MASSACHUSETTS WATER RESOURCES COMMISSION

HYDROLOGIC CONDITIONS IN MASSACHUSETTS

JANUARY
2025

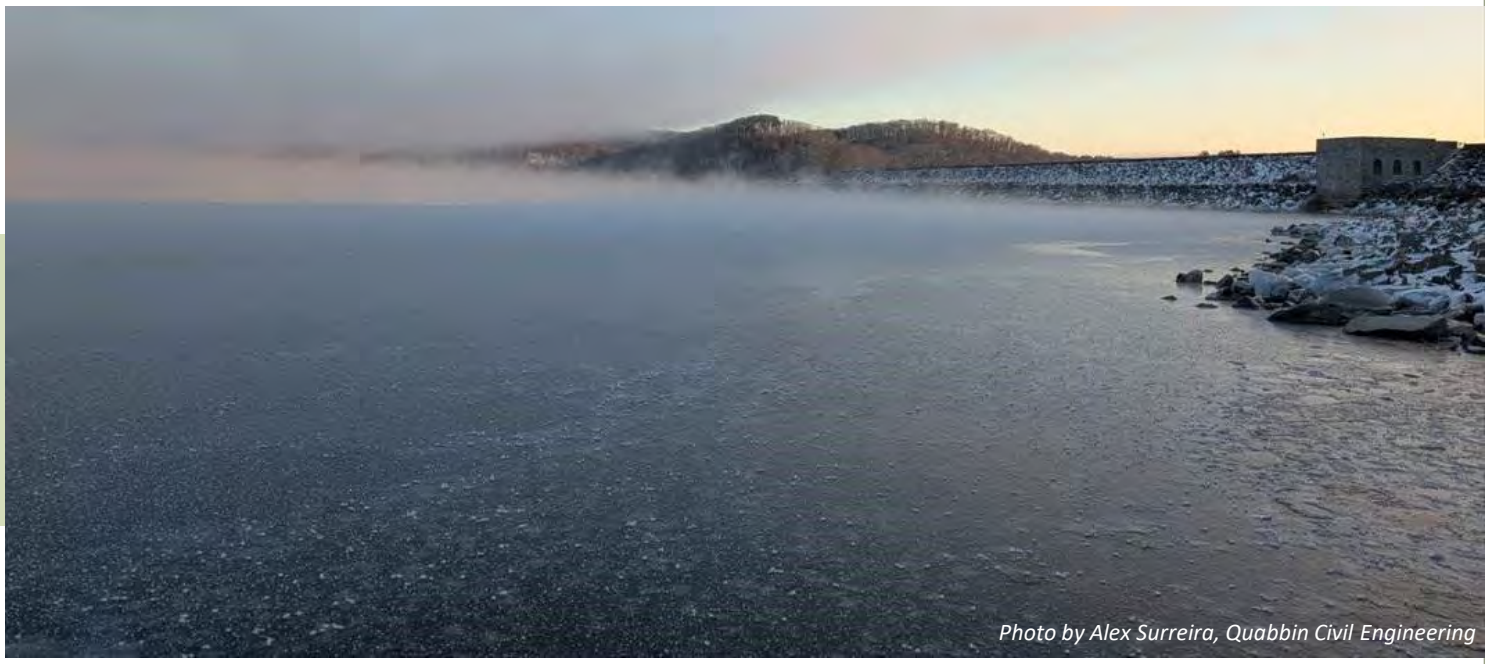


Photo by Alex Surreira, Quabbin Civil Engineering

The Commonwealth of Massachusetts

Maura T. Healey, Governor

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

JANUARY 2025 HYDROLOGIC CONDITIONS

SUMMARY OF CONDITIONS

- Monthly average temperatures were near normal.
- Precipitation was below normal.

- There was minimal snow cover at the end of January.
- The Evaporative Demand Drought Index and Keetch-Byram Drought Index are not reported in January.

- Streamflow was mostly below normal. All Regions are at elevated Index Severity Levels (ISLs). There were no reports of flooding or flood warnings in January.

- Groundwater Regional medians were all below normal. All Regions are at elevated ISLs.

- Lake and impoundment levels were below normal except for two sites. All Regions are at an elevated ISL except for Western.

- NOAA's February outlook shows chances leaning for above-normal temperatures and chances leaning for above-normal precipitation in the western part of the state and equal chances for above-normal, normal, or below-normal precipitation in the eastern part of the state.

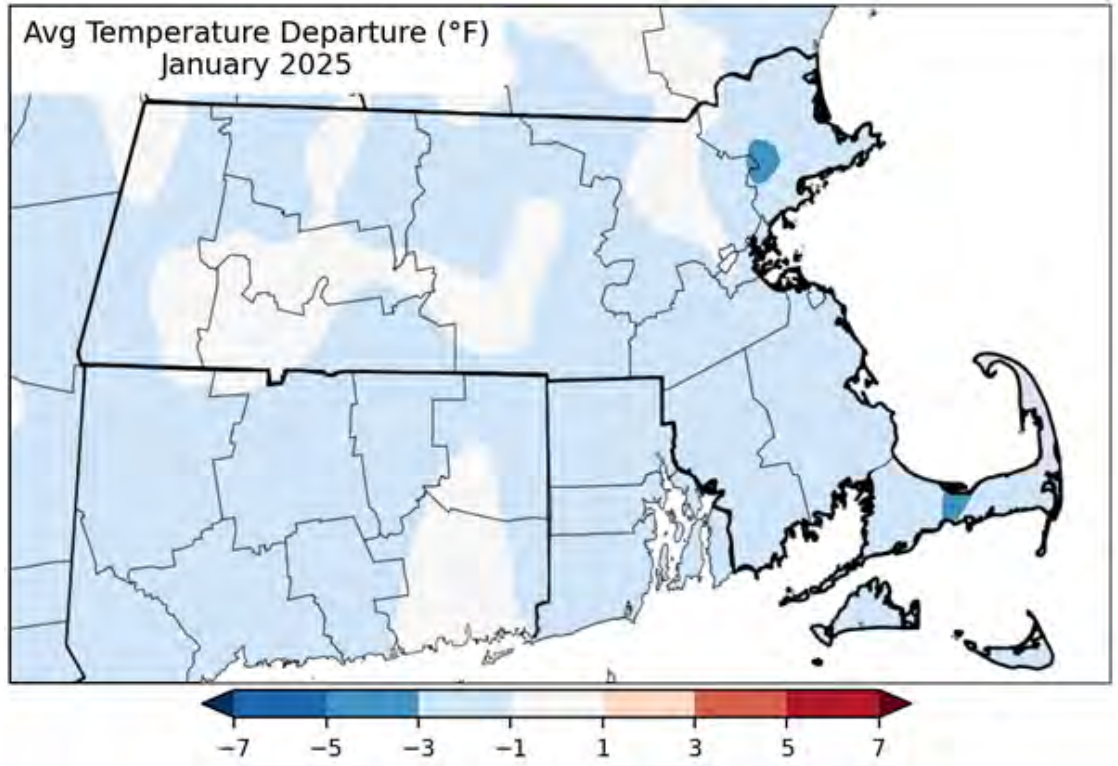
- NOAA's 3-month outlook shows chances leaning for above-normal temperatures and chances leaning for above-normal precipitation in the western part of the state and equal chances for above-normal, normal, or below-normal precipitation in the eastern part of the state

