

MASSACHUSETTS WATER RESOURCES COMMISSION

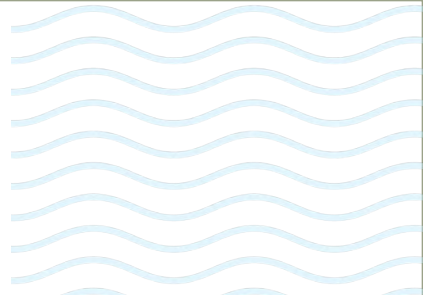
HYDROLOGIC CONDITIONS IN MASSACHUSETTS

MARCH
2025

The Commonwealth of Massachusetts

Maura T. Healey, Governor

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



MARCH 2025 HYDROLOGIC CONDITIONS

SUMMARY OF CONDITIONS



- Monthly average temperatures were above normal.
- Precipitation was mostly normal.



- There were very small traces of snow cover at the end of March in some higher elevation areas.



- The Evaporative Demand Drought Index and Keetch-Byram Drought Index are not reported in March.
- Streamflow ranged from below normal to above normal. The Cape Cod Region is the only elevated region at Index Severity Level (ISL) 3. There was minor flooding on Hoosic and Connecticut Rivers.



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



- Lake and impoundment levels were mostly below normal. All Regions are at elevated ISLs.



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



- NOAA's 3-month outlook shows chances leaning for above-normal temperatures and equal chances for above-normal, normal, or below-normal precipitation.



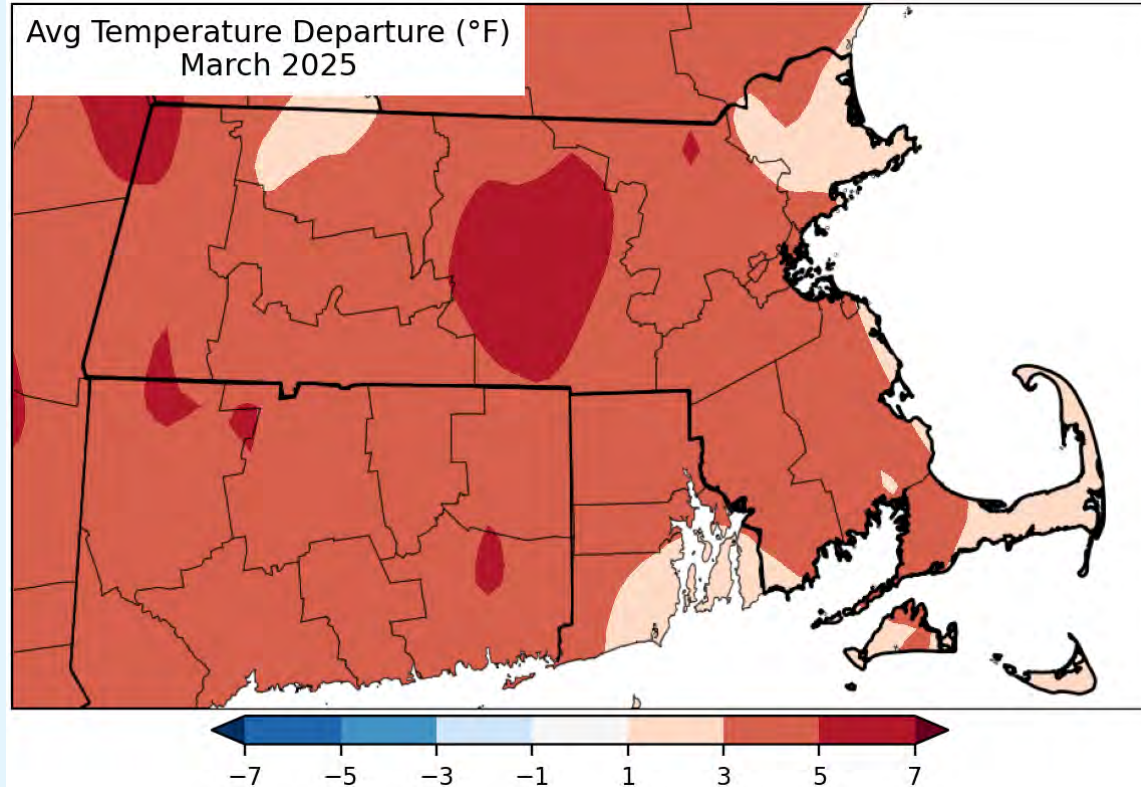
- Appendix II provides information on the Massachusetts Drought Management Plan (DMP) including ISL thresholds used in this report.



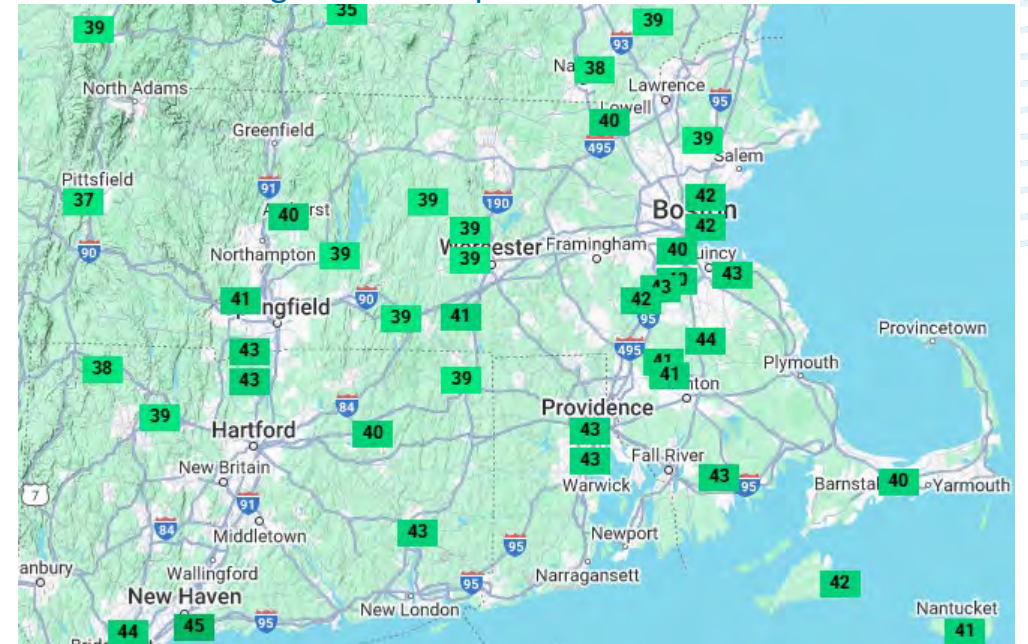
This report was prepared by the Massachusetts Department of Conservation and Recreation. Data may be preliminary. Analysis reflects automated calculations done 04/07/2025. Additional information, previous reports, and the Massachusetts Drought Dashboard with weekly updates to the drought indices can be found at: <https://www.mass.gov/drought-monitoring>

Monthly average temperatures were above normal.

