

Hydrologic Conditions in Massachusetts for March 2024

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DCR Office of Water Resources

Drought Management Task Force

April 09, 2024

Meeting Co-Chairs: EOEEA, MEMA



MA Drought Management Plan

Indices

Numbers in parentheses indicate number of data points across the state



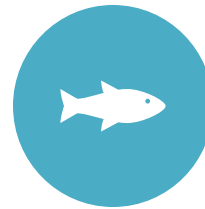
Precipitation (93)



Streamflow (59)



Groundwater (63)



Lakes and
Impoundments (20)



KBDI - Fire Danger
(36)



Evapotranspiration
(national map)

MA Drought Management Plan

Index Severity Levels

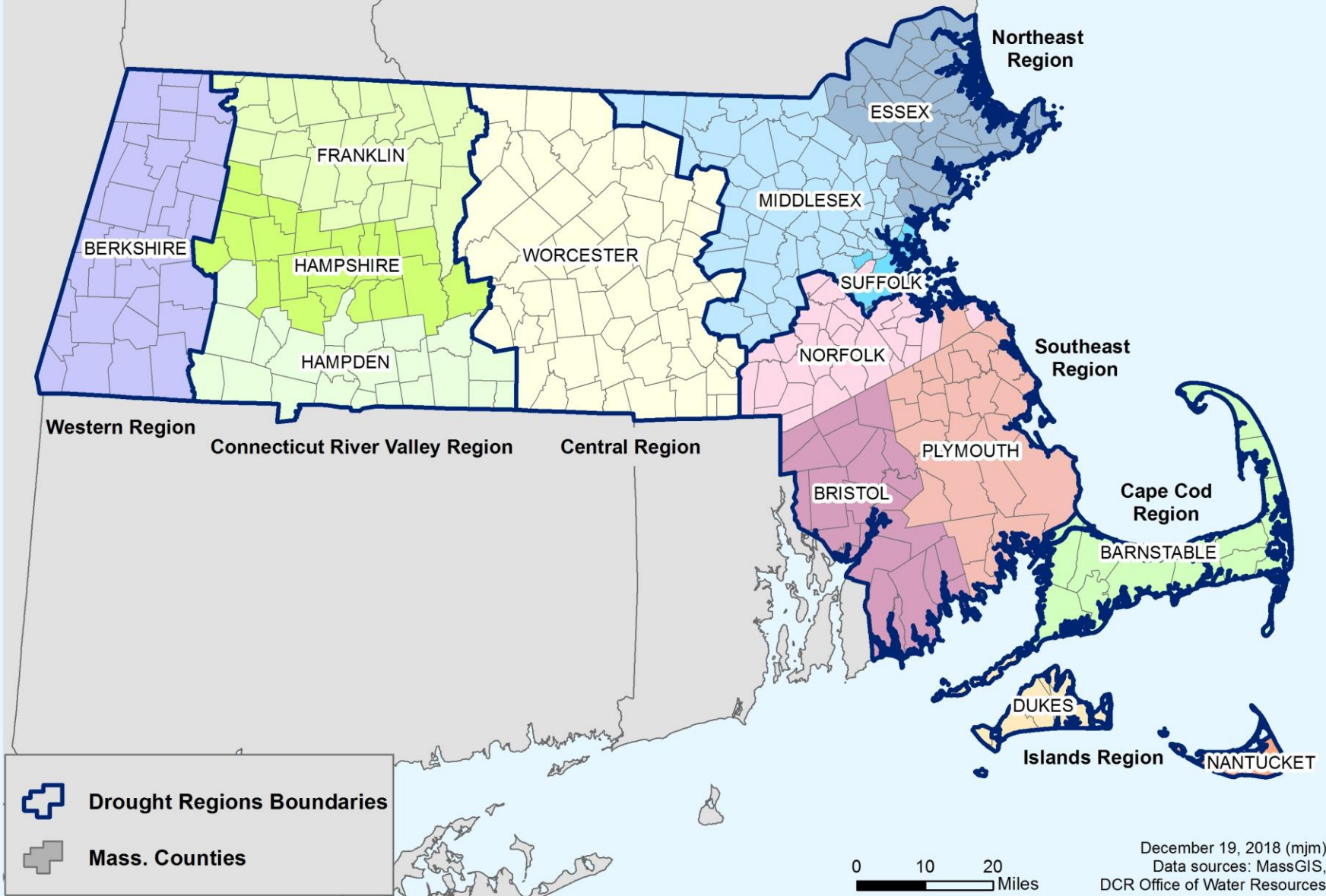
Index Severity Level	Percentiles for: Precipitation, Streamflow, Lakes and Impoundments, Groundwater, and Evapotranspiration	Keetch-Byram Drought Index
0	>30 th percentile	< 200
1	≤30 and >20	200-400
2	≤20 and >10	400-600
3	≤10 and >2	600-700
4	≤2	700-800