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

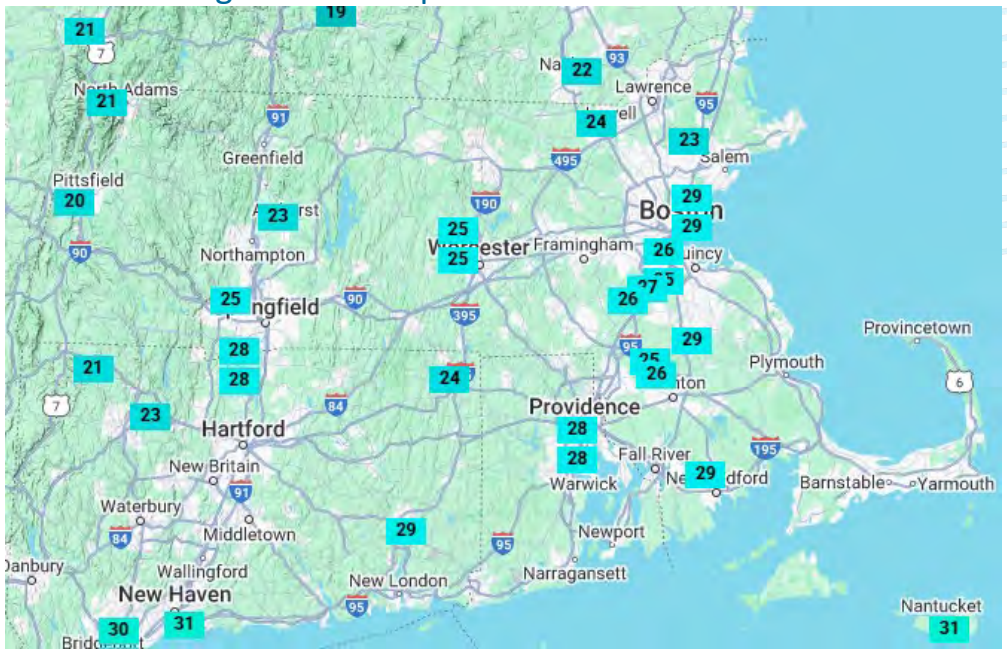
This report was prepared by the Massachusetts Department of Conservation and Recreation. Data may be preliminary. Analysis reflects automated calculations done 02/10/2025. Additional information, previous reports, and the Massachusetts Drought Dashboard with weekly updates to the drought indices can be found at: https://www.mass.gov/drought-monitoring

Monthly average temperatures were near normal.

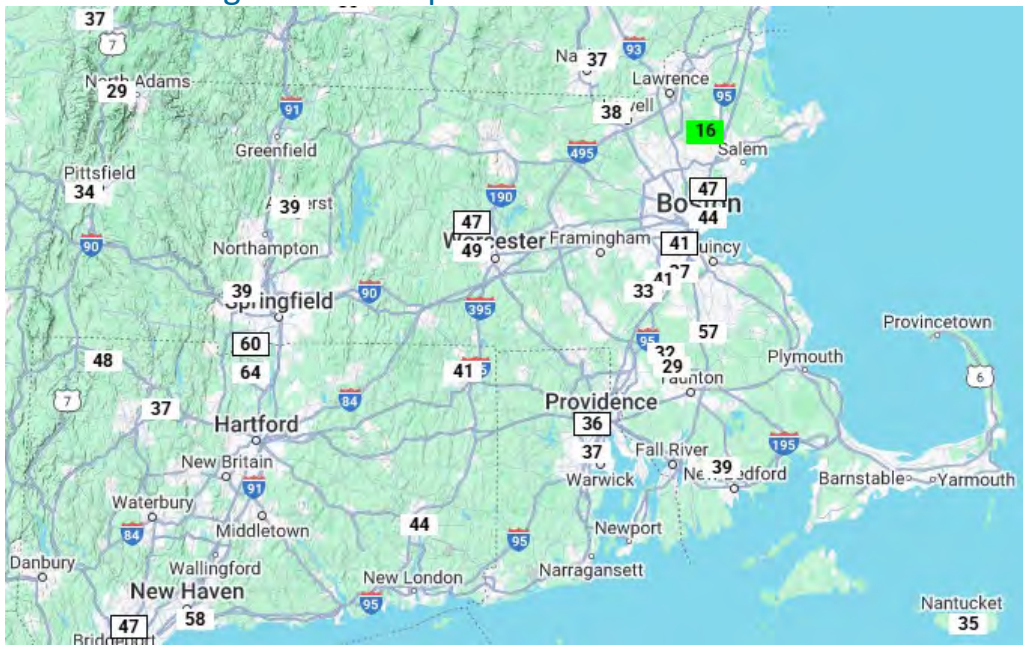
http://www.nrcc.cornell.edu/regional/monthly/monthly.html



Observed Average Mean Temperatures for Jan. 1st- 31st



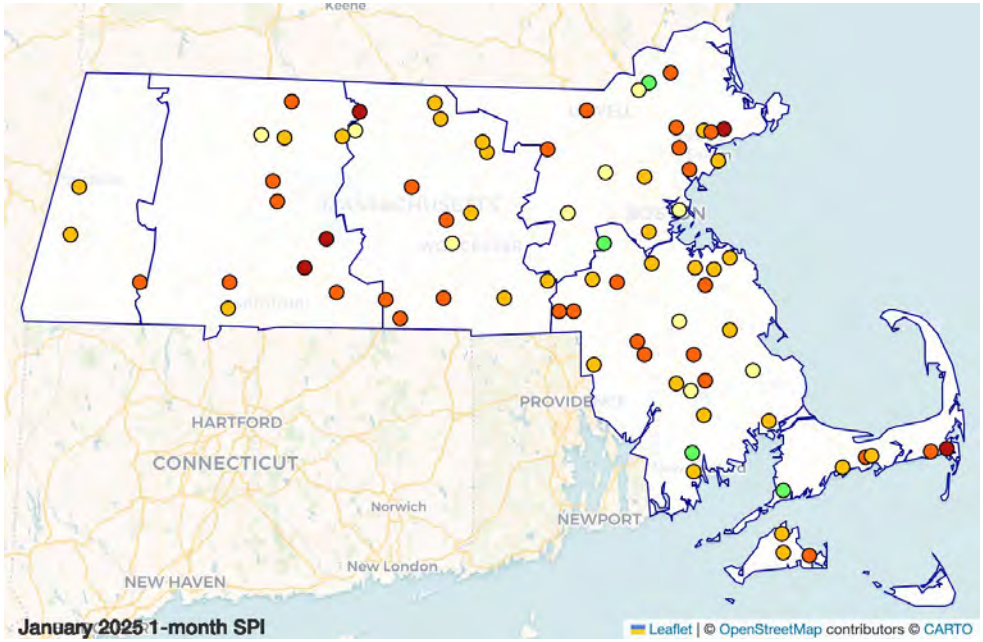
Observed Average Mean Temperature as Percentiles for Jan. 1st to 31st



https://sercc.oasis.unc.edu/Map.php?region=nrcc&

STANDARDIZED PRECIPITATION INDEX (SPI) AS A PERCENTILE

January precipitation was below normal. The 6-month look-backs for all Regions show deficits. According to the Northeast Regional Climate Center, Massachusetts had its 8th driest January on record (since 1895). 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	

