

MASSACHUSETTS WATER RESOURCES COMMISSION

# HYDROLOGIC CONDITIONS IN MASSACHUSETTS

April  
2025

The Commonwealth of Massachusetts

*Maura T. Healey, Governor*

*Rebecca L. Tepper, Secretary  
Executive Office of Energy and Environmental Affairs*



# April 2025 HYDROLOGIC CONDITIONS

## SUMMARY OF CONDITIONS



- Monthly average temperatures were near to above normal.



- Precipitation was mostly normal.



- There was no snow cover at the end of April.
- The Evaporative Demand Drought Index was at elevated Index Severity Levels for both the 1-mos and 2-mos look-back periods. Keetch-Byram Drought Index values were in the normal range.



- Streamflow ranged from below normal to normal. The Western and CTRV regions is at Index Severity Level (ISL) 1, while Cape Cod Region is at Index Severity Level (ISL) 2. There was no reported flooding or flood warnings issued.



- Groundwater levels ranged from below normal to above normal. The Northeast and CTRV Regions are at ISL 1, and the Southeast, Cape Cod and Islands Regions are at ISL 2.



- At the end of April, nine of the 15 reporting lake and impoundment levels were below their 30th percentile. The CTRV, Central, Northeast, and Cape Cod Regions are at elevated ISLs.



- NOAA's May outlook shows chances leaning for above normal temperatures and equal chances for below-normal, normal, or above-normal precipitation.



- NOAA's 3-month outlook shows chances likely for above-normal temperatures and chances leaning for above-normal precipitation.



- Appendix II provides information on the Massachusetts Drought Management Plan (DMP) including ISL thresholds used in this report.

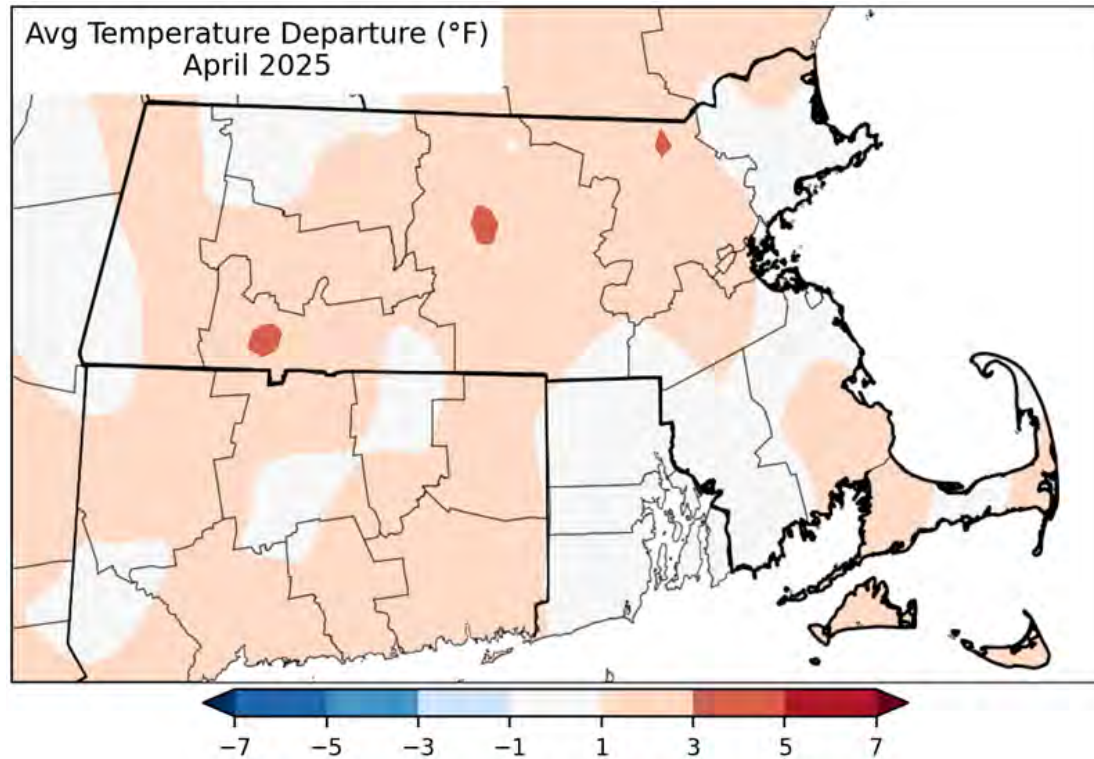


This report was prepared by the Massachusetts Department of Conservation and Recreation. Data may be preliminary. Analysis reflects automated calculations done 05/05/2025. Additional information, previous reports, and the Massachusetts Drought Dashboard with weekly updates to the drought indices can be found at: <https://www.mass.gov/drought-monitoring>

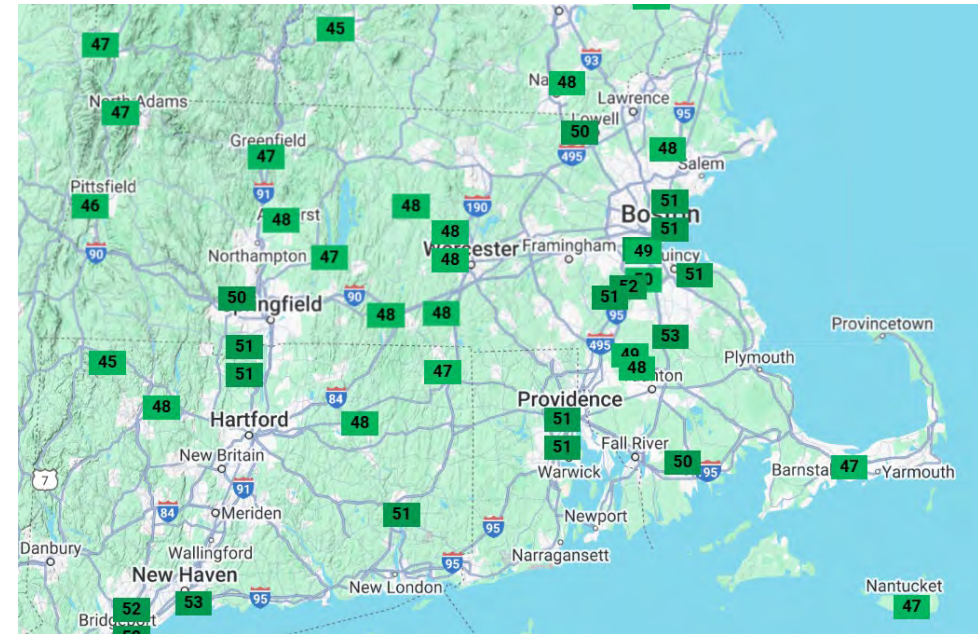


Monthly average temperatures were near to above normal.

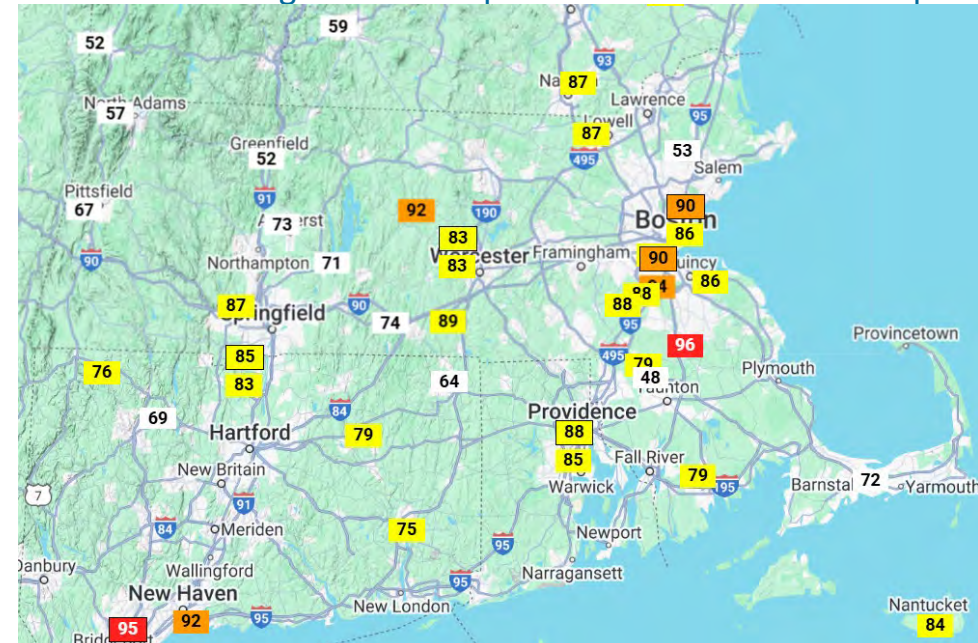
<http://www.nrcc.cornell.edu/regional/monthly/monthly.html>