MA Drought Management Plan

Drought Levels



MASSACHUSETTS DROUGHT REGIONS with Counties



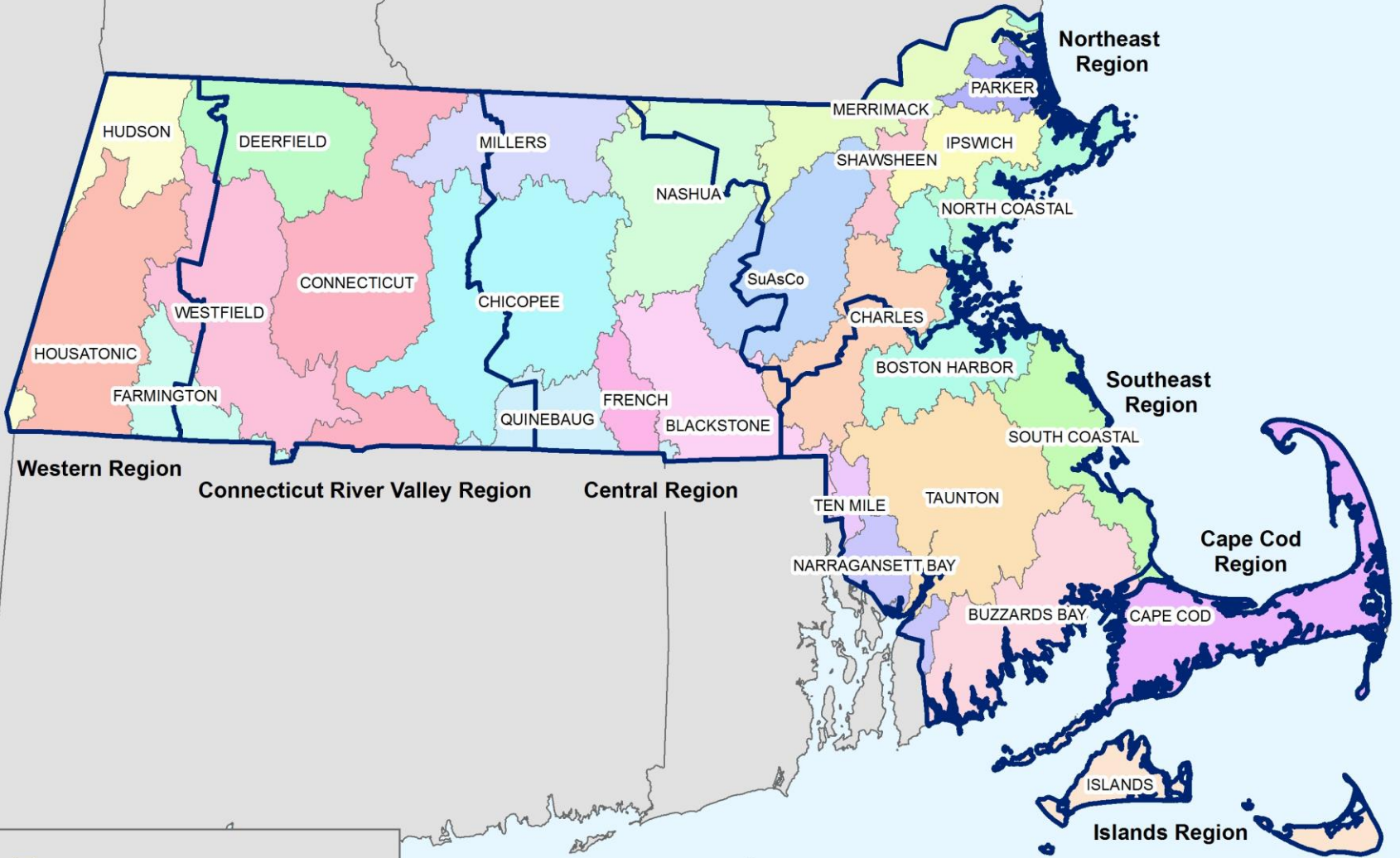
-  Drought Regions Boundaries
-  Mass. Counties