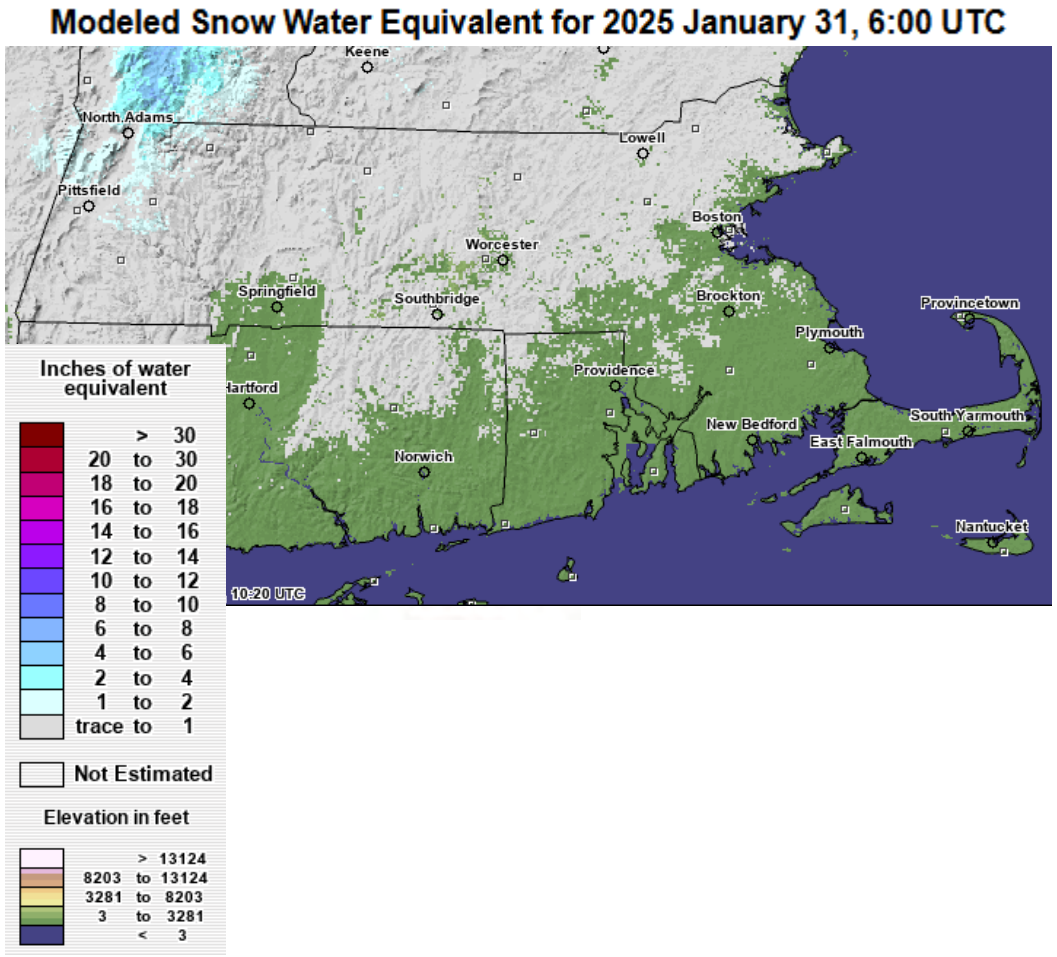
REGION	NUMBER OF SITES REPORTING	JANUARY MONTHLY AVERAGE (IN)	DEPARTURE FROM HISTORICAL (IN)	SPI PERCENTILE 1-MONTH	SPI PERCENTILE 3-MONTH	SPI PERCENTILE 6-MONTH
WESTERN	3	1.37	-1.64	11	39	16
CTRV	11	1.21	-2.07	8	17	6
CENTRAL	15	1.54	-2.08	12	25	6
NORTHEAST	17	1.70	-1.84	11	37	10
SOUTHEAST	24	2.00	-2.06	14	41	14
CAPE COD	6	1.83	-2.13	10	13	12
ISLANDS	3	1.60	-2.17	11	17	10

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.

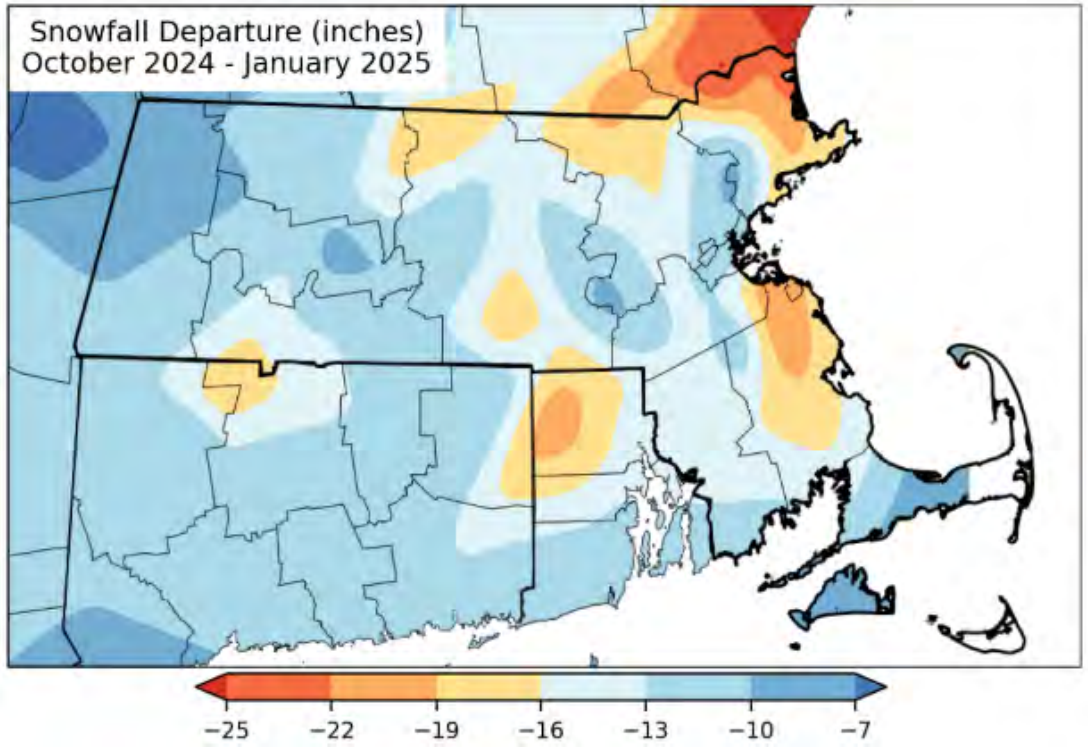
DMP Index Severity Levels			
1	2	3	4

SNOW COVER

At the end of January there was minimal snow cover across the western to northeastern parts of the state. https://www.nohrsc.noaa.gov/nsa/