Observed Average Mean Temperatures for Apr. 1<sup>st</sup>- 30<sup>th</sup>

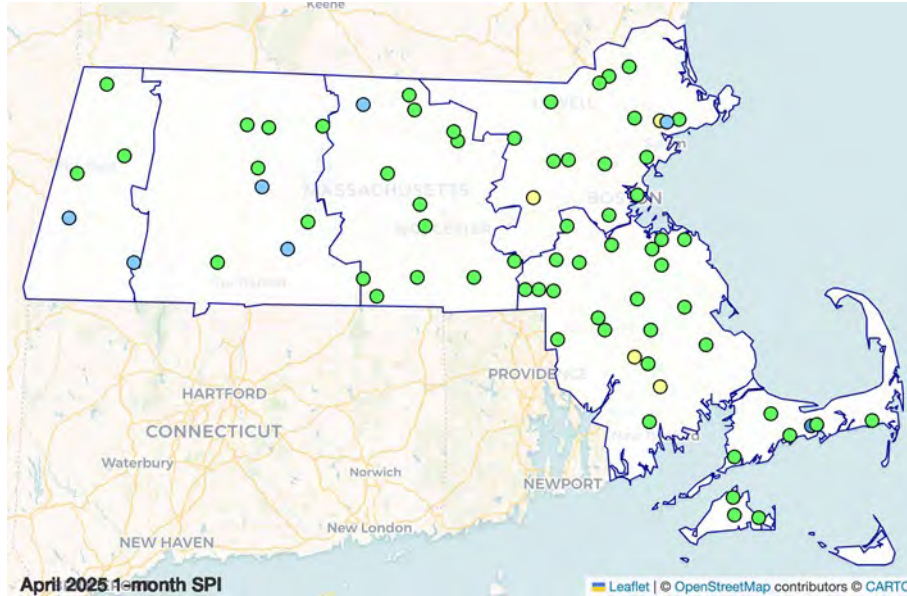


Observed Average Mean Temperature as Percentiles for Apr. 1<sup>st</sup> to 30<sup>th</sup>



## STANDARDIZED PRECIPITATION INDEX (SPI) AS A PERCENTILE

April precipitation was mostly normal. The 6-month look-backs are still showing deficits in the CTRV and Cape Cod Regions, and the 9-month look-backs are showing deficits in all Regions. In addition to the ISLs shown in the table below, Appendix I provides all the look-back periods.



● $\geq 0$ to $\leq 2$	● $> 2$ to $\leq 10$	● $> 10$ to $\leq 20$	● $> 20$ to $\leq 30$	● $> 30$ to $\leq 70$
● $> 70$ to $\leq 80$	● $> 80$ to $\leq 90$	● $> 90$ to $\leq 98$	● $> 98$ to $\leq 100$	

REGION	NUMBER OF SITES REPORTING	APRIL MONTHLY AVERAGE (IN)	DEPARTURE FROM HISTORICAL (IN)	SPI PERCENTILE 1-MONTH	SPI PERCENTILE 3-MONTH	SPI PERCENTILE 6-MONTH
WESTERN	5	3.90	0.33	65	60	45
CTRV	8	3.84	0.15	56	60	30
CENTRAL	13	3.94	-0.06	53	57	36
NORTHEAST	16	3.53	-0.25	46	52	33
SOUTHEAST	22	3.60	-0.58	44	42	36
CAPE COD	6	4.74	0.64	66	49	20
ISLANDS	3	4.02	0.04	65	69	38

SPI is the Standardized Precipitation Index used in the Drought Management Plan (DMP) expressed here as a percentile and represents the variation from long-term precipitation.

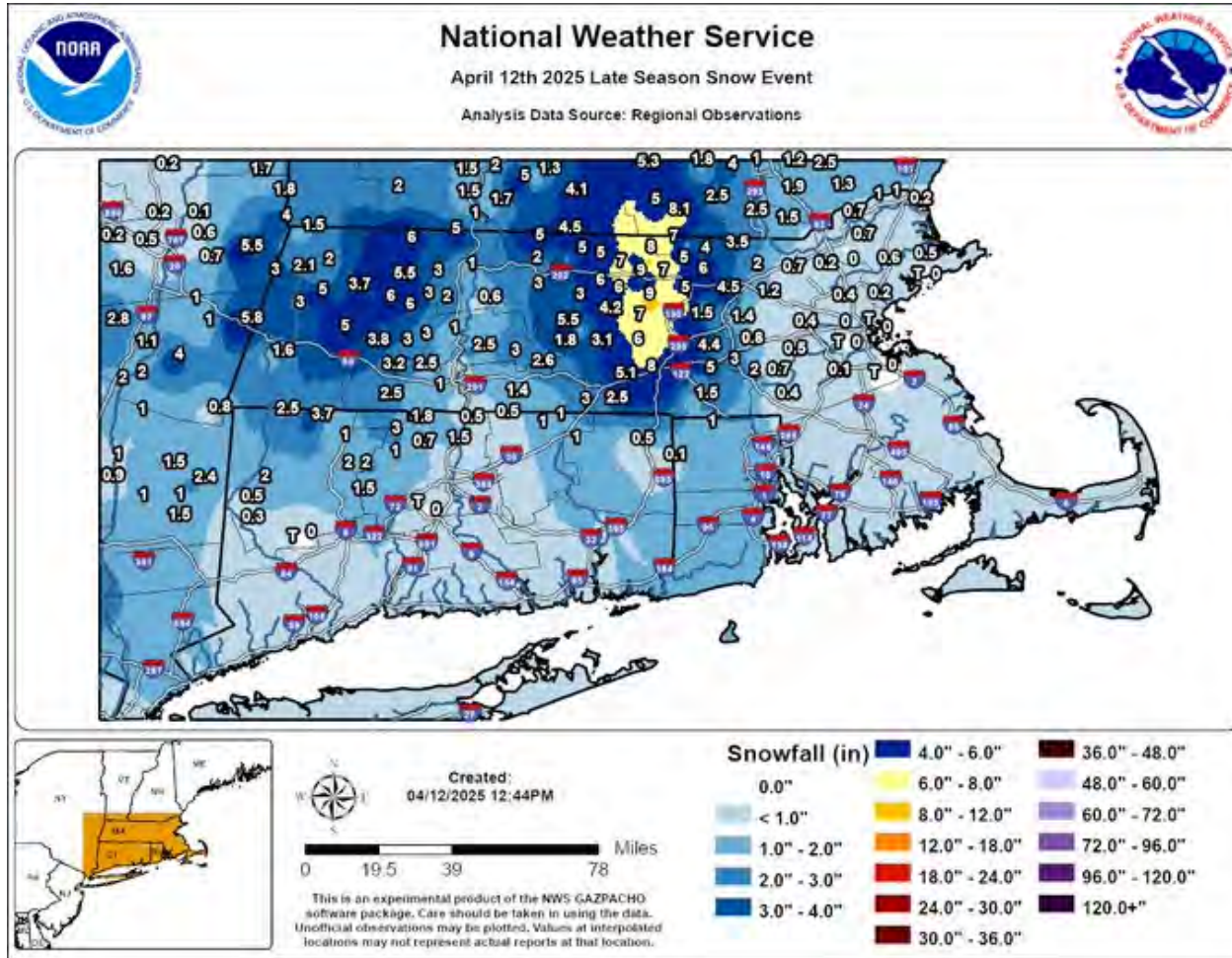
Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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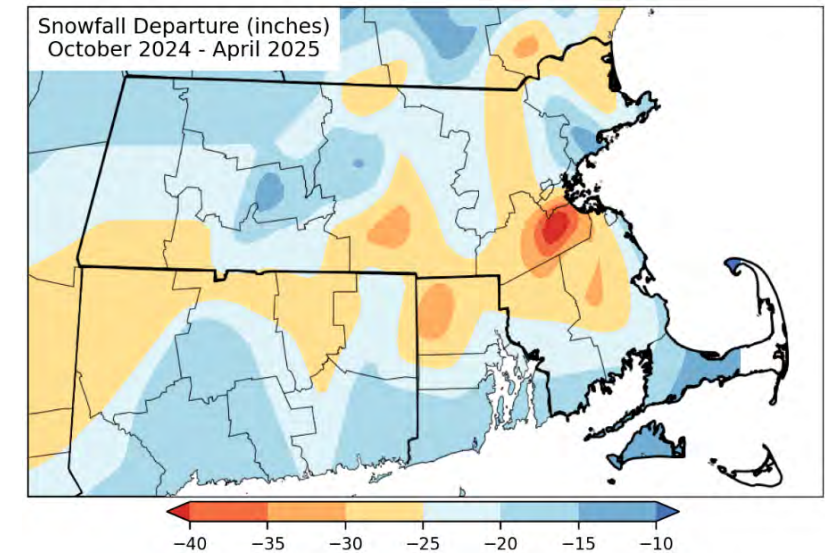
# SNOW COVER

At the end of April there was no snow cover, although there was a snowstorm on April 12<sup>th</sup> that brought up to 9-inches of snow in higher areas of the central part of the state. The season-to-date snowfall departure ranged from -10 to -40 inches.