0 10 20
Miles

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

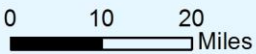


MASSACHUSETTS DROUGHT REGIONS with Watersheds



 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

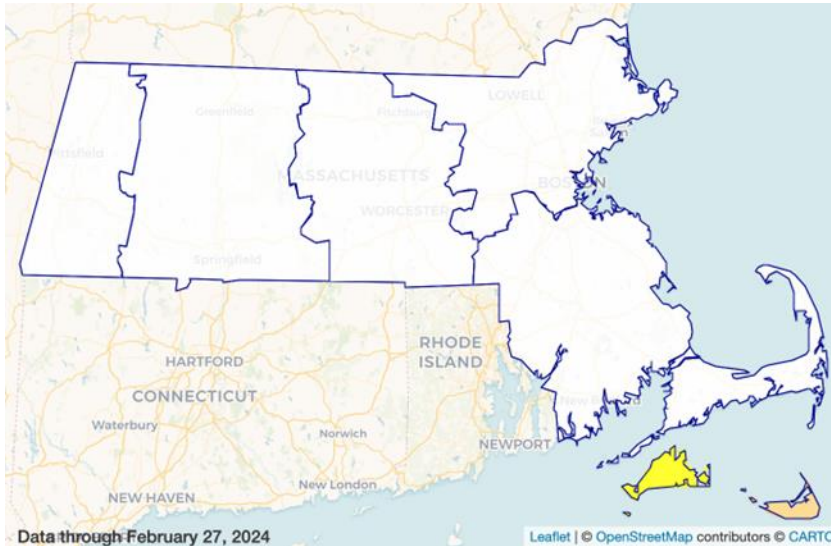


Public Health
Impacts

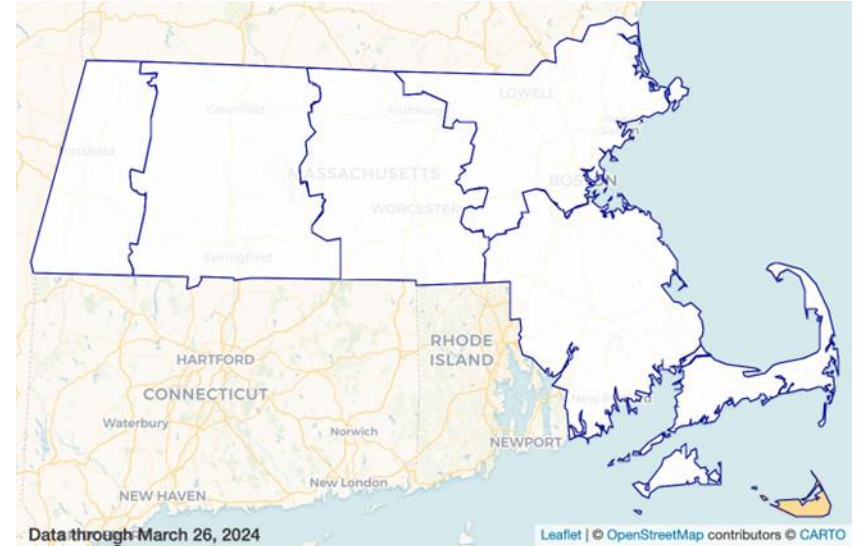
Recent Hydrologic History- Islands

- ***June – Sept 2023***
 - Below-normal to above-normal precipitation; preceding months Feb-Apr dry
 - Declining and below-normal groundwater
- ***October – November 2023***
 - Below-normal precipitation
 - Declining and below-normal groundwater
 - **November is the first month that the Islands are declared to be in a drought (Level 2)**
- ***December 2023***
 - Normal precipitation but 2- and 3- month look back still at elevated ISL
 - Well-below normal for groundwater
- ***January 2024***
 - Above-normal precipitation
 - **Martha's Vineyard fared better than Nantucket for precipitation and groundwater improvements**
- ***February 2024***
 - Below-normal to normal precipitation
 - Groundwater improvement on Martha's Vineyard; not as much on Nantucket
 - Drought Level improves to Level 1
- ***March 2024***
 - Above-normal precipitation
 - Continued groundwater improvement