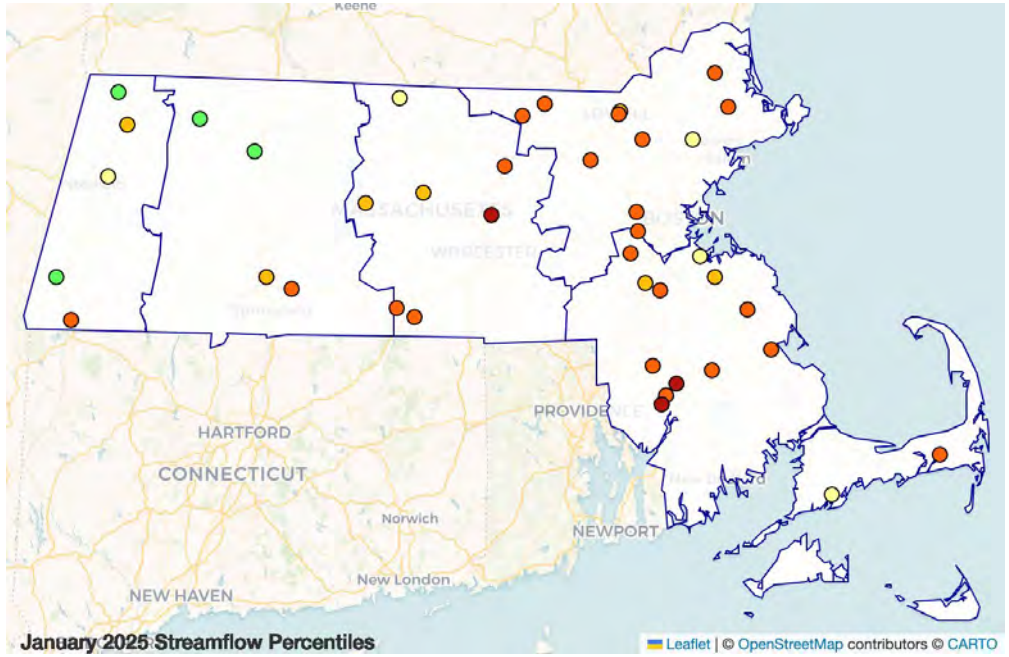
SEASON-TO-DATE SNOWFALL DEPARTURE



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

January streamflow ranged from much below normal to normal with only four gages in the normal range. All Regions are at an elevated ISLs. Approximately 22 gages did not report for January due to ice with about half of the affected gages from the CTRV Region.

MEDIAN MONTHLY STREAMFLOW PERCENTILES COMPARED TO HISTORICAL VALUES



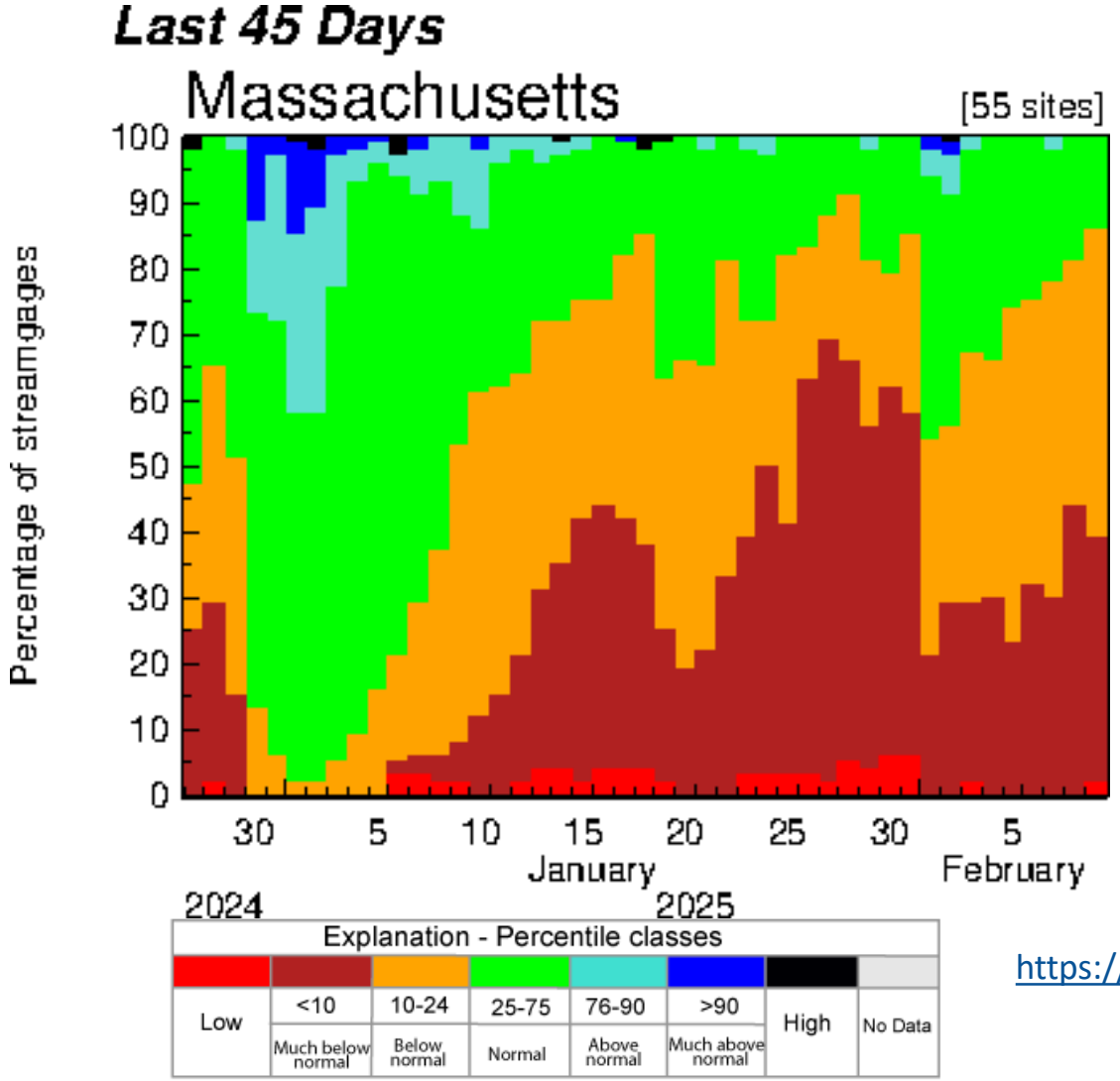
≥0 to ≤2	>2 to ≤10	>10 to ≤20	>20 to ≤30	>30 to ≤70
>70 to ≤80	>80 to ≤90	>90 to ≤98	>98 to ≤100	