## SEASON-TO-DATE SNOWFALL DEPARTURE

<http://www.nrcc.cornell.edu/regional/monthly/monthly.html>

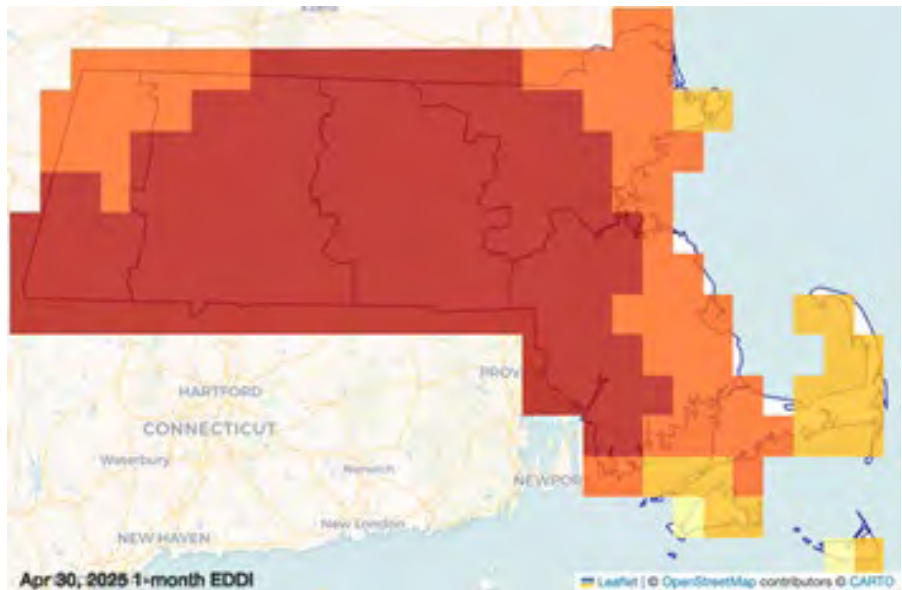


<https://x.com/NWSBoston/status/1911105465972302286>

## EVAPORATIVE DEMAND DROUGHT INDEX (EDDI)

As of April 30th, 2025, the 1-month and 2-month EDDI percentiles were at elevated ISLs for all Regions. However, given it is early in the season, the estimated values of evapotranspiration were only a few tenths of an inch.

1-month EDDI

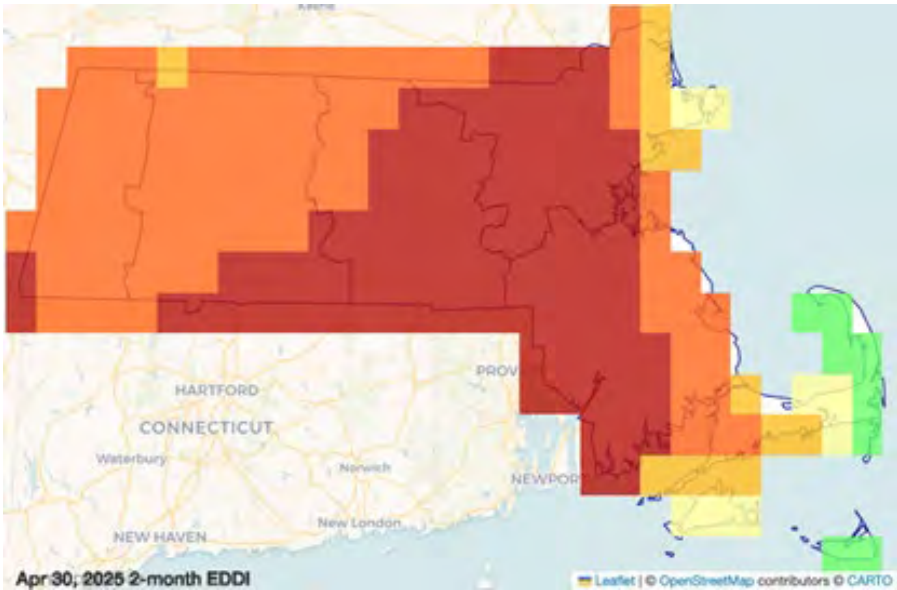


<span style="color: red;">●</span> $\geq 0$ to $\leq 2$	<span style="color: orange;">●</span> $> 2$ to $\leq 10$	<span style="color: yellow;">●</span> $> 10$ to $\leq 20$	<span style="color: lightyellow;">●</span> $> 20$ to $\leq 30$	<span style="color: green;">●</span> $> 30$ to $\leq 70$
<span style="color: lightblue;">●</span> $> 70$ to $\leq 80$	<span style="color: blue;">●</span> $> 80$ to $\leq 90$	<span style="color: darkblue;">●</span> $> 90$ to $\leq 98$	<span style="color: purple;">●</span> $> 98$ to $\leq 100$	

Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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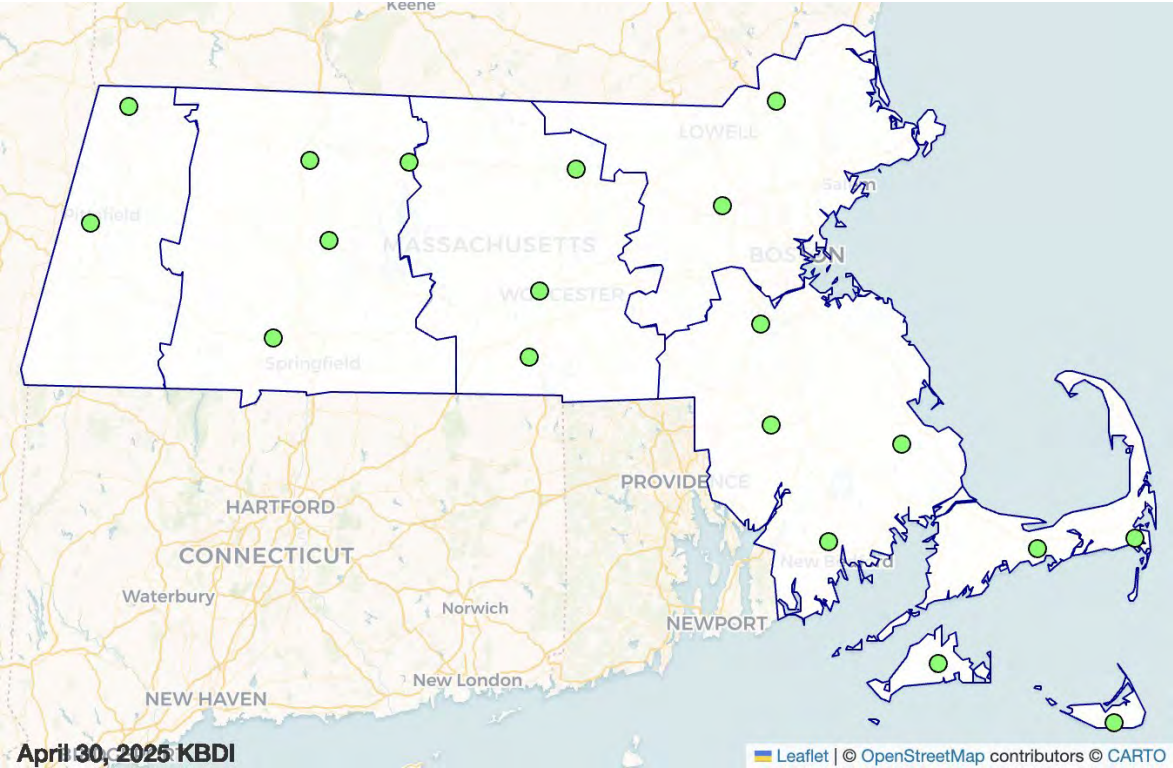
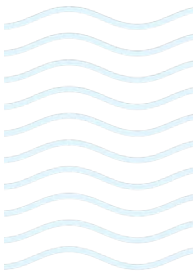
2-month EDDI



REGION	MEDIAN 2-MONTH EDDI (2025-04-30)
WESTERN	7
CTRV	7
CENTRAL	2
NORTHEAST	2
SOUTHEAST	2
CAPE COD	23
ISLANDS	24



At the end of April, the Keetch Byram Drought Index (KBDI) values were all in the normal range.