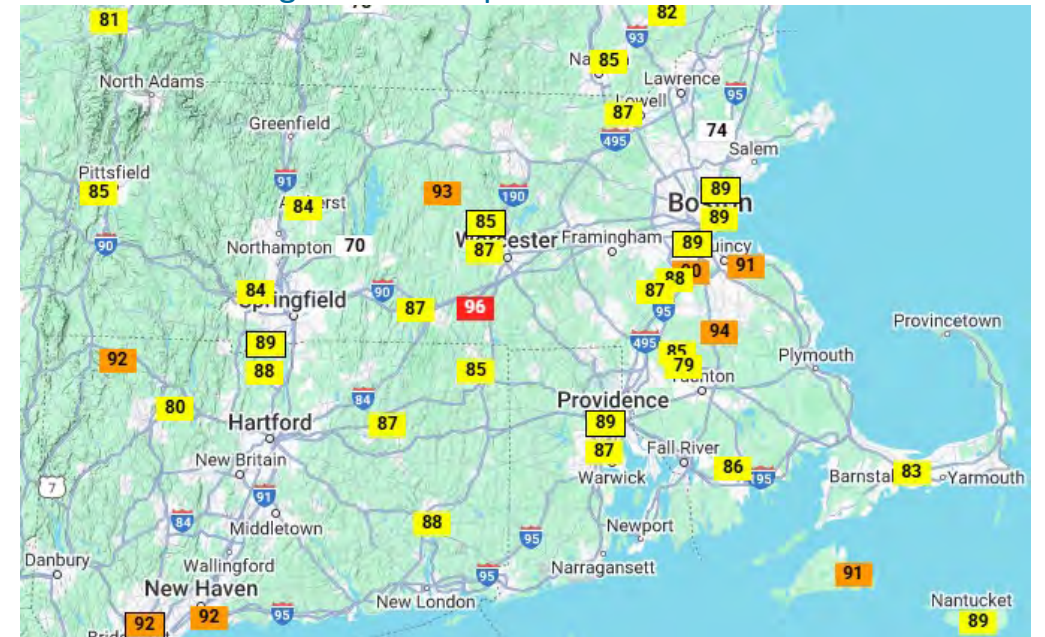
<http://www.nrcc.cornell.edu/regional/monthly/monthly.html>



Observed Average Mean Temperatures for Mar. 1st- 30th

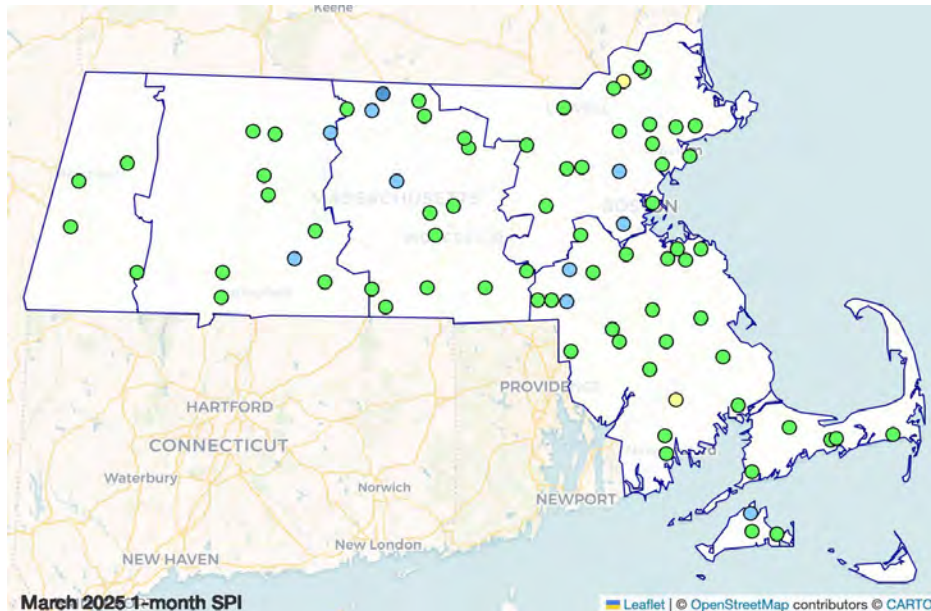


Observed Average Mean Temperature as Percentiles for Mar. 1st to 30th



STANDARDIZED PRECIPITATION INDEX (SPI) AS A PERCENTILE

March precipitation was mostly normal. The 6-month look-backs for all Regions show deficits. In addition to the ISLs shown in the table below, Appendix I provides all the look-back periods.



● ≥ 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	

REGION	NUMBER OF SITES REPORTING	MARCH MONTHLY AVERAGE (IN)	DEPARTURE FROM HISTORICAL (IN)	SPI PERCENTILE 1-MONTH	SPI PERCENTILE 3-MONTH	SPI PERCENTILE 6-MONTH
WESTERN	4	3.13	-0.21	50	29	20
CTRV	10	4.06	0.41	67	28	10
CENTRAL	16	4.21	0.26	63	32	12
NORTHEAST	19	3.74	-0.22	50	33	14
SOUTHEAST	23	4.38	-0.12	53	26	16
CAPE COD	5	4.23	-0.10	55	17	9
ISLANDS	3	4.72	0.56	64	30	26