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	5	3	2	0	24
CTRV	4	2	2	0	30
CENTRAL	7	7	0	0	10
NORTHEAST	11	11	0	0	8
SOUTHEAST	12	12	0	0	7
CAPE COD	2	2	0	0	16

DMP Index Severity Levels			
1	2	3	4

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

USGS TIME SERIES OF THE PERCENT OF GAGES AT THEIR RESPECTIVE PERCENTILE FLOWS FOR AVERAGE DAILY STREAMFLOWS COMPARED TO HISTORICAL VALUES



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

FLOODING

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

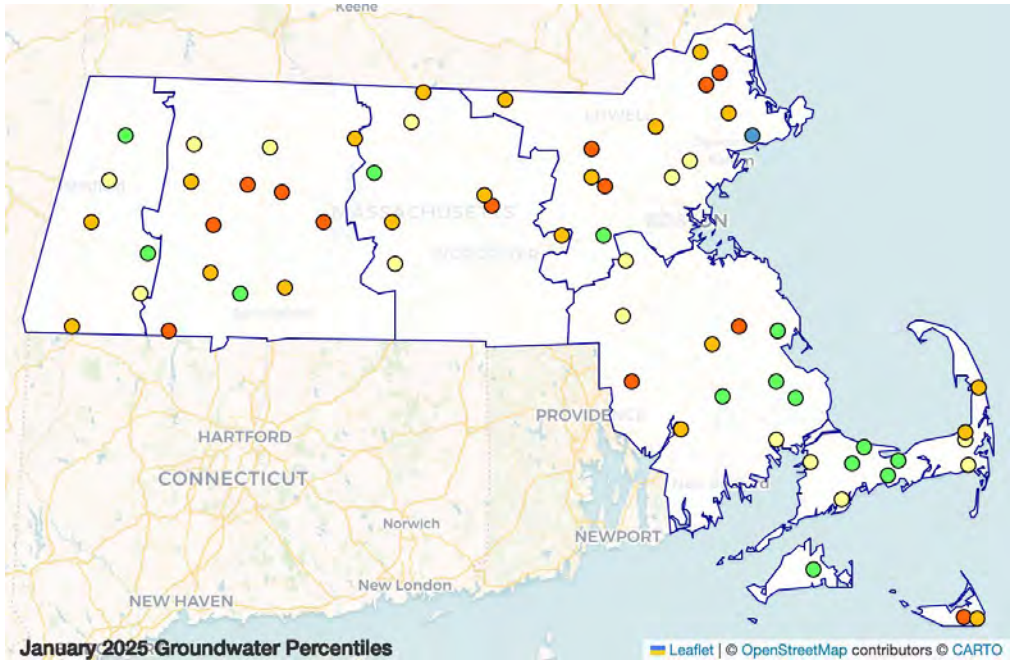
A search of the Iowa Mesonet database did not find any NWS flood warnings or local storm flooding reports. https://mesonet.agron.iastate.edu/vtec/search.php#eventsbypoint/-93.6530/41.5300

Image: Courtesy of NASA/JPL-Caltech

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

January groundwater levels ranged from below normal to normal. All Regions are at elevated ISLs.

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



REGION	NUMBER OF WELLS REPORTING	NUMBER OF WELLS BELOW NORMAL ≥0 TO ≤30 PERCENTILE	NUMBER OF WELLS NORMAL >30 TO ≤70 PERCENTILE	NUMBER OF WELLS ABOVE NORMAL >70 TO ≤100 PERCENTILE	MEDIAN OF INDIVIDUAL WELL PERCENTILES
WESTERN	6	4	2	0	25
CTRV	12	11	1	0	11
CENTRAL	8	7	1	0	15
NORTHEAST	13	11	2	0	15
SOUTHEAST	12	8	4	0	22
CAPE COD	10	6	4	0	27
ISLANDS	3	2	1	0	16

DMP Index Severity Levels

1 | 2 | 3 | 4

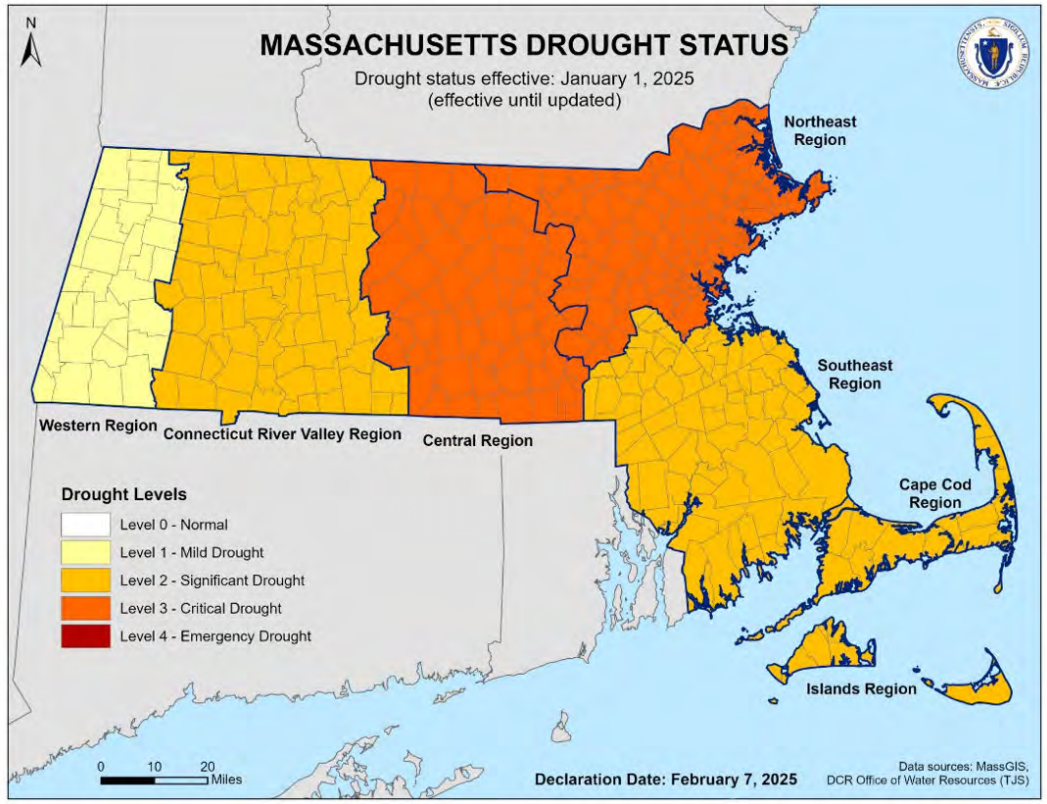
At the end of January, all but two of the reported lake and impoundment levels were below their 30th percentile. All Regions are at an elevated ISL except for Western.