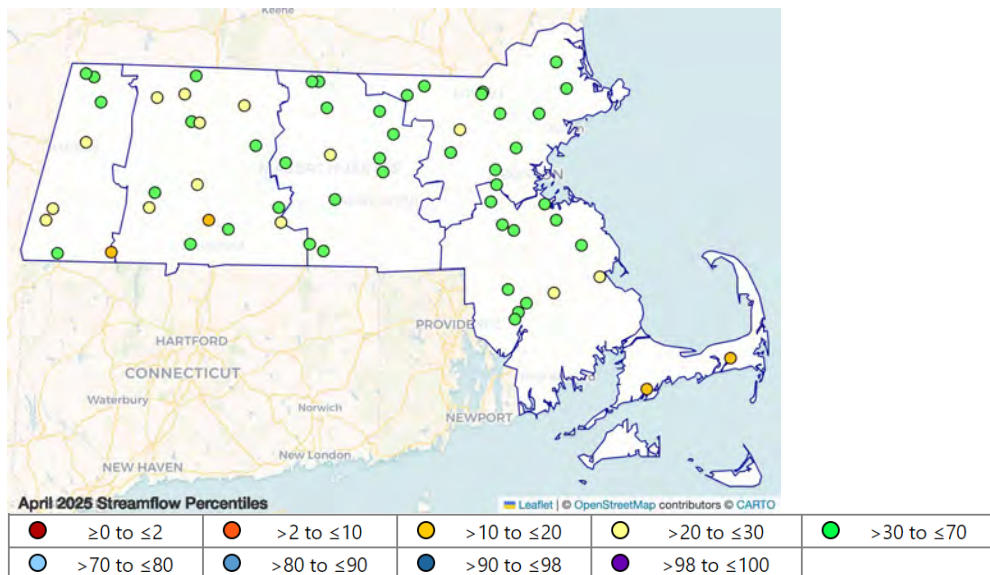
REGION	NUMBER OF SITES REPORTING	HIGHEST OF SITE VALUES
WESTERN	2	24
CTRV	4	71
CENTRAL	3	48
NORTHEAST	2	66
SOUTHEAST	4	100
CAPE COD	2	79
ISLANDS	2	21

Point Values - KBDI Range				
<div>●</div> $\geq 700$ to $\leq 800$	<div>●</div> $\geq 600$ to $< 700$	<div>●</div> $\geq 400$ to $< 600$	<div>●</div> $\geq 200$ to $< 400$	<div>●</div> $\geq 0$ to $< 200$

Index Severity Levels				
Level 0	Level 1	Level 2	Level 3	Level 4

April streamflow ranged from below normal to normal. The Western and CTRV Regions are at ISL 1 and the Cape Cod Region is at ISL 2.

## MEDIAN MONTHLY STREAMFLOW PERCENTILES COMPARED TO HISTORICAL VALUES



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

REGION	NUMBER OF GAGES REPORTING	NUMBER OF GAGES BELOW NORMAL $\geq 0$ TO $\leq 30$ PERCENTILE	NUMBER OF GAGES NORMAL $> 30$ TO $\leq 70$ PERCENTILE	NUMBER OF GAGES ABOVE NORMAL $> 70$ TO $\leq 100$ PERCENTILE	MEDIAN OF INDIVIDUAL GAGE PERCENTILES
WESTERN	8	4	4	0	29
CTRV	15	8	7	0	30
CENTRAL	12	1	11	0	42
NORTHEAST	13	1	12	0	35
SOUTHEAST	12	2	10	0	36
CAPE COD	2	2	0	0	14

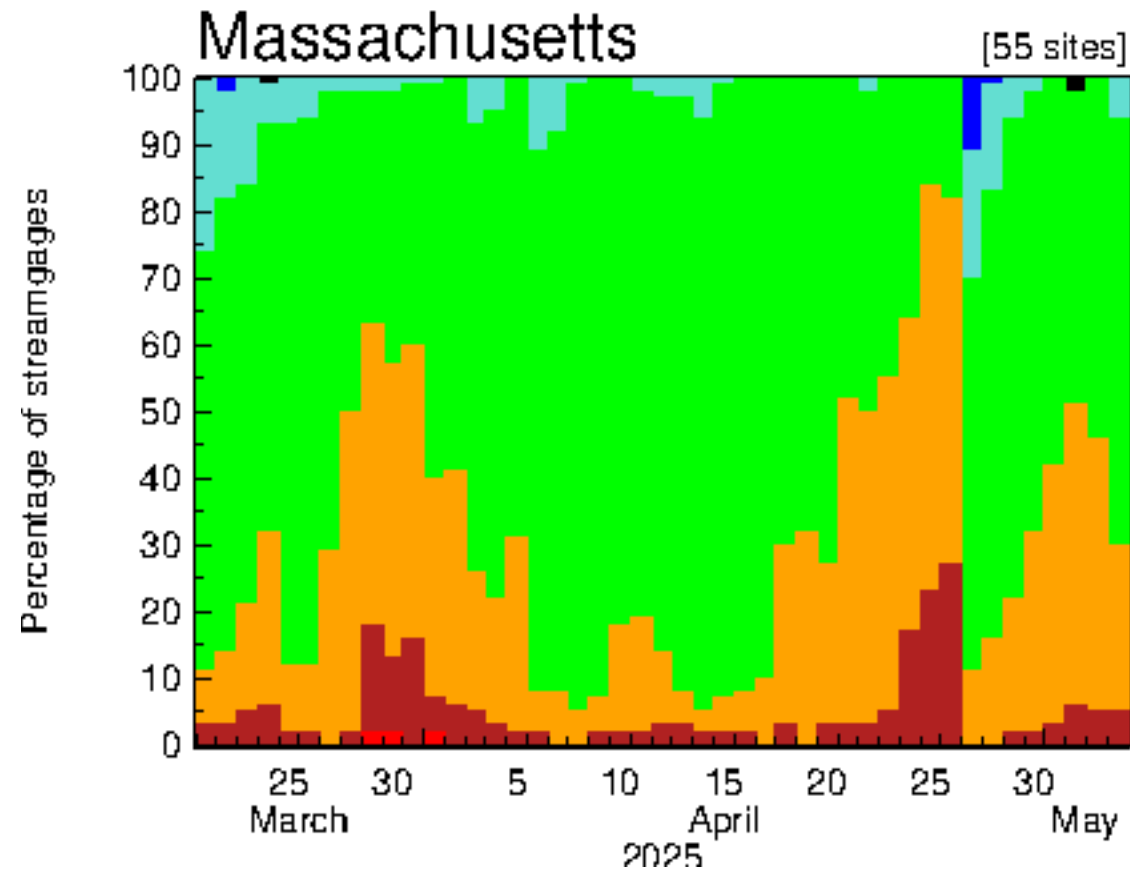
REGION	NUMBER OF GAGES IN NETWORK
WESTERN	8
CTRV	15
CENTRAL	13
NORTHEAST	13
SOUTHEAST	12
CAPE COD	2

Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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# USGS TIME SERIES OF THE PERCENT OF GAGES AT THEIR RESPECTIVE PERCENTILE FLOWS FOR AVERAGE DAILY STREAMFLOWS COMPARED TO HISTORICAL VALUES



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

<https://waterdata.usgs.gov/nwis/sw>

The Boston/Norton and Albany NWS E-5 Monthly Reports of Hydrologic Conditions did not indicate river flooding at forecast points.

There were no NWS flood warnings or local storm flooding reports.