US Drought Monitor



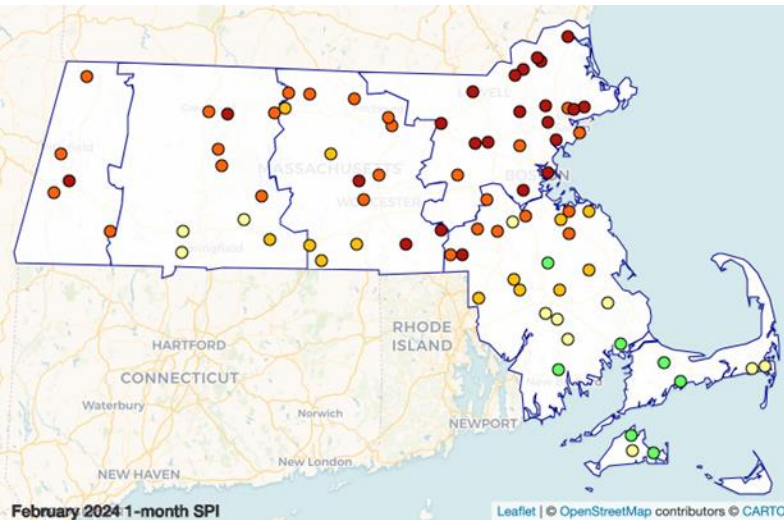
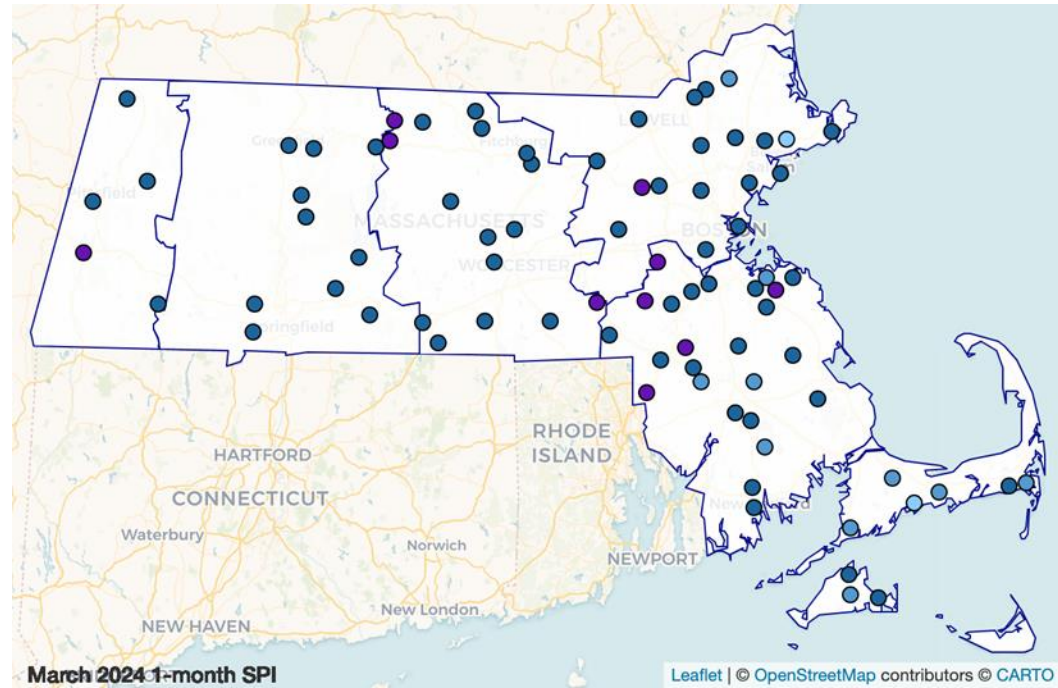
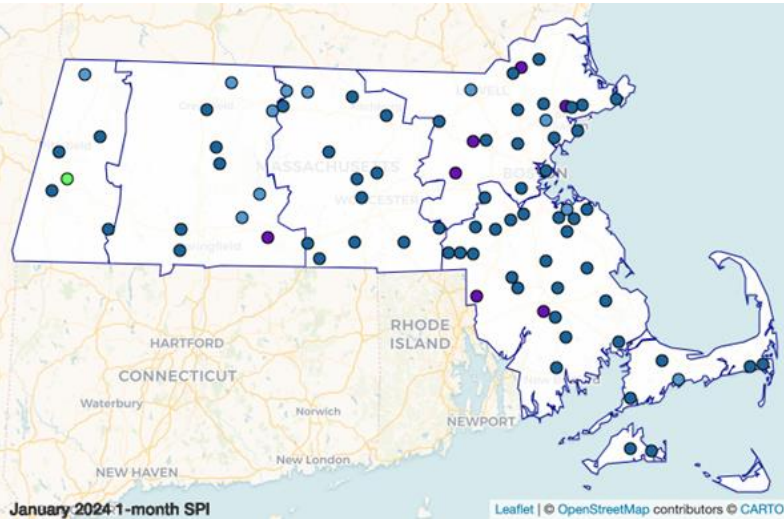
Data through February 27, 2023







