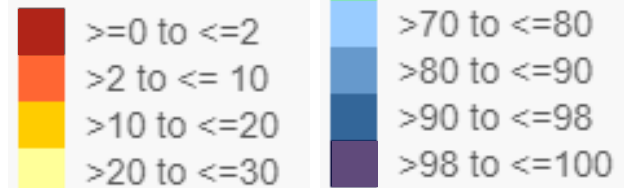
Notes: Not all gages report in all months due to ice, beaver dams or other conditions. The Islands region does not have any streamflow gages.

Drought Levels				
Level 0	Level 1	Level 2	Level 3	Level 4

# Groundwater Percentiles



## Percentiles

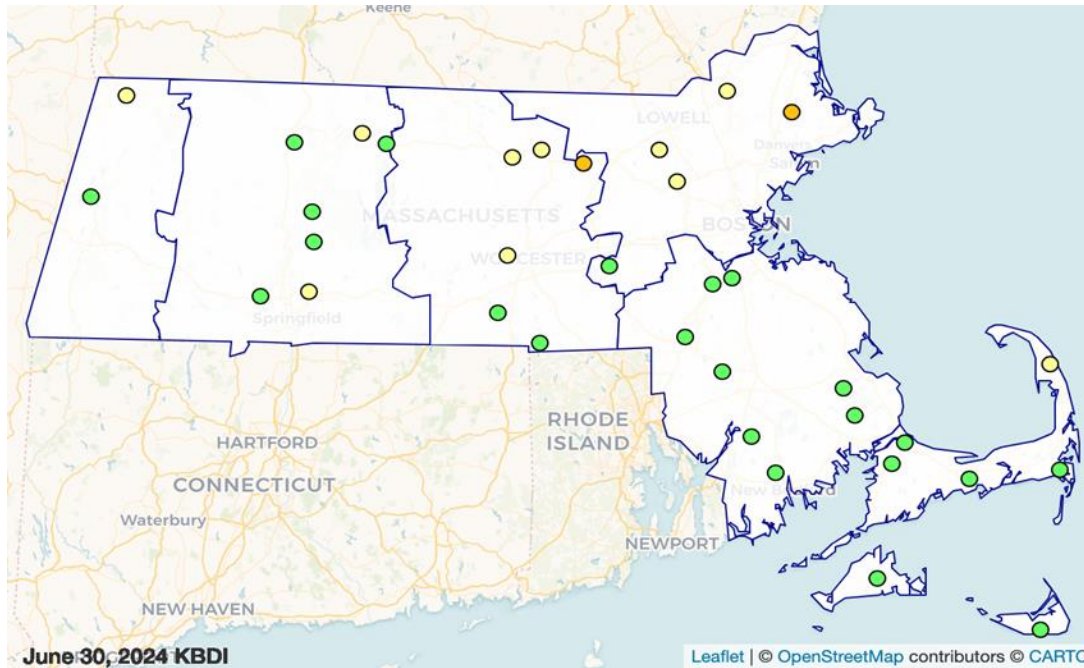


# Groundwater Index

REGION	NUMBER OF WELLS REPORTING	≥0 TO ≤2 PERCENTILE	>2 TO ≤10 PERCENTILE	>10 TO ≤20 PERCENTILE	>20 TO ≤30 PERCENTILE	>90 PERCENTILE	MEDIAN OF INDIVIDUAL WELL PERCENTILES
WESTERN	5	0	0	2	0	1	61
CTRV	11	0	0	0	1	0	62
CENTRAL	8	0	0	1	0	1	57
NORTHEAST	14	0	0	0	3	1	53
SOUTHEAST	12	0	0	0	0	1	67
CAPE COD	11	0	0	0	0	1	65
ISLANDS	2	0	0	0	0	0	54

Drought Levels				
Level 0	Level 1	Level 2	Level 3	Level 4

# KBDI - Top 8 inches of soil moisture

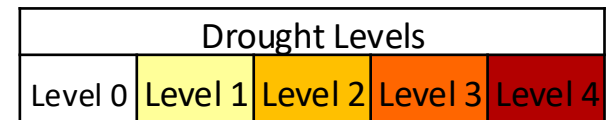


Point Values - KBDI Range



REGION	NUMBER OF SITES REPORTING	HIGHEST OF SITE VALUES
WESTERN	2	239
CTRV	7	251
CENTRAL	6	405
NORTHEAST	5	402
SOUTHEAST	8	199
CAPE COD	5	250
ISLANDS	2	84

Drought Levels



# Lakes & Impoundments

REGION	NUMBER OF SITES REPORTING	MEDIAN OF INDIVIDUAL PERCENTILES OR PERCENT FULL
WESTERN	2	17th
CTRV	2	52nd
CENTRAL	3	47th
NORTHEAST	5	69th
SOUTHEAST	2	89th
CAPE COD	1	57th

Notes:

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

Drought Levels				
Level 0	Level 1	Level 2	Level 3	Level 4

# Drought Indices by Region, June 2024

Drought Index	Western	CT River Valley	Central	Northeast	Southeast	Cape	Islands
Precipitation (2 mos)	22	59	63	43	83	67	75
Streamflow	24	33	52	47	71	57	N/A
Groundwater	61	62	57	53	67	65	54
Lakes/ Impoundments	17	52	47	69	89	57	N/A
ET	26	30	42	47	51	28	18
KBDI	239	251	405	402	199	250	84
<b>Recommend (07/10 meeting)</b>	<b>Level 1</b>	<b>Level 0</b>	<b>Level 0</b>	<b>Level 0</b>	<b>Level 0</b>	<b>Level 0</b>	<b>Level 0</b>

Lakes & Impoundments Index does not reflect water supply status. This summary is provided for informational purposes. No changes in drought status are official until the Secretary of the Executive Office of Energy and Environmental Affairs makes the final drought declaration for the state after receiving a recommendation from the Drought Management Task Force. Data are preliminary and not final until all data are reported. N/A = not applicable. ID = insufficient data.

Drought Levels				
Level 0	Level 1	Level 2	Level 3	Level 4