REGION	NUMBER OF SITES REPORTING	MEDIAN OF INDIVIDUAL PERCENTILES OR PERCENT FULL
WESTERN	1	100%
CTRV	2	22nd
CENTRAL	4	1st
NORTHEAST	4	5th
SOUTHEAST	2	29th
CAPE COD	1	25th

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

DMP Index Severity Levels			
1	2	3	4

MASSACHUSETTS DROUGHT STATUS



On February 7, 2025, Massachusetts Energy and Environmental Affairs (EEA) Secretary Rebecca L. Tepper declared that starting from January 1, 2025, the Western Region is at Level 1 - Mild Drought, the Connecticut River Valley, Southeast, Cape Cod, and Islands Regions are at Level 2 - Significant Drought, and the Central and Northeast Regions are at Level 3 – Critical Drought. This status remains in effect until further updated.

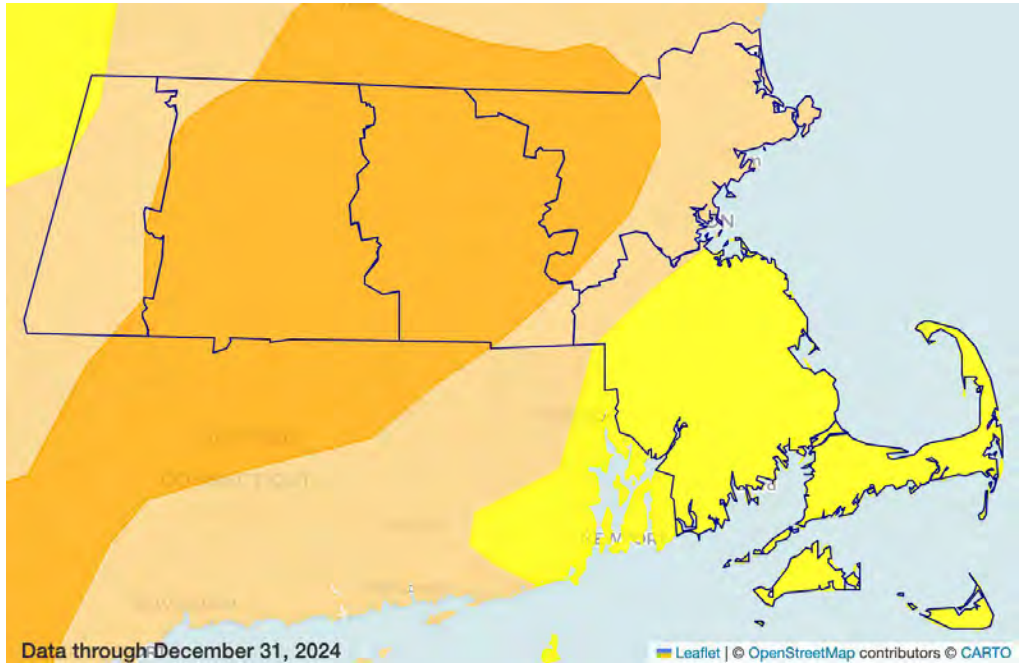
Drought Indices by Region January 2025

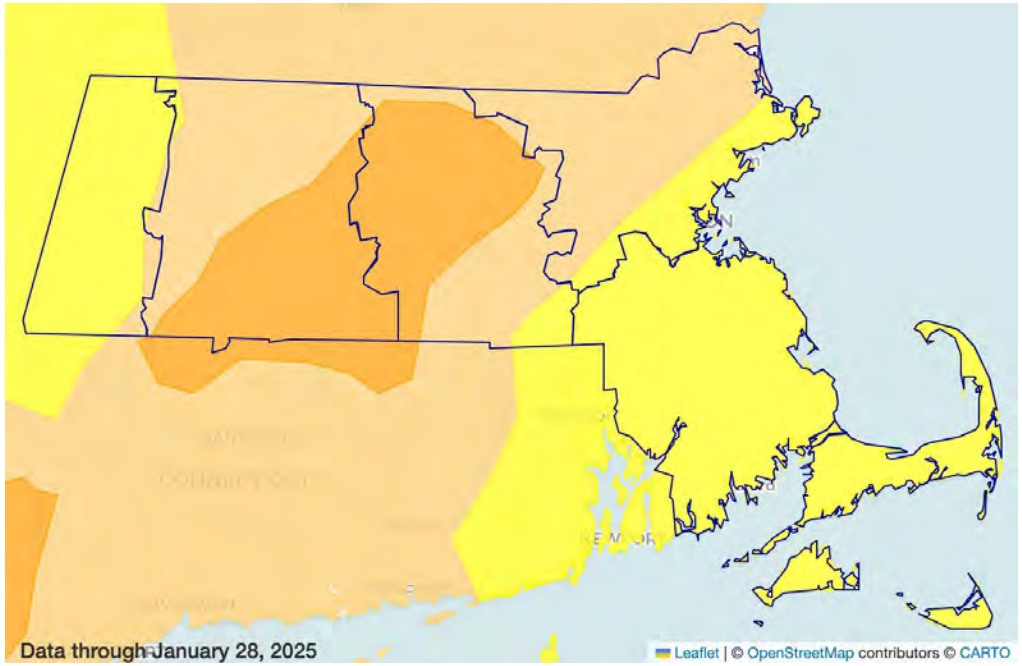
Drought Index	Western	CT River Valley	Central	Northeast	Southeast	Cape	Islands
Precipitation (6-mos)	16	6	6	10	14	12	10
Streamflow	24	30	10	8	7	16	N/A
Groundwater	25	11	15	15	22	27	16
Lakes/Impoundments	100%	22	1	4	29	25	N/A
ET	N/A	N/A	N/A	N/A	N/A	N/A	N/A
KBDI	N/A	N/A	N/A	N/A	N/A	N/A	N/A

U.S. DROUGHT MONITOR (USDM)

At the end of January, the USDM showed areas of D2 (Severe Drought), 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





None
D0 (Abnormally Dry)
D1 (Moderate Drought)
D2 (Severe Drought)
D3 (Extreme Drought)
D4 (Exceptional Drought)
No Data