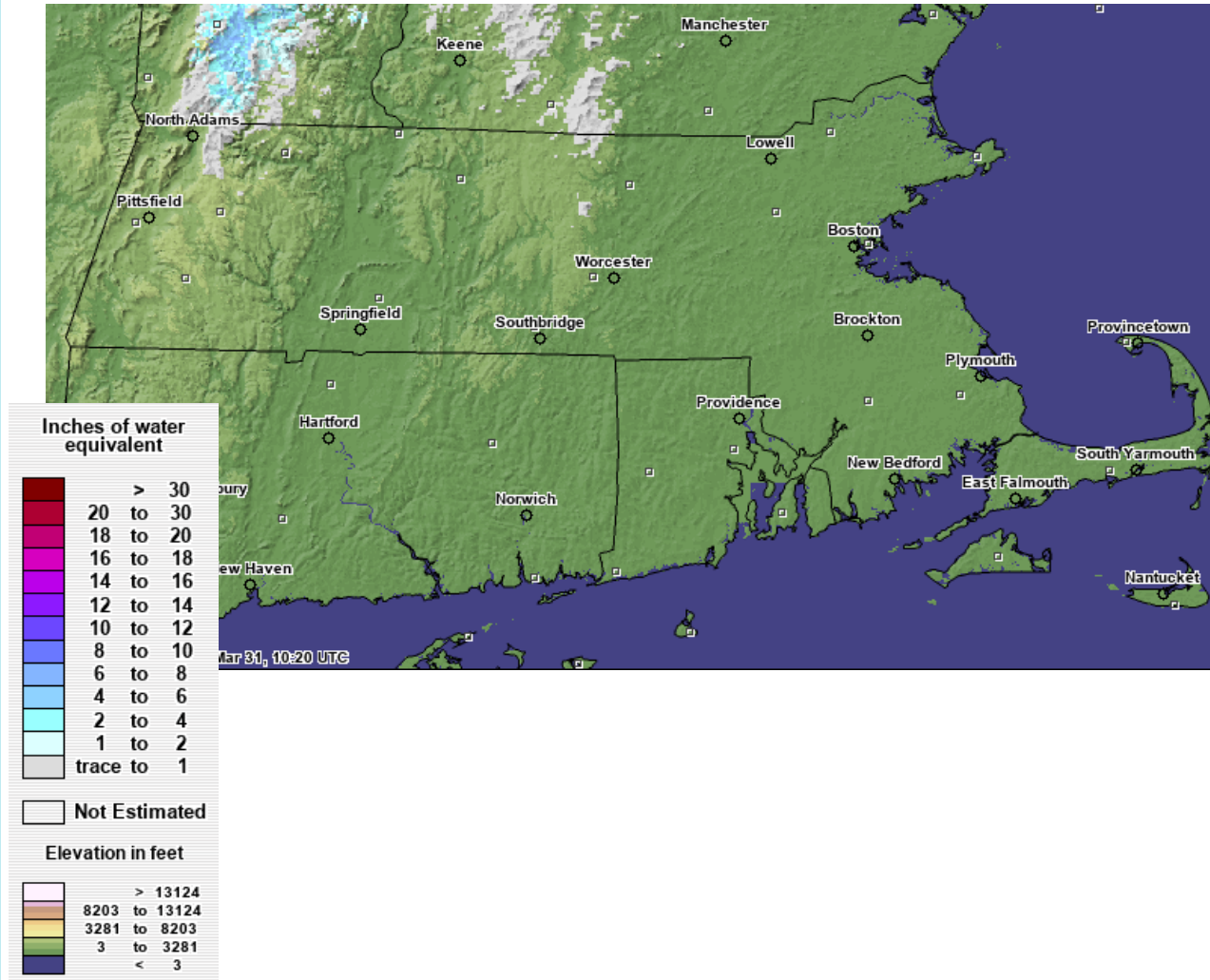
SPI is the Standardized Precipitation Index used in the Drought Management Plan (DMP) expressed here as a percentile and represents the variation from long-term precipitation.

Index Severity Levels

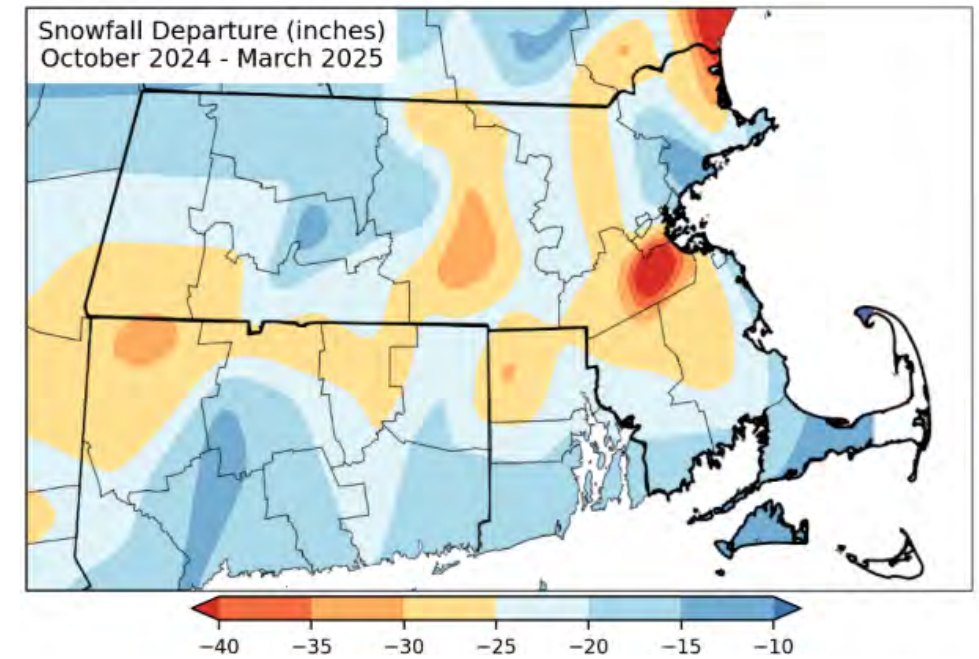
Level 0	Level 1	Level 2	Level 3	Level 4
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SNOW COVER

At the end of March there were only very small traces of snow in some higher elevation areas. The season-to-date snowfall departure ranged from -10 to -40 inches.



SEASON-TO-DATE SNOWFALL DEPARTURE

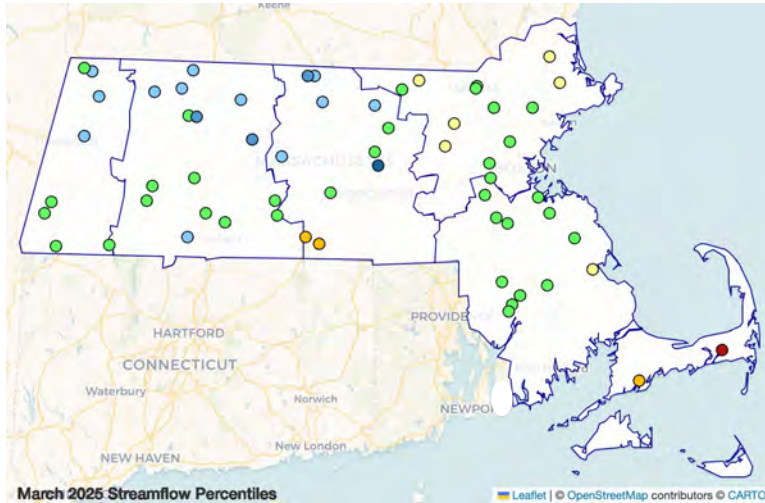


<http://www.nrcc.cornell.edu/regional/monthly/monthly.html>



March streamflow ranged from below normal to above normal. Cape Cod is the only Region at an elevated ISL.