<https://mesonet.agron.iastate.edu/vtec/search.php#eventsbypoint/-93.6530/41.5300>

[water.noaa.gov](https://water.noaa.gov)

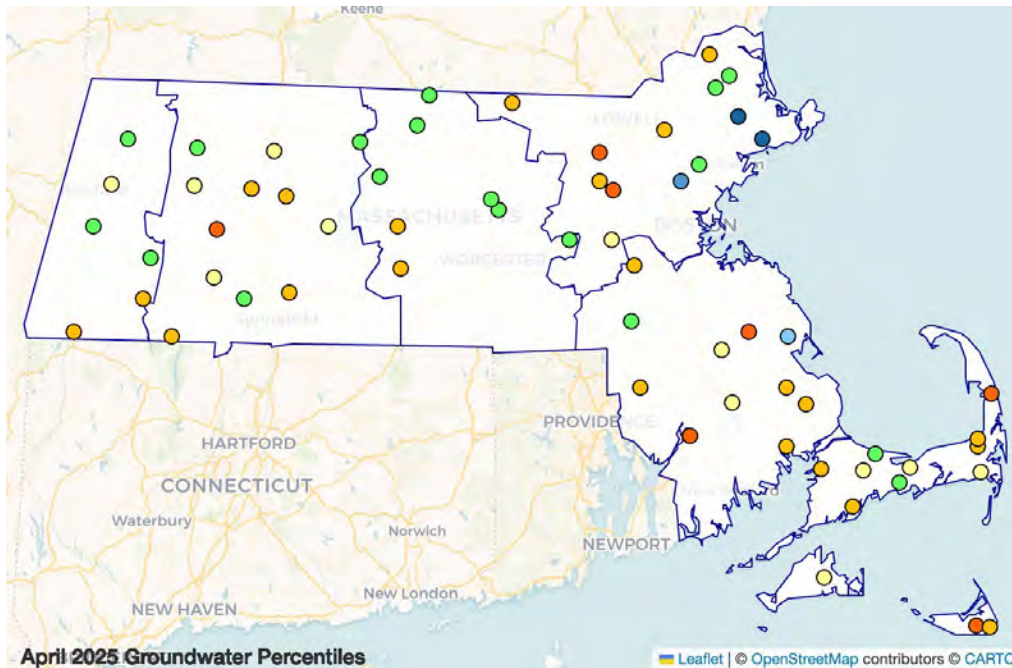


Image: Courtesy of NASA/JPL-Caltech

*For real-time flood forecasts refer to the Northeast River Forecast Center: <https://www.weather.gov/nerfc/>*

April groundwater levels ranged from below normal to above normal. The CTRV and Northeast Regions are at ISL 1 and the Southeast, Cape Cod, and Islands Regions are at ISL 2.

## END OF MONTH GROUNDWATER COMPARED TO HISTORICAL IN THE CLIMATE RESPONSE NETWORK WELLS



● $\geq 0$ to $\leq 2$	● $> 2$ to $\leq 10$	● $> 10$ to $\leq 20$	● $> 20$ to $\leq 30$	● $> 30$ to $\leq 70$
● $> 70$ to $\leq 80$	● $> 80$ to $\leq 90$	● $> 90$ to $\leq 98$	● $> 98$ to $\leq 100$	

REGION	NUMBER OF WELLS REPORTING	NUMBER OF WELLS <u>BELOW</u> NORMAL $\geq 0$ TO $\leq 30$ PERCENTILE	NUMBER OF WELLS <u>NORMAL</u> $> 30$ TO $\leq 70$ PERCENTILE	NUMBER OF WELLS <u>ABOVE</u> NORMAL $> 70$ TO $\leq 100$ PERCENTILE	MEDIAN OF INDIVIDUAL WELL PERCENTILES
WESTERN	6	3	3	0	31
CTRV	12	9	3	0	24
CENTRAL	8	2	6	0	39
NORTHEAST	13	7	3	3	28
SOUTHEAST	12	9	2	1	20
CAPE COD	10	8	2	0	20
ISLANDS	3	3	0	0	18

Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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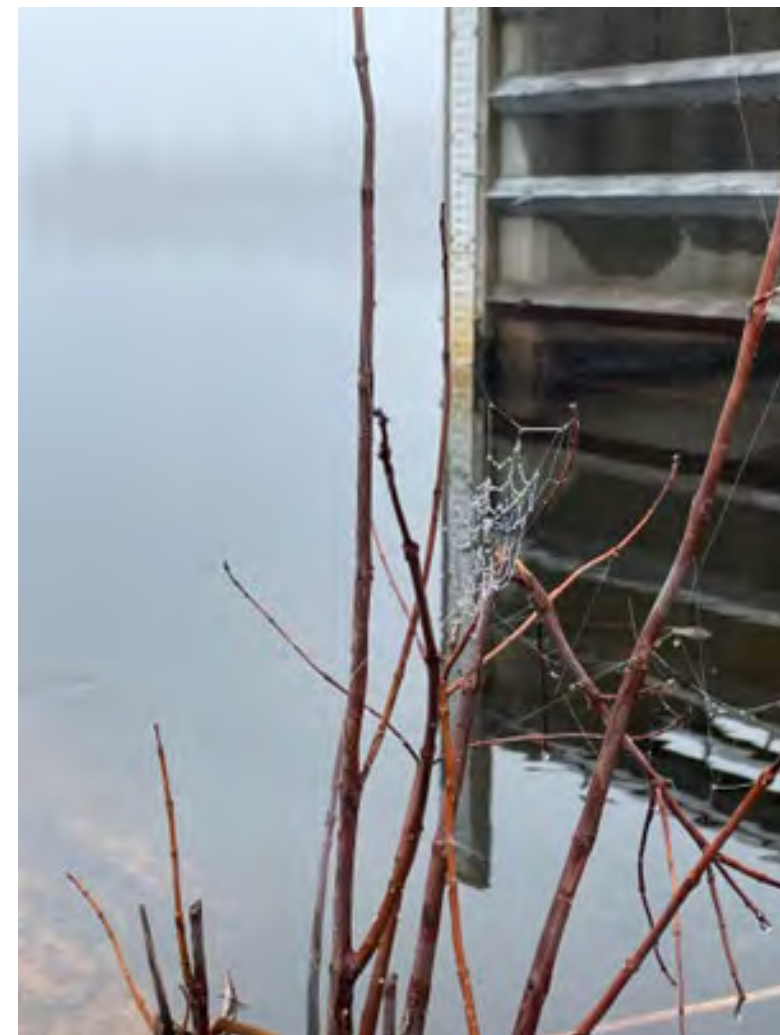
At the end of April, nine of the 15 reporting lake and impoundment sites were below their 30th percentile. The CTRV, Central, Northeast, and Cape Cod Regions are at elevated ISLs.

REGION	NUMBER OF SITES REPORTING	MEDIAN OF INDIVIDUAL PERCENTILES OR PERCENT FULL
WESTERN	2	100% full
CTRV	2	19th
CENTRAL	3	23rd
NORTHEAST	5	10th
SOUTHEAST	2	34th
CAPE COD	1	23rd