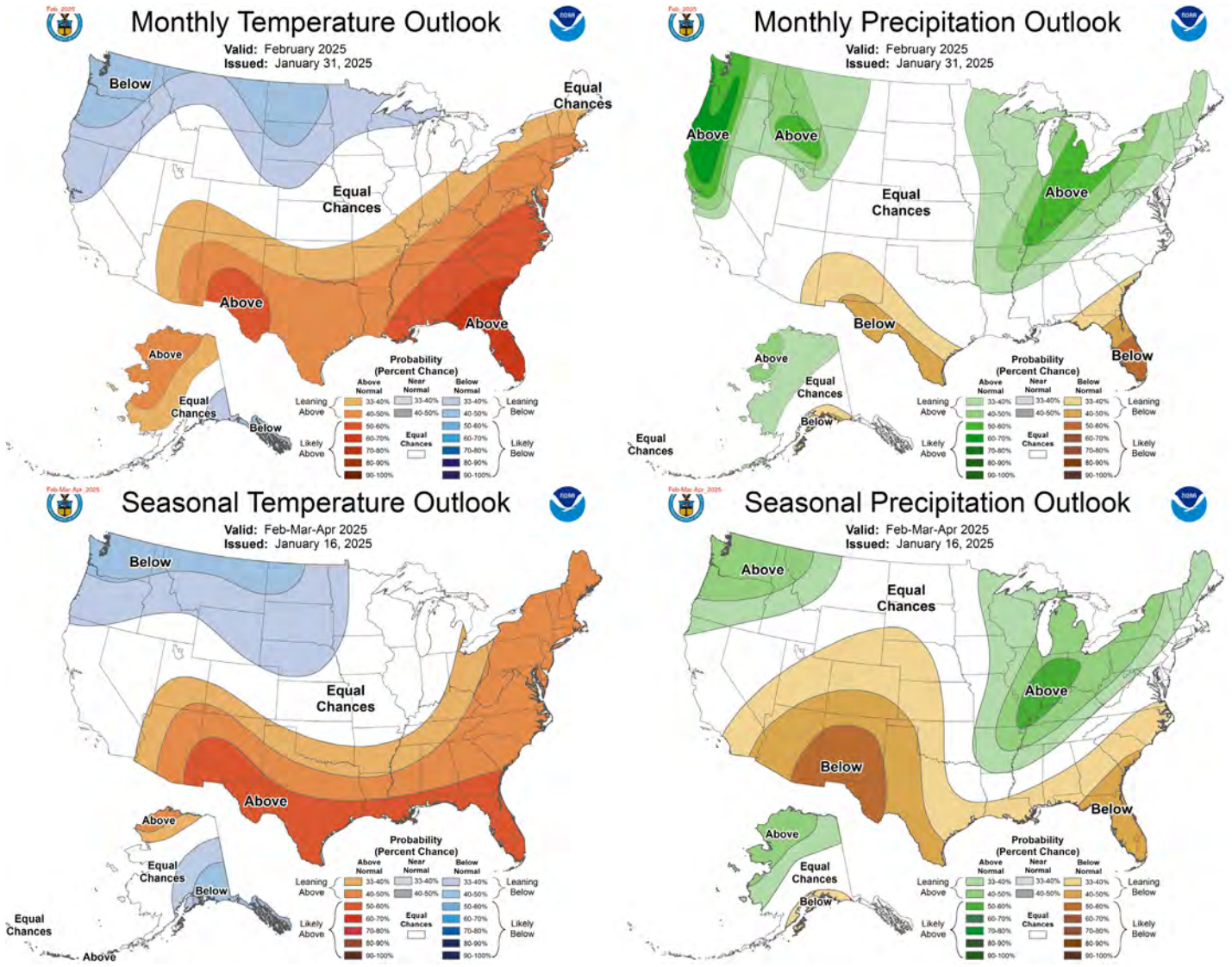
NOAA CLIMATE PREDICTION CENTER

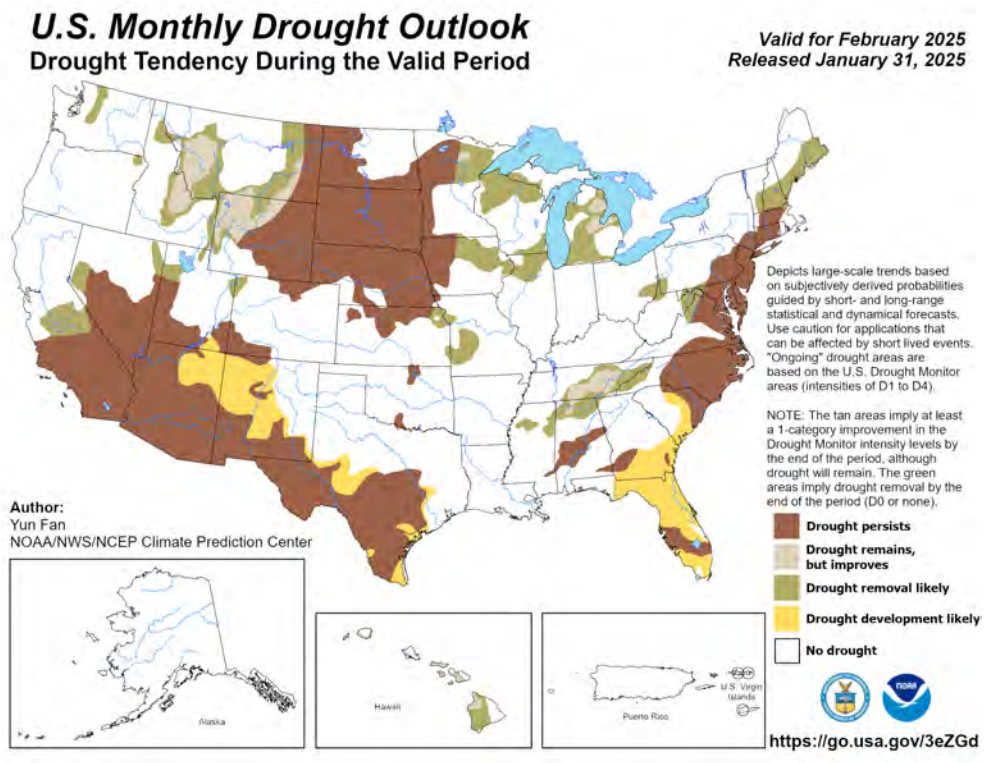
TEMPERATURE AND PRECIPITATION OUTLOOK

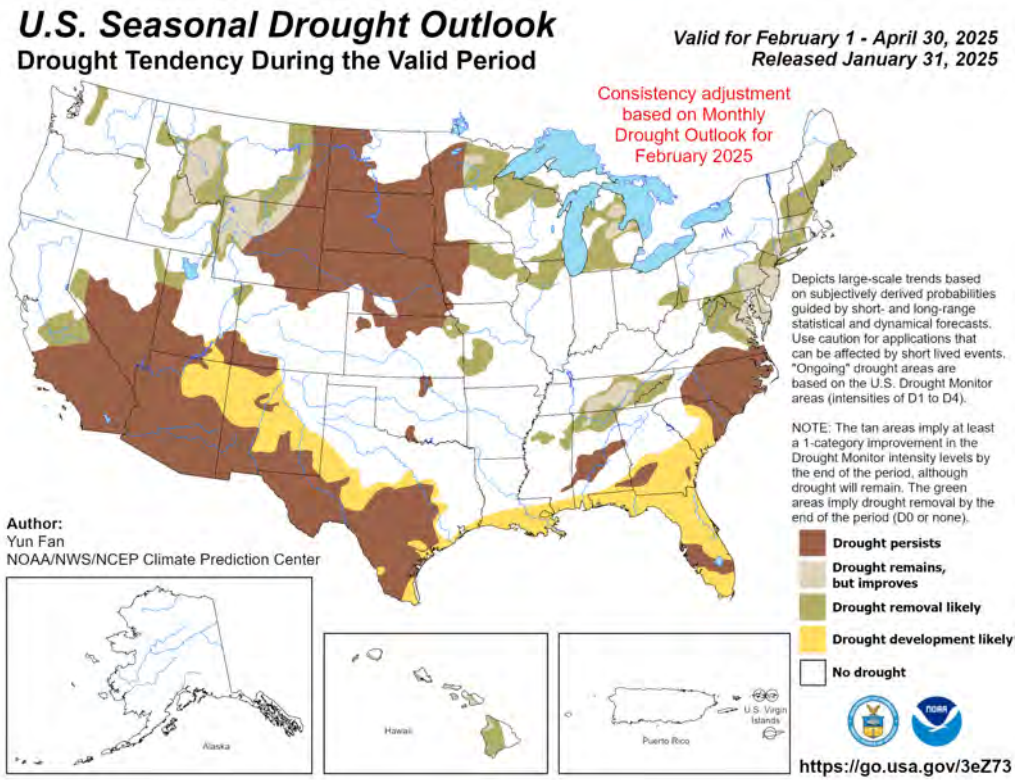
February: The monthly outlook issued 1/31 shows chances leaning for above-normal temperatures and chances leaning for above-normal precipitation in the western part of the state and equal chances for above-normal, normal, or below-normal precipitation in the eastern part of the state.

February through April: The seasonal outlook issued 1/16 shows chances leaning for above-normal temperatures and chances leaning for above-normal precipitation in the western part of the state and equal chances for above-normal, normal, or below-normal precipitation in the eastern part of the state.

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







MONTHLY AND SEASONAL DROUGHT OUTLOOK

The monthly drought outlook released 1/31 shows drought persisting in the central part of the state and removal likely in the northeast.

The seasonal outlook released 1/31 shows drought remaining but improving in the central parts of the state with some areas of likely removal.