MEDIAN MONTHLY STREAMFLOW PERCENTILES COMPARED TO HISTORICAL VALUES



● ≥ 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	

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

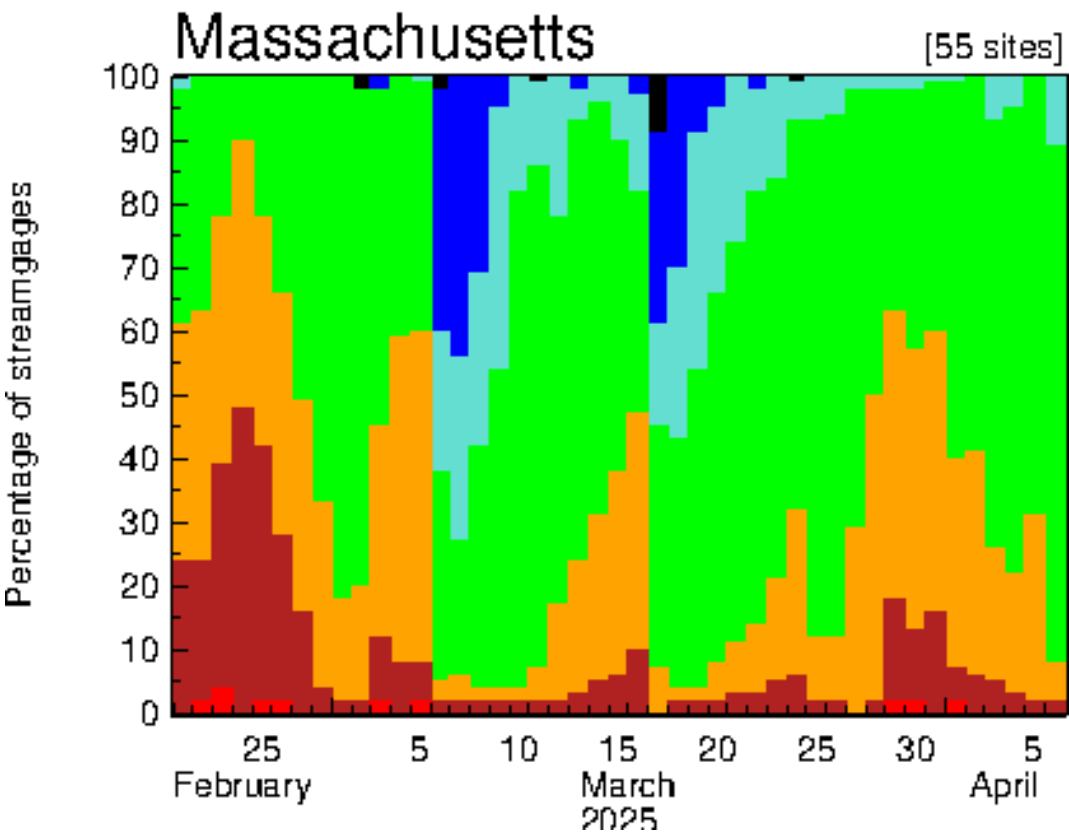
REGION	NUMBER OF GAGES REPORTING	NUMBER OF GAGES BELOW NORMAL ≥ 0 TO ≤ 30 PERCENTILE	NUMBER OF GAGES NORMAL > 30 TO ≤ 70 PERCENTILE	NUMBER OF GAGES ABOVE NORMAL > 70 TO ≤ 100 PERCENTILE	MEDIAN OF INDIVIDUAL GAGE PERCENTILES
WESTERN	8	0	5	3	64
CTRV	15	0	8	7	68
CENTRAL	11	2	3	6	72
NORTHEAST	13	5	8	0	40
SOUTHEAST	12	1	11	0	38
CAPE COD	2	2	0	0	9

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>

During March, the Albany NWS office issued a flood warning for the Hoosic River near Williamstown on the 17th and the river reached minor flood stage on the same day. The Boston NWS office issued flood warnings on the Connecticut River at Montague (3/17 & 3/18), Northampton (3/17), and Thompsonville (3/18) and all three forecast points reached minor flood stage on 3/18. There were no other flood warnings issued during March nor were there any Local Storm Reports of flooding.

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

water.noaa.gov

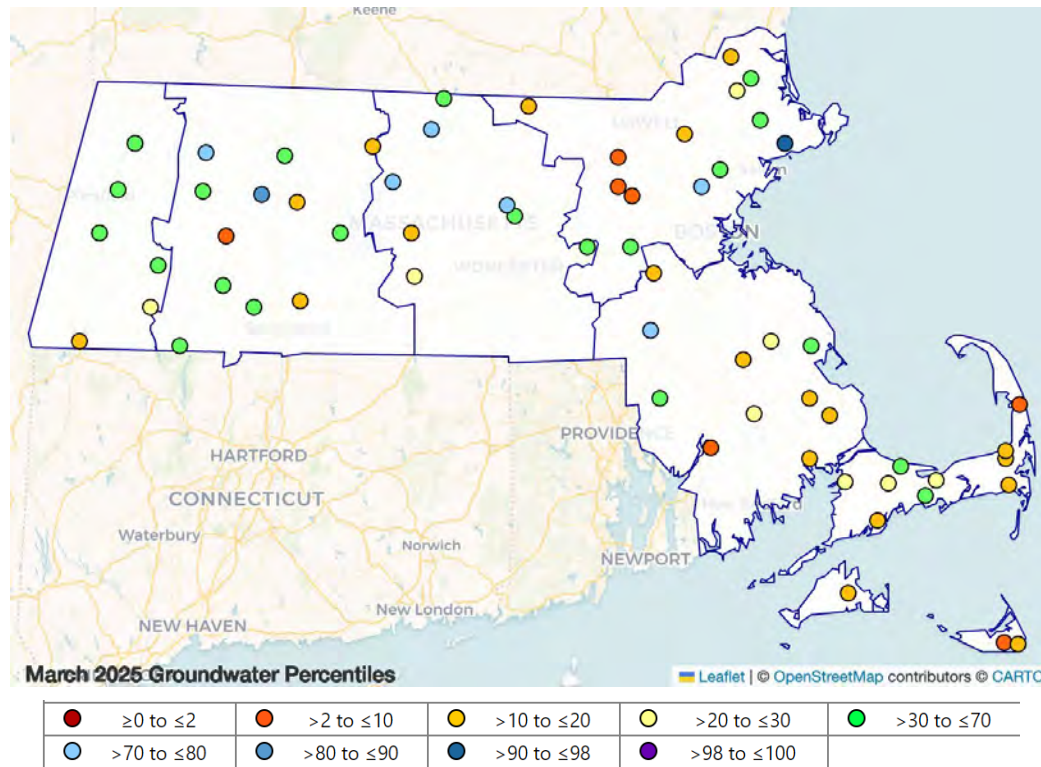


Image: Courtesy of NASA/JPL-Caltech

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

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

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



REGION	NUMBER OF WELLS REPORTING	NUMBER OF WELLS <u>BELOW</u> NORMAL ≥ 0 TO ≤ 30 PERCENTILE	NUMBER OF WELLS <u>NORMAL</u> > 30 TO ≤ 70 PERCENTILE	NUMBER OF WELLS <u>ABOVE</u> NORMAL > 70 TO ≤ 100 PERCENTILE	MEDIAN OF INDIVIDUAL WELL PERCENTILES
WESTERN	6	2	4	0	48
CTRV	12	4	6	2	41
CENTRAL	8	2	3	3	59
NORTHEAST	13	7	4	2	28
SOUTHEAST	12	8	3	1	21
CAPE COD	10	8	2	0	20
ISLANDS	3	3	0	0	12

Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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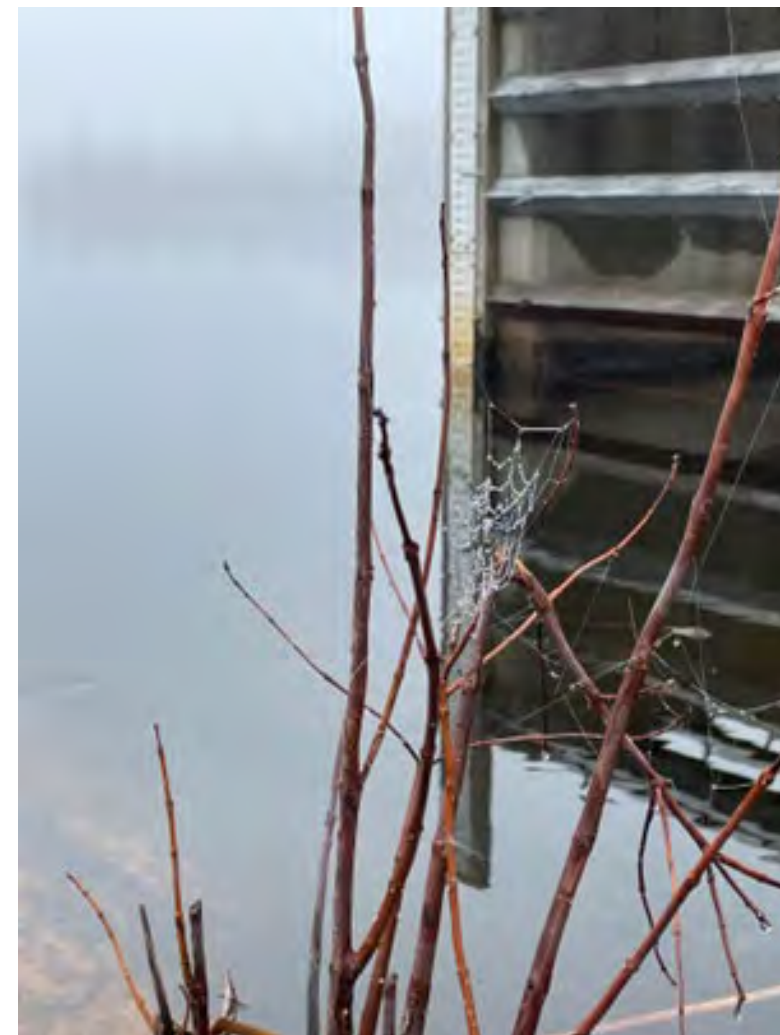
At the end of March, all but four of the 17 reporting lake and impoundment levels were below their 30th percentile. All Regions are at an elevated ISL.

REGION	NUMBER OF SITES REPORTING	MEDIAN OF INDIVIDUAL PERCENTILES OR PERCENT FULL
WESTERN	2	15th
CTRV	2	25th
CENTRAL	3	20th
NORTHEAST	5	7th
SOUTHEAST	2	27th
CAPE COD	1	25th

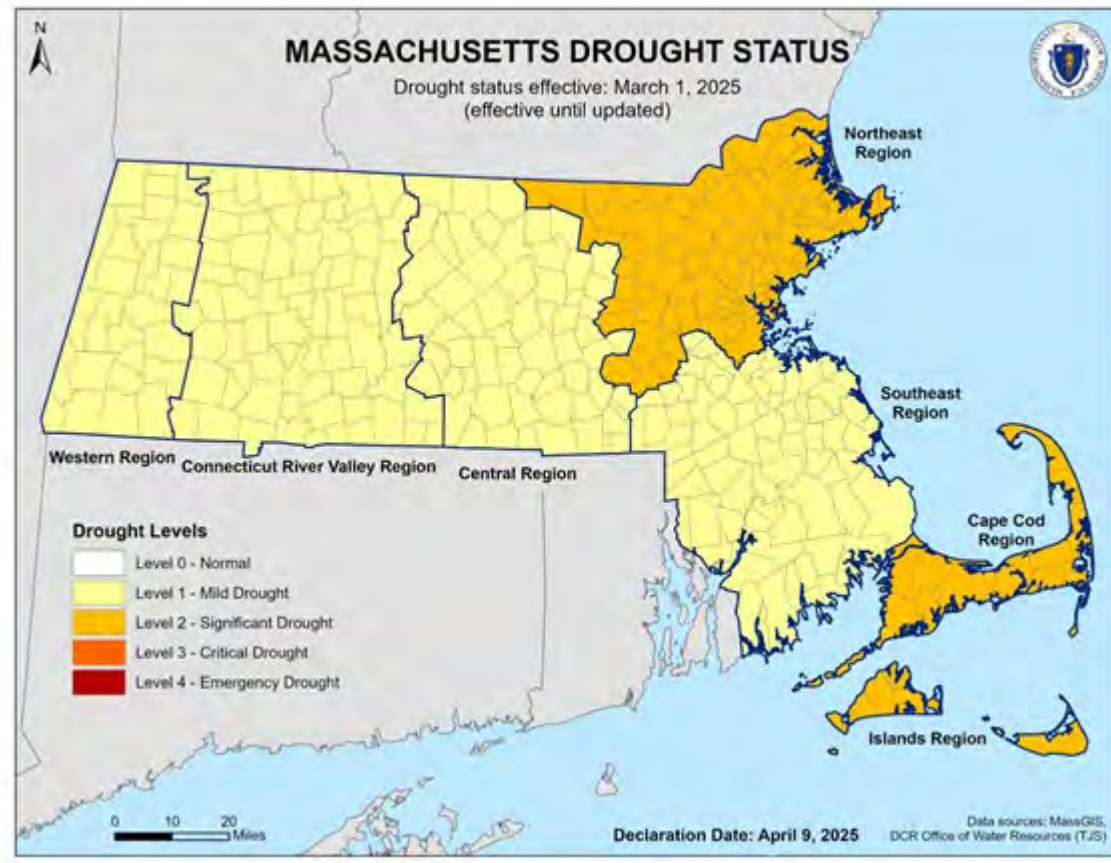
DMP Index Severity Levels do not necessarily reflect water supply status.

Index Severity Levels

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



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

Drought Indices by Region March 2025

Drought Index	Western	CT River Valley	Central	Northeast	Southeast	Cape	Islands
Precipitation (6-mos)	20	10	12	14	16	9	26
Streamflow	64	68	72	40	38	9	N/A
Groundwater	48	41	59	28	21	20	12
Lakes/Impoundments	15	25	9	7	27	25	N/A
ET*	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