Data through March 26, 2024






	USDM	MA DMP
□ None	0	= 1
■ D0 (Abnormally Dry)	1	= 2
■ D1 (Moderate Drought)	2,3	= 3
■ D2 (Severe Drought)	4	= 4
■ D3 (Extreme Drought)		
■ D4 (Exceptional Drought)		

Standardized Precipitation Index

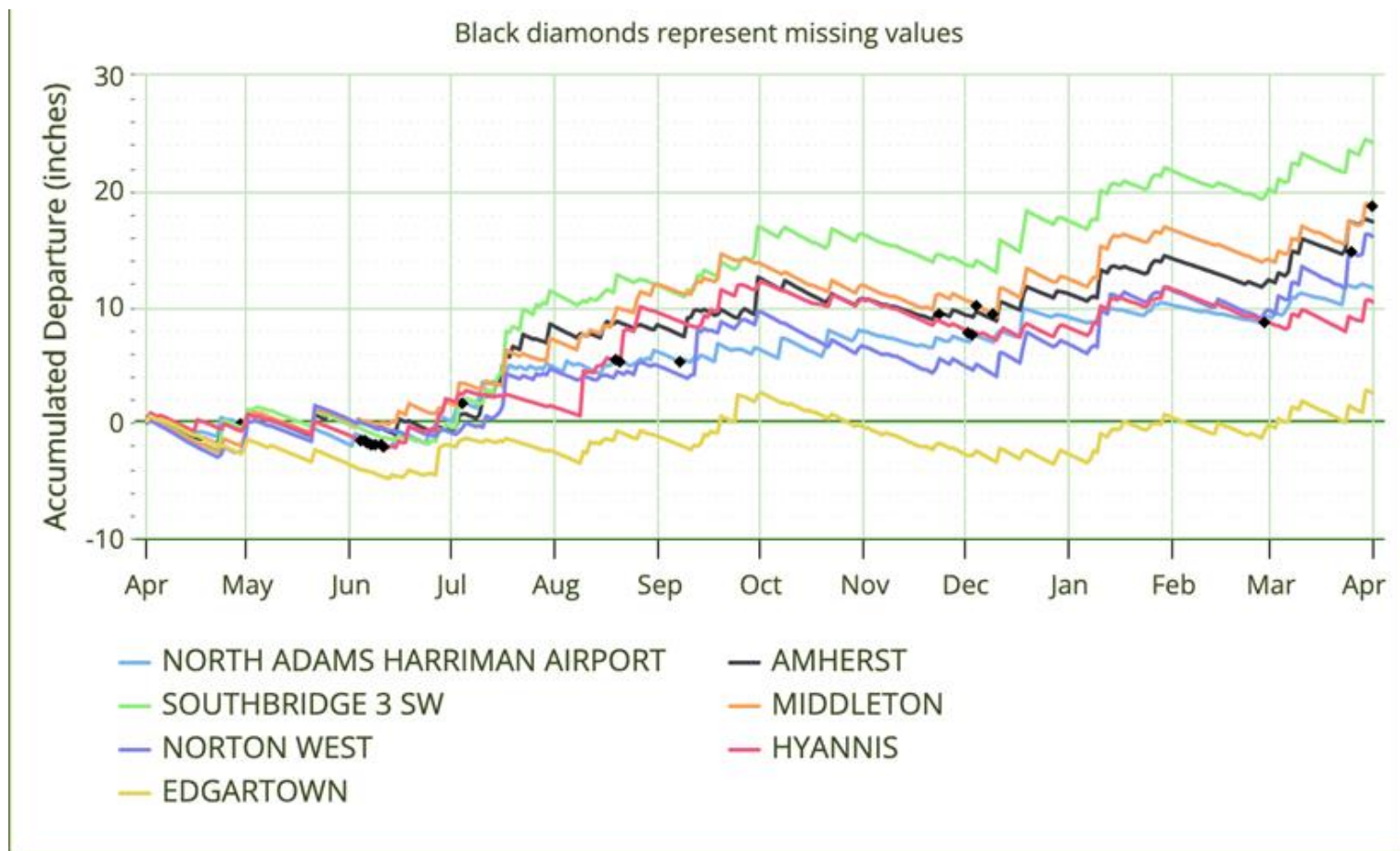


Percentiles

-  ≥ 0 to ≤ 2
-  > 2 to ≤ 10
-  > 10 to ≤ 20
-  > 20 to ≤ 30

-  > 30 to ≤ 70
-  > 70 to ≤ 80
-  > 80 to ≤ 90
-  > 90 to ≤ 98
-  > 98 to ≤ 100

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