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

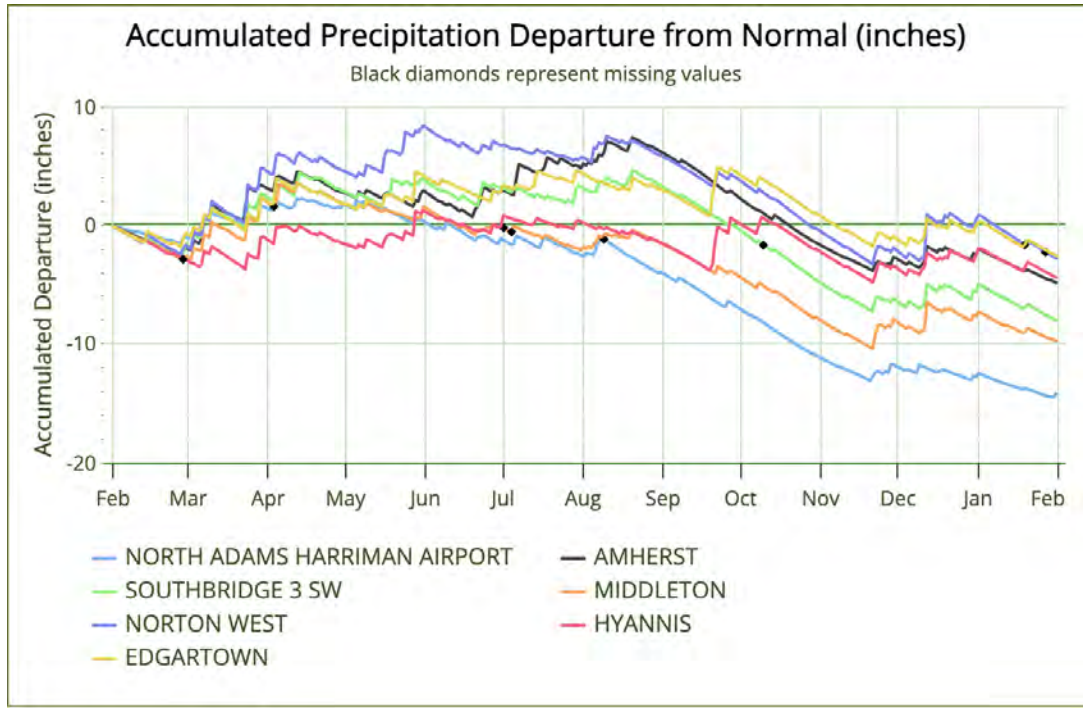
ADDITIONAL PRECIPITATION DATA

Standardized Precipitation Index—January 2025 as percentiles

REGION	NUMBER OF SITES	1-mo	2-mo	3-mo	6-mo	9-mo	12-mo	24-mo	36-mo
WESTERN	3	11	43	39	16	21	40	76	75
CTRV	11	8	24	17	6	14	31	79	75
CENTRAL	15	12	34	25	6	12	28	81	80
NORTHEAST	17	11	38	37	10	9	19	76	56
SOUTHEAST	24	14	53	41	14	20	47	75	68
CAPE COD	6	10	28	13	12	15	11	42	40
ISLANDS	3	11	38	17	10	28	26	20	35

DMP Index Severity Levels

1	2	3	4



Accumulated Precipitation Departure from 30-Year Normals in Inches

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—January 2025

REGION	NUMBER OF SITES REPORTING	HISTORICAL AVERAGE	JANUARY AVERAGE (IN)	DEPARTURE FROM HISTORICAL AVERAGE (IN)	PERCENT OF NORMAL
WESTERN	3	3.01	1.37	-1.64	46%
CTRV	11	3.28	1.21	-2.07	37%
CENTRAL	15	3.62	1.54	-2.08	43%
NORTHEAST	17	3.54	1.70	-1.84	48%
SOUTHEAST	24	4.06	2.00	-2.06	49%
CAPE COD	6	3.96	1.83	-2.13	46%
ISLANDS	3	3.77	1.60	-2.17	42%

APPENDIX II

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	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