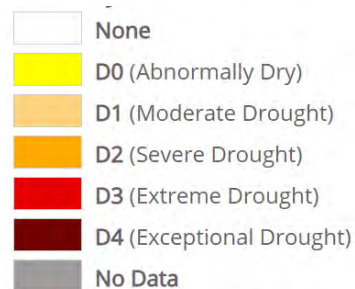
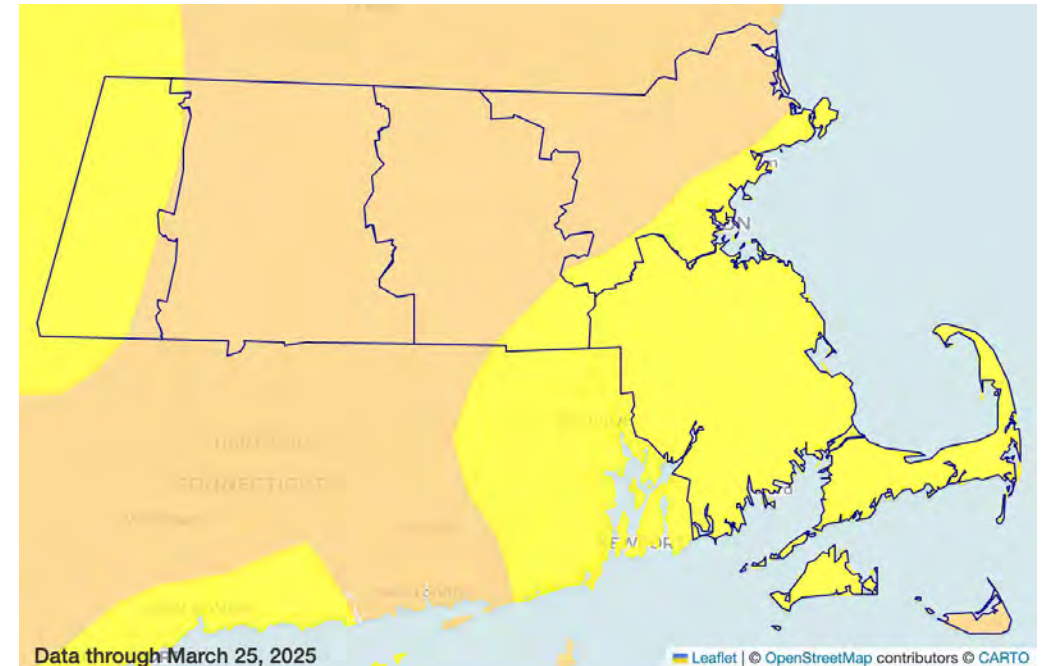
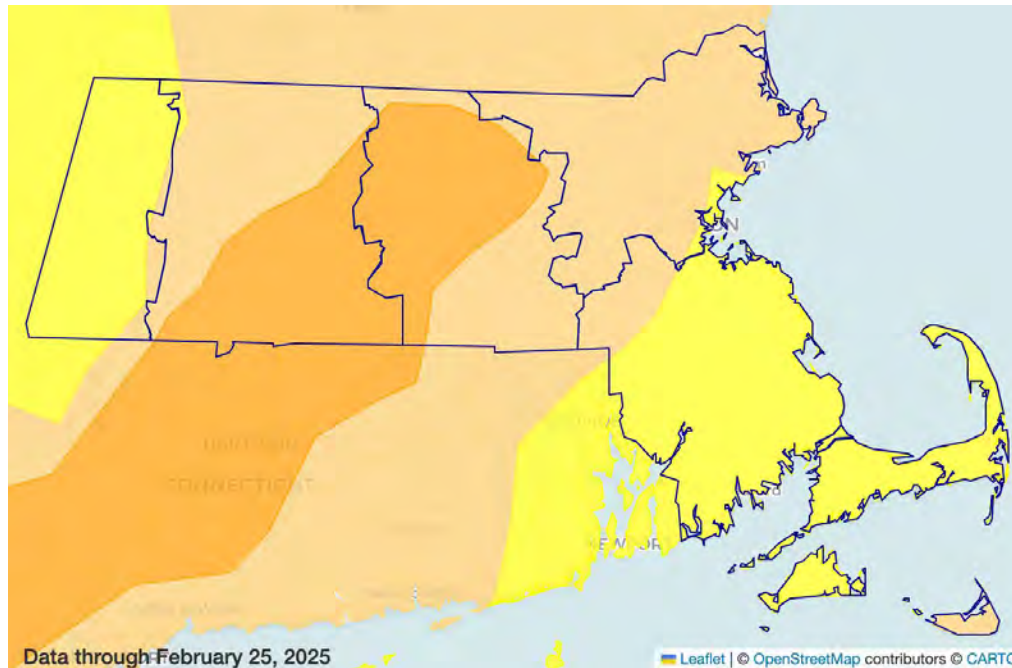
Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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U.S. DROUGHT MONITOR (USDM)

At the end of March, the USDM showed areas of D1 (Moderate Drought) and D0 (Abnormally Dry).