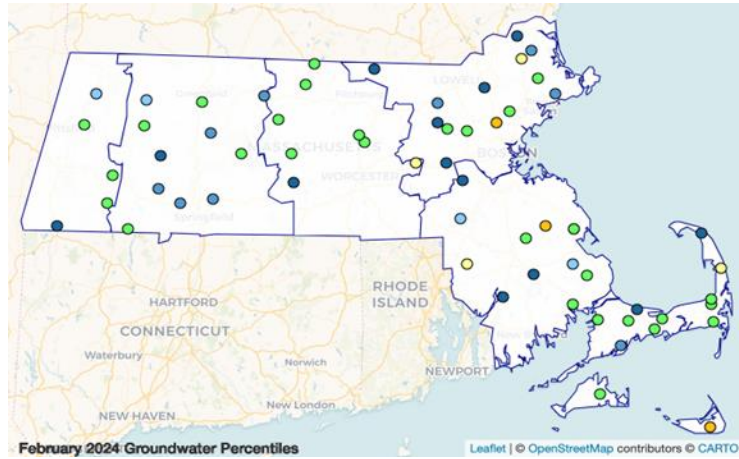
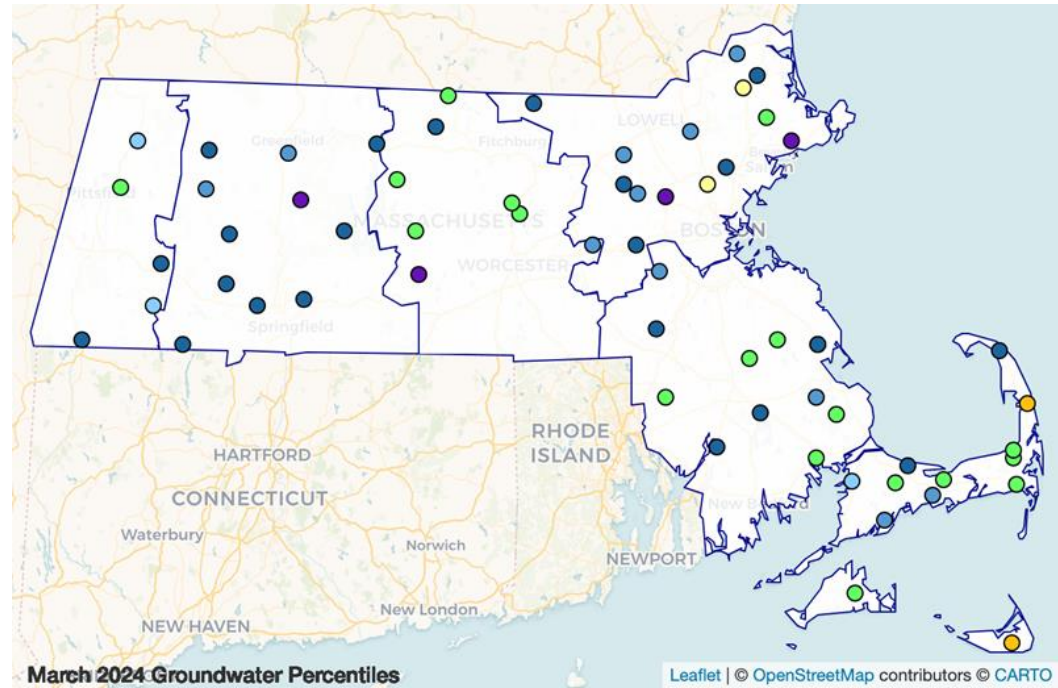
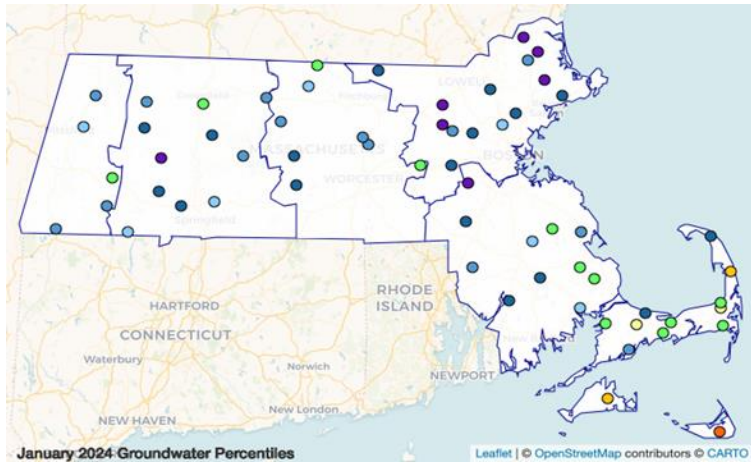
REGION	NUMBER OF SITES	1-mo *	2-mo	3-mo	6-mo	9-mo	12-mo	24-mo	36-mo *
WESTERN	5	97	85	97	94	97	96	87	96
CTRV	10	98	87	97	90	99	97	89	96
CENTRAL	16	97	87	97	92	100	99	96	98
NORTHEAST	18	96	81	95	88	99	98	83	94
SOUTHEAST	25	95	89	97	91	98	96	88	93
CAPE COD	6	86	72	90	49	81	79	78	88
ISLANDS	3	93	83	94	45	75	56	35	53