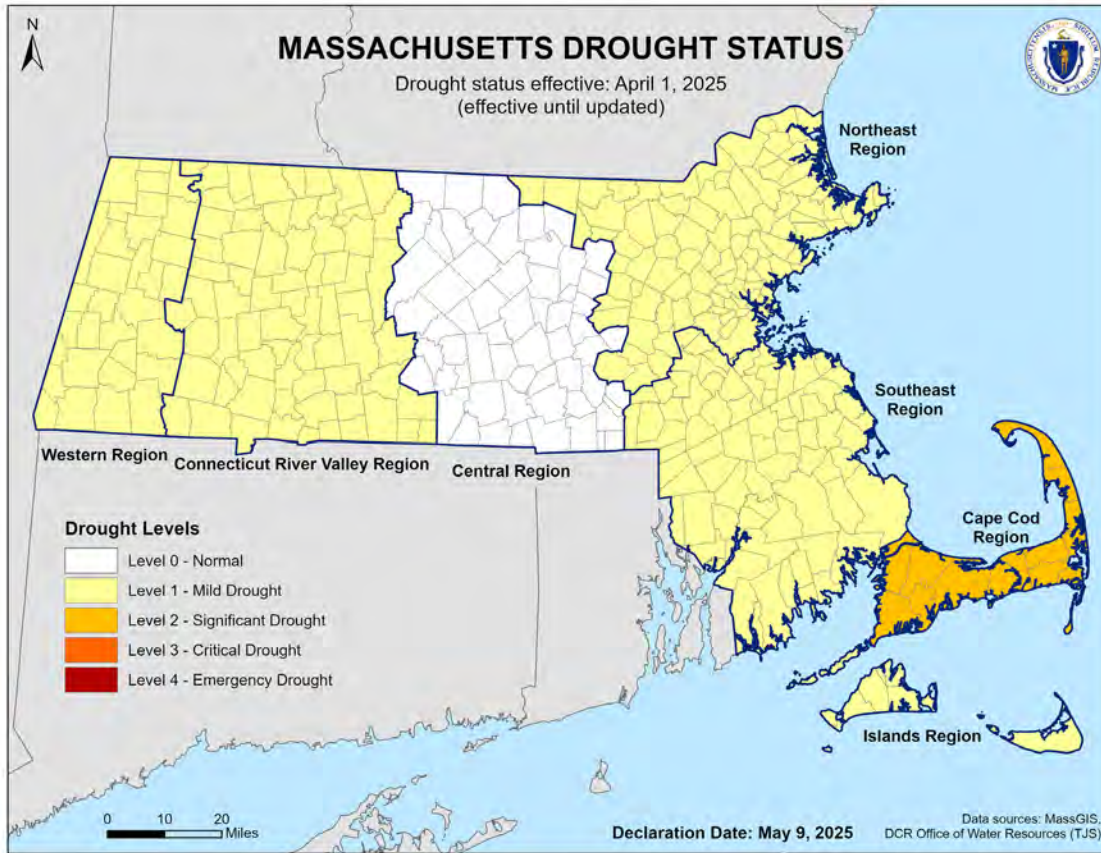
DMP Index Severity Levels do not necessarily reflect water supply status.

Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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# MASSACHUSETTS DROUGHT STATUS



On May 9, 2025, Massachusetts Energy and Environmental Affairs (EEA) Secretary Rebecca L. Tepper declared that starting from April 1, 2025, The Central Region is at Level 0 – Normal, the Western, Connecticut River Valley, Northeast, Southeast, and Islands Regions are at Level 1 – Mild Drought, and the Cape Cod Region is at Level 2 – Significant Drought. This status remains in effect until further updated.

Index Severity Levels



Drought Indices by Region April 2025

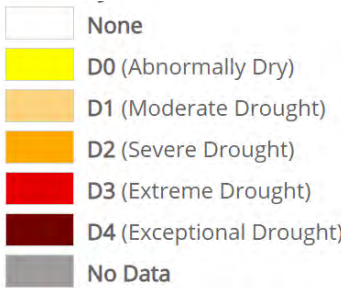
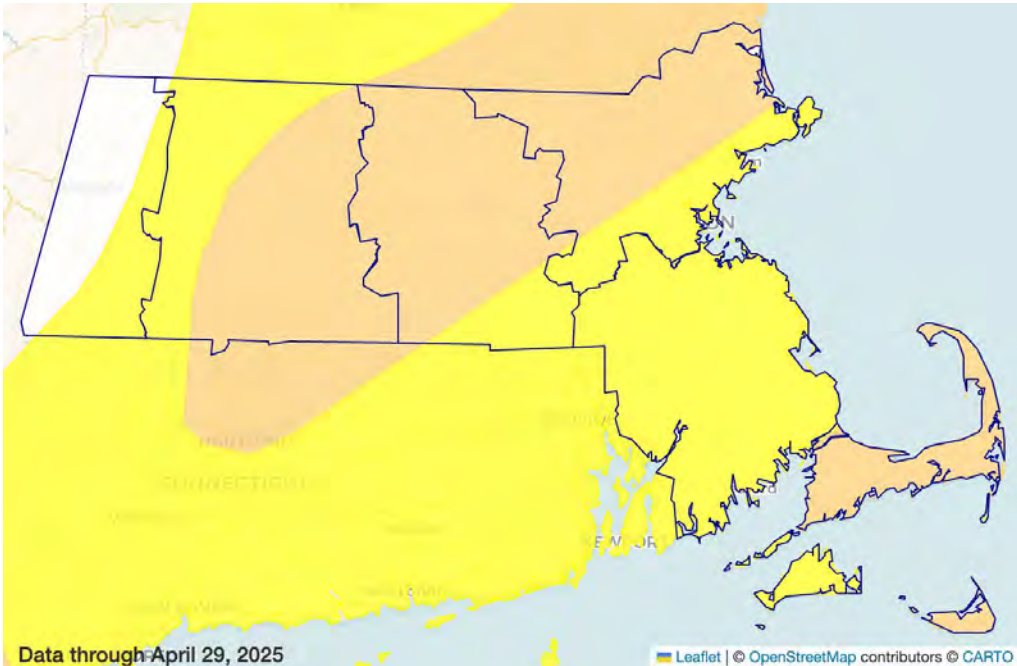
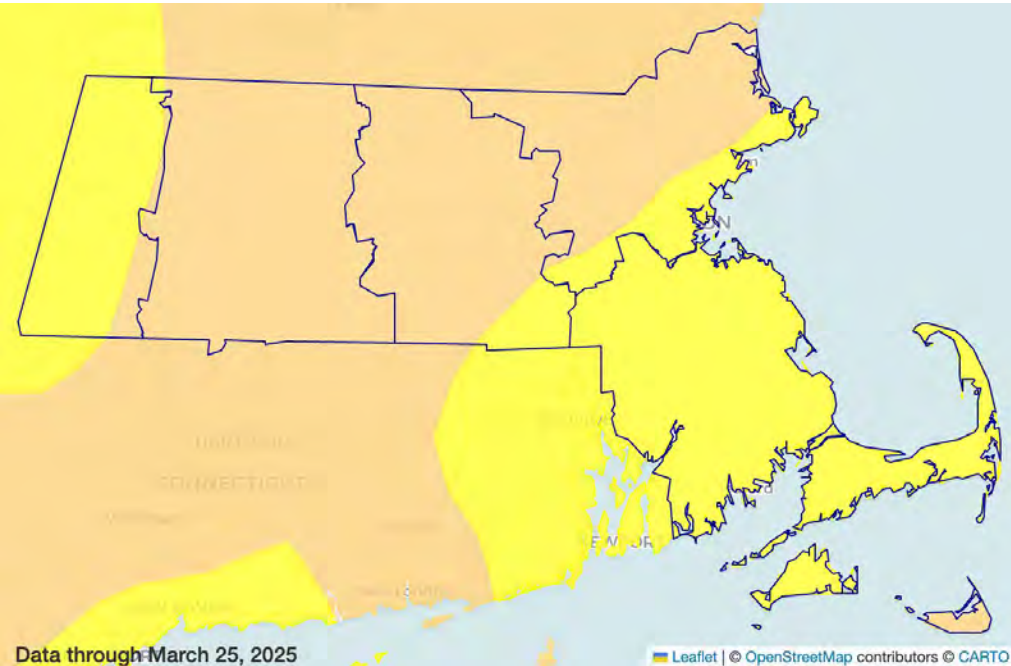
Drought Index	Western	CT River Valley	Central	Northeast	Southeast	Cape	Islands
Precipitation (6-mos)	45	29	36	33	37	20	38
Precipitation (9-mos)	22	9	8	17	12	14	22
Streamflow	29	30	42	35	36	14	N/A
Groundwater	31	24	39	28	20	20	18
Lakes/ Impoundments	100%	19	23	10	34	23	N/A
ET*	7	7	2	2	2	23	24
KBDI**	<200	<200	<200	<200	<200	<200	<200



# U.S. DROUGHT MONITOR (USDM)

At the end of April, the USDM showed areas of D1 (Moderate Drought), D0 (Abnormally Dry) and a small area in the Western Region as normal.