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



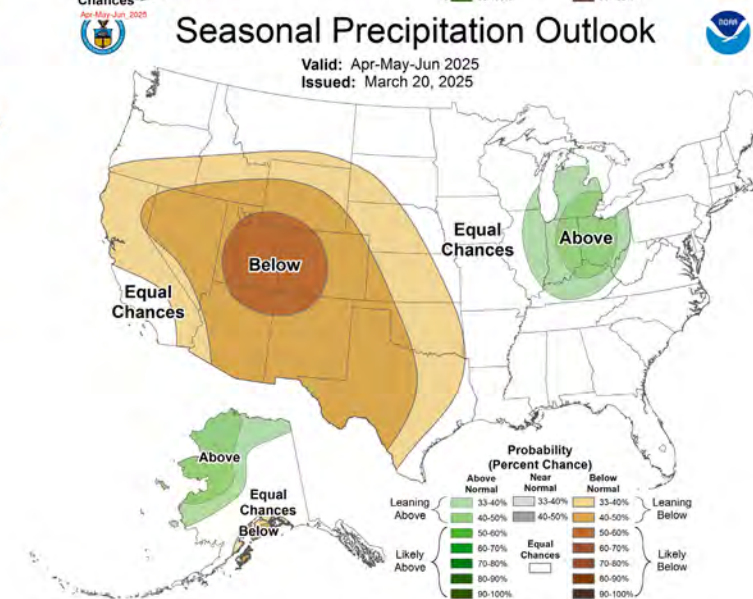
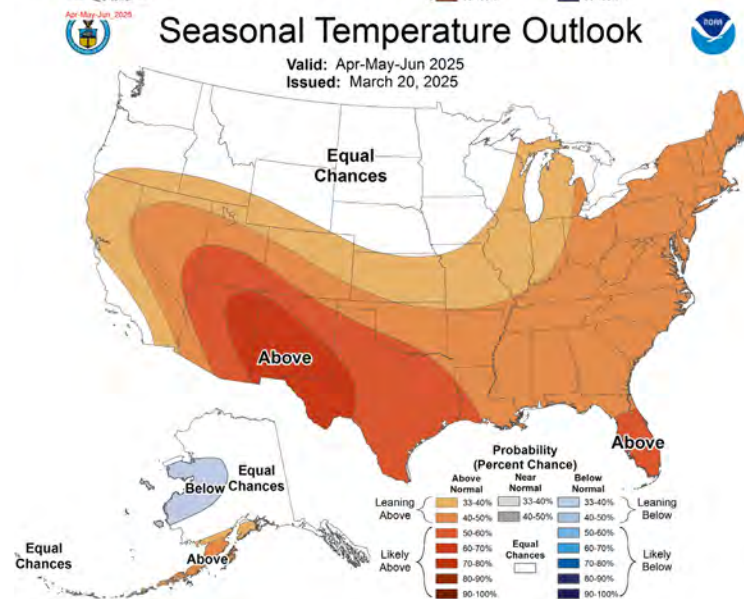
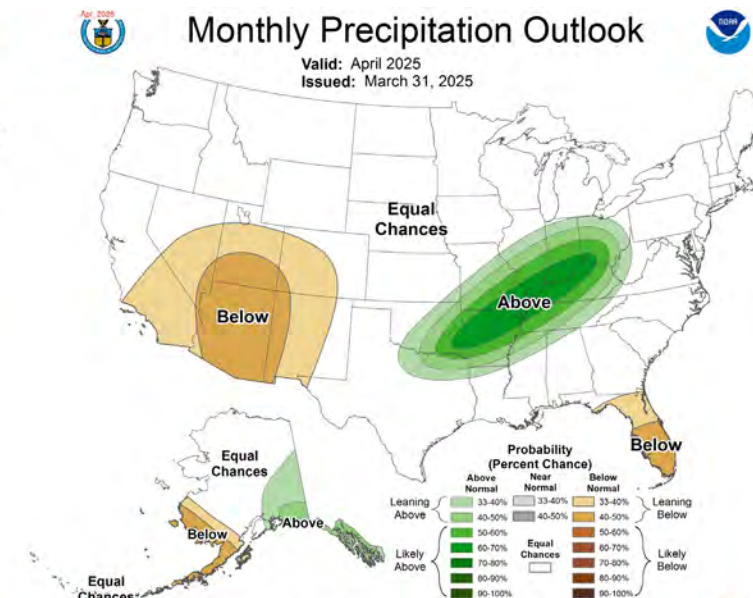
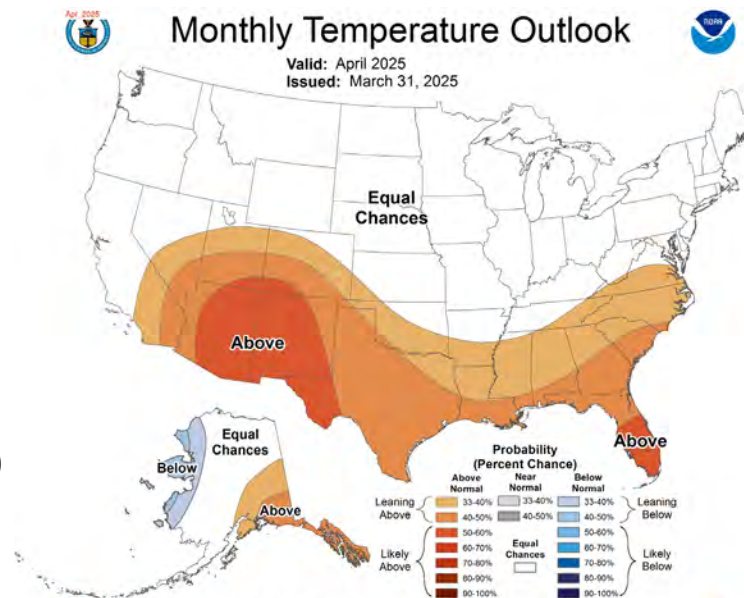
USDM	MA DMP
D0	= L1
D1	= L2
D2,D3	= L3
D4	= L4

TEMPERATURE AND PRECIPITATION OUTLOOK

April: The monthly outlook issued 3/31 shows equal chances for above-normal, normal, or below-normal temperatures and precipitation.

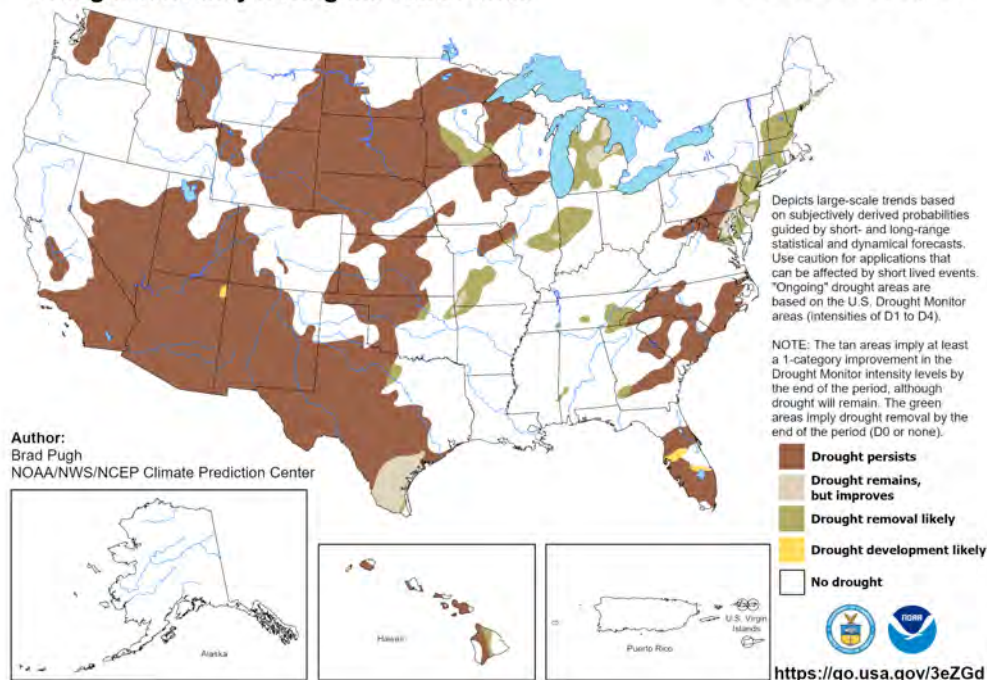
April through June: The seasonal outlook issued 3/20 shows chances leaning for above-normal temperatures and equal chances for above-normal, normal, or below-normal precipitation.