* 1- and 36-month SPI is for informational purposes only, not for drought determination. Of the 2- to 24-month look-back periods, the most relevant is selected each month depending on the phase of the drought - onset, during or recovery.

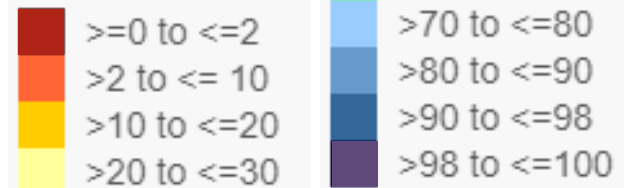
N/A: Not Available

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	0	0	2	77
CTRV	11	0	0	0	0	9	97
CENTRAL	8	0	0	0	0	2	69
NORTHEAST	14	0	0	0	2	7	91
SOUTHEAST	12	0	0	0	0	4	85
CAPE COD	11	0	0	1	0	2	57
ISLANDS	2	0	0	1	0	0	28

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

Drought Indices by Region, February 2024

Drought Index	Western	CT River Valley	Central	Northeast	Southeast	Cape	Islands
Precipitation (3 mos)	96	89	96	91	94	75	63
Streamflow	74	78	75	75	51	41	N/A
Groundwater	68	83	52	89	56	59	26
Lakes/ Impoundments	84	78	43	86	95	39	N/A
ET* 2-mos EDDI	N/A	N/A	N/A	N/A	N/A	N/A	N/A
KBDI**	N/A	N/A	N/A	N/A	N/A	N/A	N/A

<i>Declaration for February</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 1</i>
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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.*ET not reported, Nov-Mar, outside growing season **KBDI not reported, Nov-Mar, outside fire danger season.

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

Drought Indices by Region, March 2024

Drought Index	Western	CT River Valley	Central	Northeast	Southeast	Cape	Islands
Precipitation (6 mos)	94	90	92	88	91	49	45
Streamflow	91	91	90	87	91	54	N/A
Groundwater	77	97	69	91	85	57	28
Lakes/ Impoundments	100% full	93	78	89	98	55	N/A
ET* 2-mos EDDI	N/A	N/A	N/A	N/A	N/A	N/A	N/A
KBDI**	N/A	N/A	N/A	N/A	N/A	N/A	N/A

<i>Recommend (04/09 meeting)</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 0</i>	<i>Level 1</i>
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