USDM maps are produced by the National Drought Mitigation Center (NDMC). For methods, weekly updates, and past maps see: <https://droughtmonitor.unl.edu>



USDM	MA DMP
D0	= L1
D1	= L2
D2,D3	= L3
D4	= L4

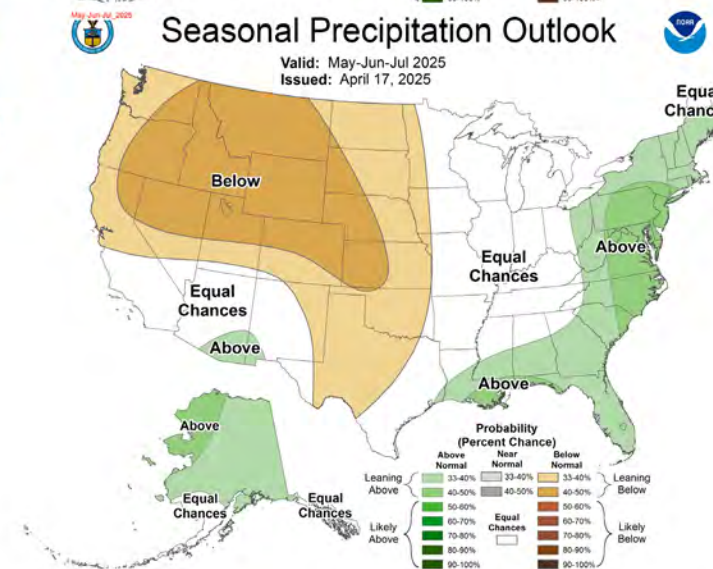
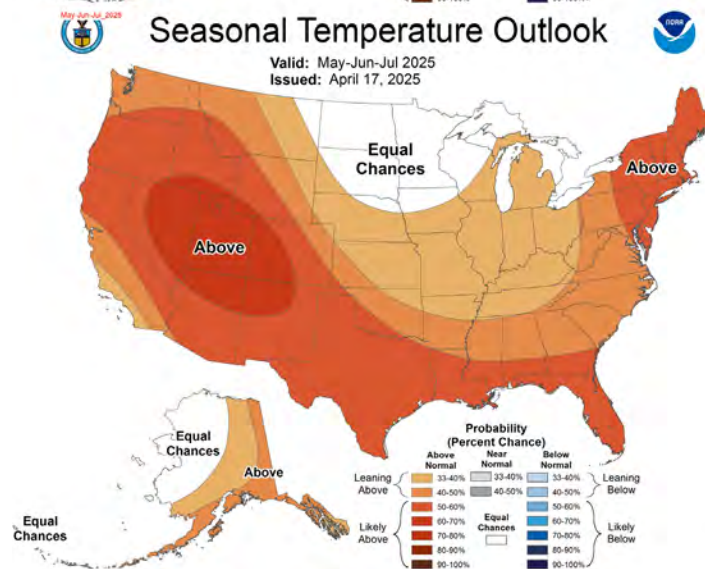
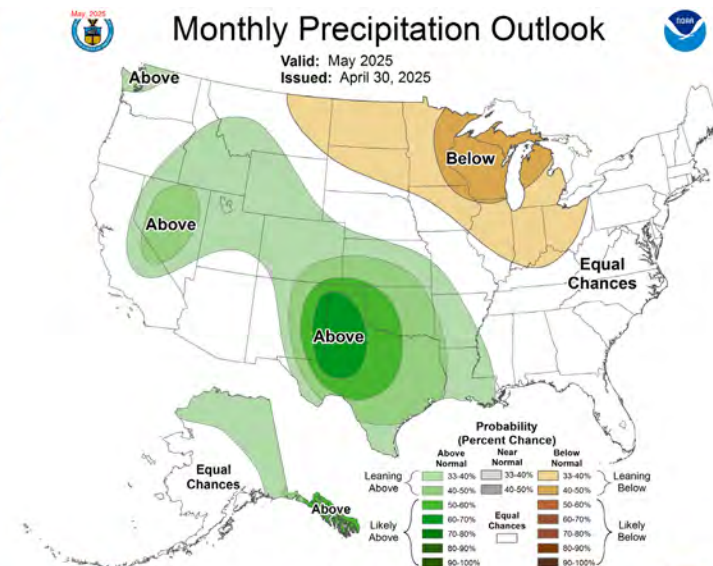
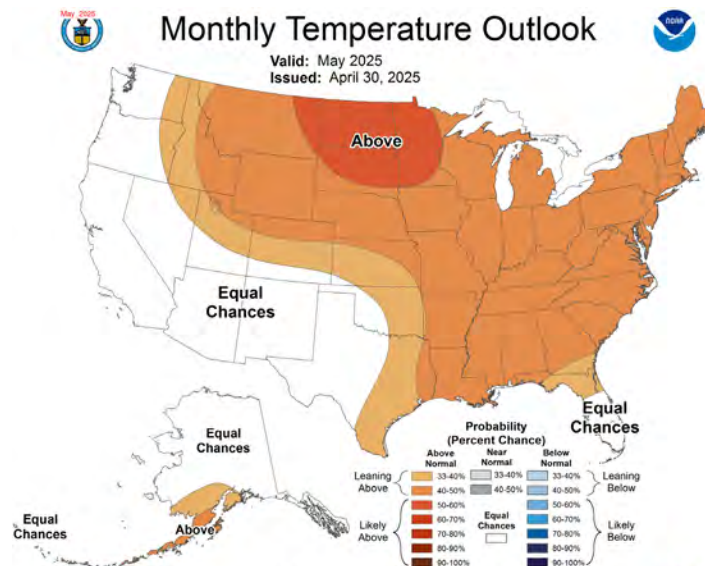


# TEMPERATURE AND PRECIPITATION OUTLOOK

**May:** The monthly outlook issued 4/30 shows chances leaning for above normal temperatures and equal chances for above-normal, normal, or below-normal precipitation.

**May through July:** The seasonal outlook issued 4/17 shows chances likely for above-normal temperatures and chances leaning for above-normal precipitation.