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



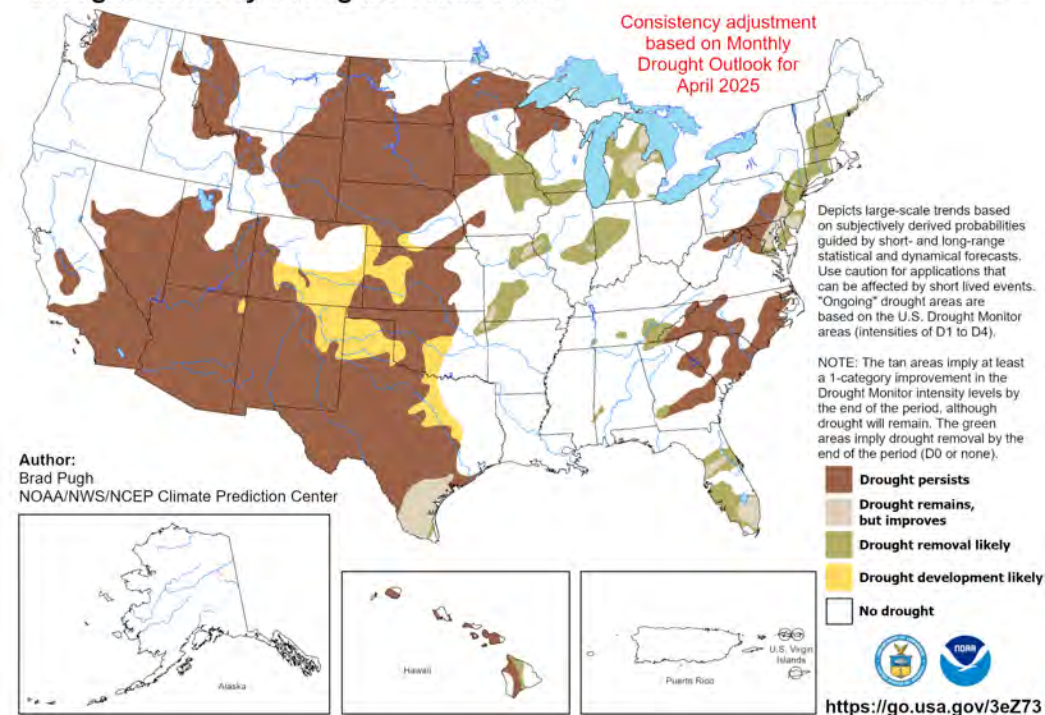
U.S. Monthly Drought Outlook Drought Tendency During the Valid Period

Valid for April 2025
Released March 31, 2025



U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

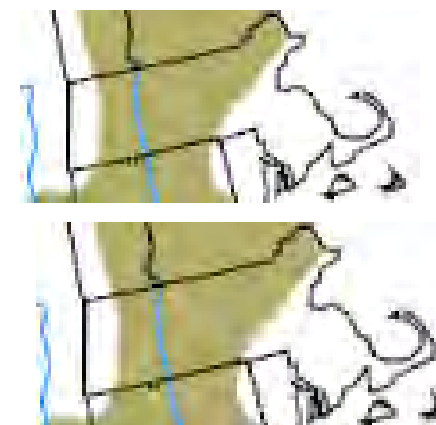
Valid for April 1 - June 30, 2025
Released March 31, 2025



MONTHLY AND SEASONAL DROUGHT OUTLOOK

Both the monthly and seasonal drought outlooks released 3/31 shows drought removal in central and northeastern parts of the state and on Nantucket.

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



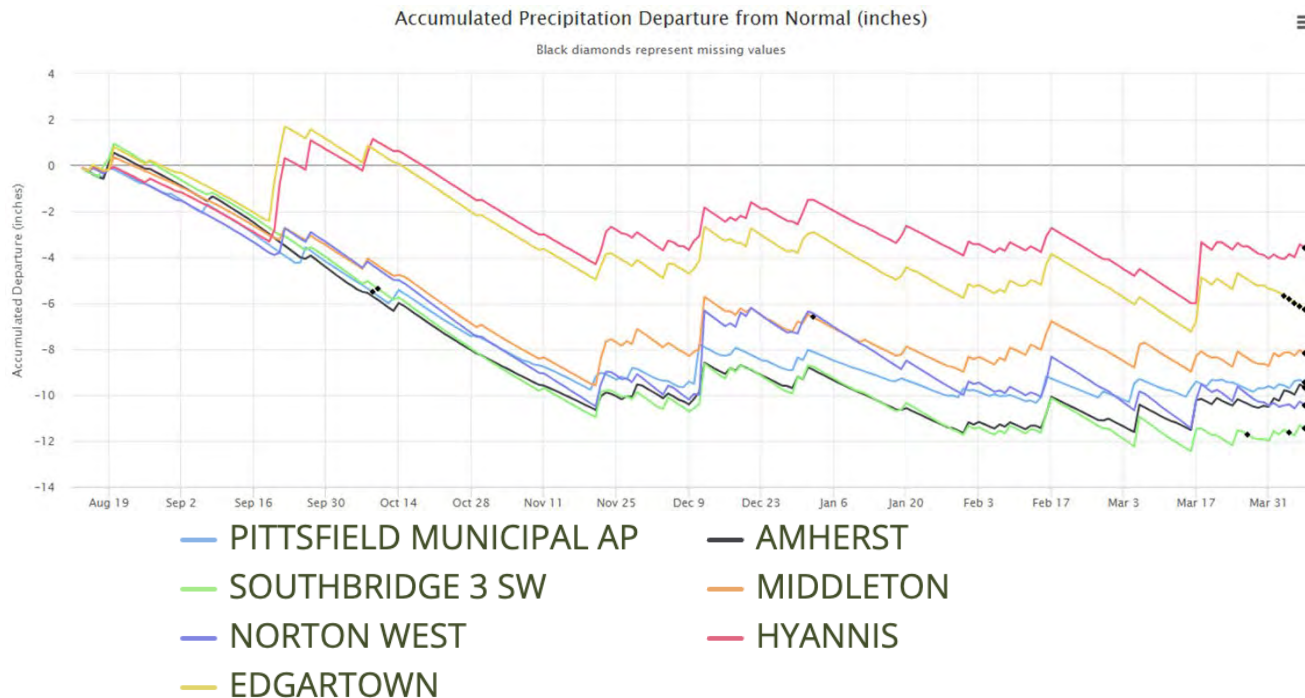
ADDITIONAL PRECIPITATION DATA

Standardized Precipitation Index— March 2025 as percentiles

Index Severity Levels

Level 0	Level 1	Level 2	Level 3	Level 4
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REGION	NUMBER OF SITES	1-mo	2-mo	3-mo	6-mo	9-mo	12-mo	24-mo	36-mo
WESTERN	4	50	57	29	20	23	28	78	73
CTRV	10	67	63	28	10	11	17	87	79
CENTRAL	16	63	60	32	12	8	15	85	79
NORTHEAST	19	50	54	33	14	12	14	78	56
SOUTHEAST	23	53	50	26	16	11	24	79	65
CAPE COD	5	55	42	17	9	10	11	29	39
ISLANDS	3	64	65	30	26	40	34	55	40



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—March 2025

REGION	NUMBER OF SITES REPORTING	HISTORICAL AVERAGE	MARCH AVERAGE (IN)	DEPARTURE FROM HISTORICAL AVERAGE (IN)	PERCENT OF NORMAL
WESTERN	4	3.34	3.13	-0.21	94%
CTRV	10	3.65	4.06	0.41	111%
CENTRAL	16	3.95	4.21	0.26	107%
NORTHEAST	19	3.96	3.74	-0.22	94%
SOUTHEAST	23	4.50	4.38	-0.12	97%
CAPE COD	5	4.33	4.23	-0.10	98%
ISLANDS	3	4.16	4.72	0.56	113%

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



Massachusetts Water Resources Commission

Executive Office of Energy and Environmental Affairs

www.mass.gov/conservemawater

www.mass.gov/drought-management