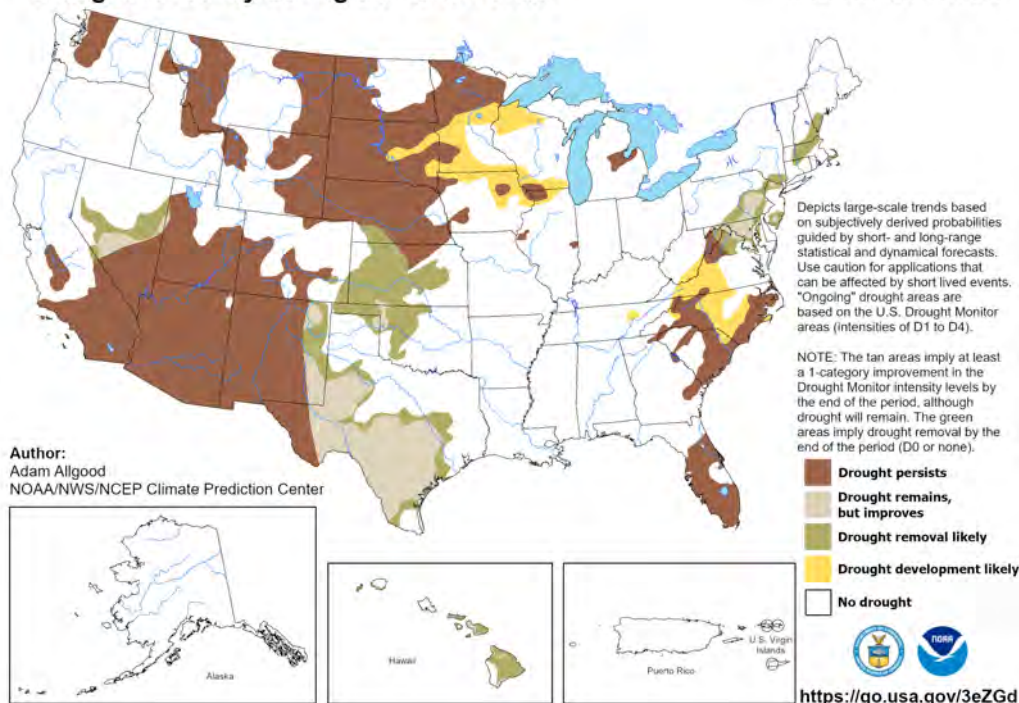
<https://www.cpc.ncep.noaa.gov/>



## U.S. Monthly Drought Outlook

### Drought Tendency During the Valid Period

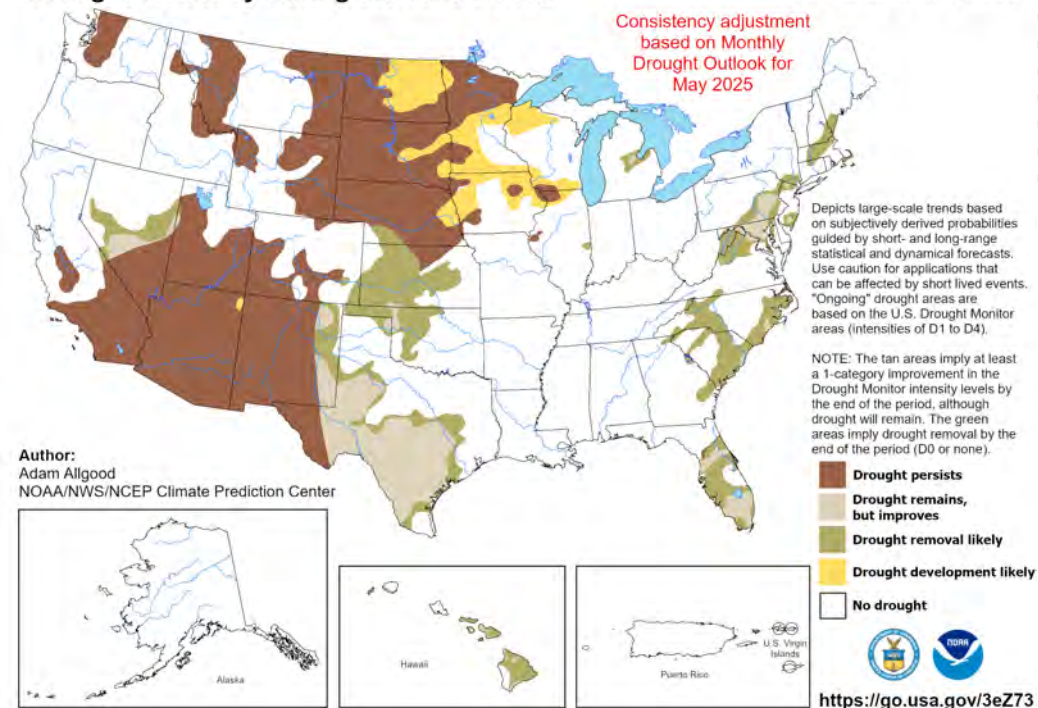
Valid for May 2025  
Released April 30, 2025



## U.S. Seasonal Drought Outlook

### Drought Tendency During the Valid Period

Valid for May 1 - July 31, 2025  
Released April 30, 2025



## MONTHLY AND SEASONAL DROUGHT OUTLOOK

Both the monthly and seasonal drought outlooks released 4/30 shows drought removal likely in central and northeastern parts of the state as well as some of Cape Cod and Nantucket.

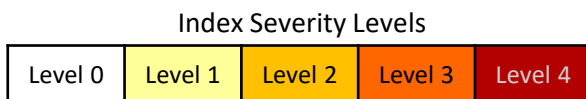
<http://www.cpc.ncep.noaa.gov/products/Drought>



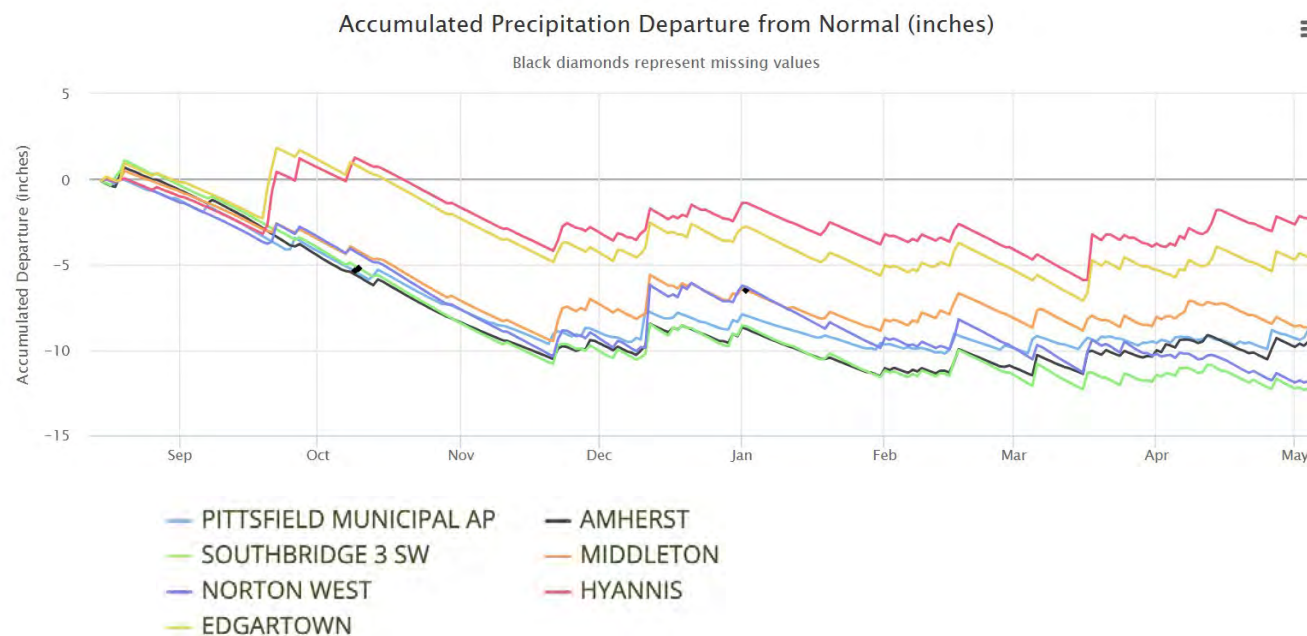


# ADDITIONAL PRECIPITATION DATA

## Standardized Precipitation Index— April 2025 as percentiles



REGION	NUMBER OF SITES	1-mo	2-mo	3-mo	6-mo	9-mo	12-mo	24-mo	36-mo
WESTERN	5	65	64	60	45	22	22	69	56
CTRV	8	56	62	60	30	10	16	74	61
CENTRAL	13	53	55	57	36	8	14	86	80
NORTHEAST	16	46	49	52	33	17	12	78	60
SOUTHEAST	22	44	45	42	36	12	19	79	70
CAPE COD	6	66	60	49	20	14	18	38	42
ISLANDS	3	65	69	69	38	22	39	37	48



## Accumulated Precipitation Departure from 30-Year Normals in Inches, starting mid-August

Graph does not consider starting condition's wetness/dryness; does not show summer heat waves with high evapotranspiration; and shows only one station per Drought Region. <https://xmacis.rcc-acis.org/>



## ADDITIONAL PRECIPITATION DATA (CONT.)

## Percent of Average Historical Precipitation—April 2025

REGION	NUMBER OF SITES REPORTING	HISTORICAL AVERAGE	APRIL AVERAGE (IN)	DEPARTURE FROM HISTORICAL AVERAGE (IN)	PERCENT OF NORMAL
WESTERN	5	3.57	3.90	0.33	109%
CTRV	8	3.69	3.84	0.15	104%
CENTRAL	13	4.00	3.94	-0.06	98%
NORTHEAST	16	3.78	3.53	-0.25	93%
SOUTHEAST	22	4.18	3.60	-0.58	86%
CAPE COD	6	4.10	4.74	0.64	116%
ISLANDS	3	3.98	4.02	0.04	101%

# DROUGHT MANAGEMENT PLAN INFORMATION

The Massachusetts Drought Management Plan (DMP) can be found at <https://www.mass.gov/doc/massachusetts-drought-management-plan/download>. The document provides details on the Drought Indices, how Drought Levels are determined, and actions associated with each drought level.

## Index Severity Levels (Section 3.4 of the DMP)

SEVERITY LEVEL	Percentiles for: STANDARDIZED PRECIPITATION INDEX (SPI), STREAMFLOW, LAKES AND IMPOUNDMENTS, GROUNDWATER, EVAPOTRANSPIRATION	KEETCH-BRYAM DROUGHT INDEX (KBDI)
0	> 30th percentile	< 200
1	≤ 30 and > 20	200-400
2	≤ 20 and > 10	400-600
3	≤ 10 and > 2	600-700
4	≤ 2	700-800

## Drought Levels (Section 3.1 of the DMP)

- Level 0** Normal
- Level 1** Mild Drought
- Level 2** Significant Drought
- Level 3** Critical Drought
- Level 4** Emergency Drought



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**Massachusetts Water Resources Commission**

**Executive Office of Energy and Environmental Affairs**

[www.mass.gov/conservemawater](http://www.mass.gov/conservemawater)

[www.mass.gov/drought-management](http://www.mass.gov/drought-management)