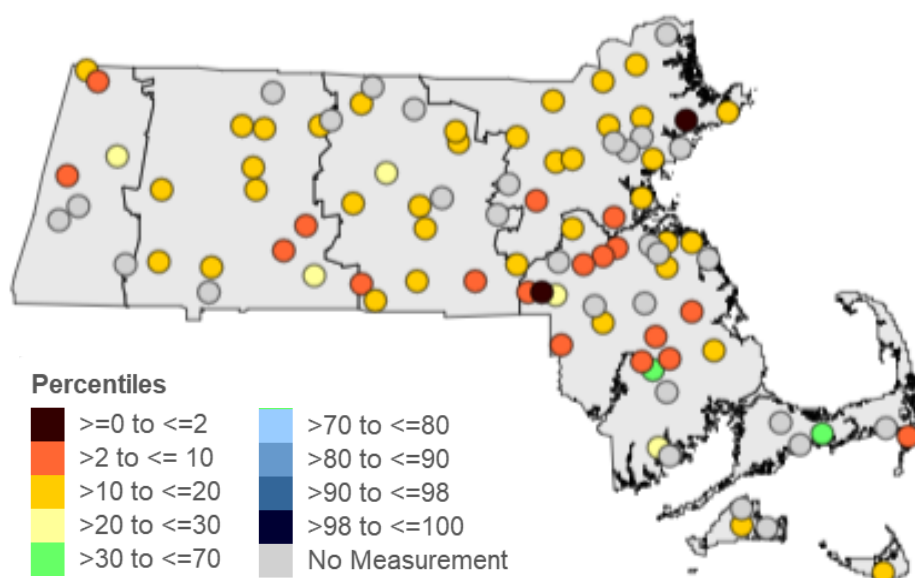


January 2020 Hydrologic Conditions in Massachusetts

SUMMARY OF CONDITIONS

- Monthly temperatures were above average for January. It was the 3rd warmest on record for Boston.
- Precipitation as snow and rain was significantly lower than median values. The Index severity levels for the 1-month SPI range from Level 1 to Level 3 for all regions.
- Streamflow and groundwater were greater than 30th percentile values. Index severity levels are 0.
- Lakes and Impoundments were greater than 30th percentile values. Index severity levels are 0.
- For February, NOAA projects a 33% chance for above normal temperatures and equal chances for below-normal, normal, or above-normal precipitation.
- Appendices I and II provide additional precipitation data and information on the Massachusetts Drought Management Plan (DMP), respectively.

PRECIPITATION



Precipitation was significantly below median values for January. For the 1-month SPI, one region is at Severity Level 1, four regions are at Severity Level 2, and two regions are at Severity Level 3. All look-back periods for the SPI beyond the 1-month are at Severity Level 0.

Region	Number of Sites	January Average (inches)	Departure from Historical (inches)	DMP SPI 1-month	DMP SPI 2-month	DMP SPI 3-month
Western	4	1.85	-1.12	-0.89	0.09	0.26
CT River Valley	11	1.90	-1.43	-0.91	0.52	0.23
Central	12	1.85	-1.60	-0.94	0.46	0.08
Northeast	14	1.58	-1.92	-1.11	0.30	0.10
Southeast	19	1.63	-2.33	-1.55	0.30	0.29
Cape Cod	2	2.63	-1.31	-0.82	1.22	0.75
Islands	2	1.71	-1.66	-1.42	0.59	0.11

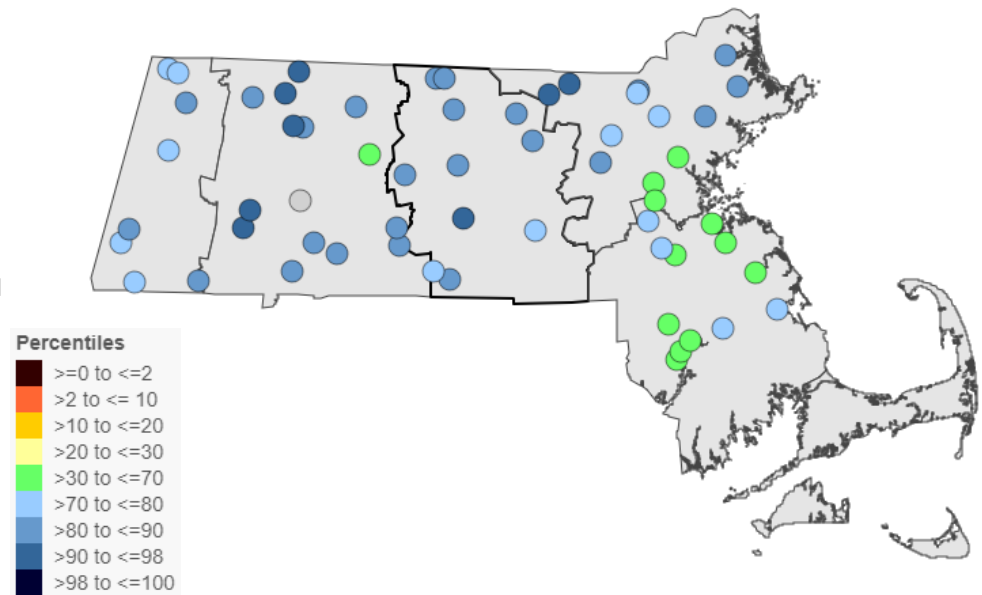
STREAMFLOW

Monthly median streamflows were all greater than their respective 30th percentile values for January, with many recording significantly higher. Eight gages recorded greater than 90th percentile median flows.

Median Monthly Streamflows Compared to Historical Values

Streamflow is monitored by the Commonwealth of Massachusetts and United States Geological Survey (USGS) cooperative stream gaging program.

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



Region	Number of Gages						Median of Individual Gage Percentiles	DMP Index Severity
	Total Reporting for January	≥0 to ≤2 Percentile	>2 to ≤10 Percentile	>10 to ≤20 Percentile	>20 to ≤30 Percentile	> 90 Percentile		
Western	8	0	0	0	0	0	80	0
CT River	14	0	0	0	0	5	89	0
Central	11	0	0	0	0	1	85	0
Northeast	13	0	0	0	0	2	83	0
Southeast	12	0	0	0	0	0	60	0

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

Time Series of Average Daily Streamflows Compared to Historical Values

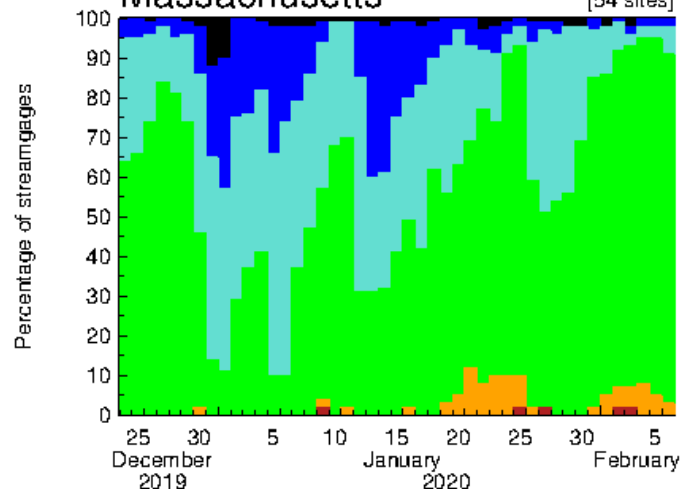
https://waterwatch.usgs.gov/index.php?id=real&sid=w_plot_sum&r=ma

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		

Last 45 Days

Massachusetts

[54 sites]

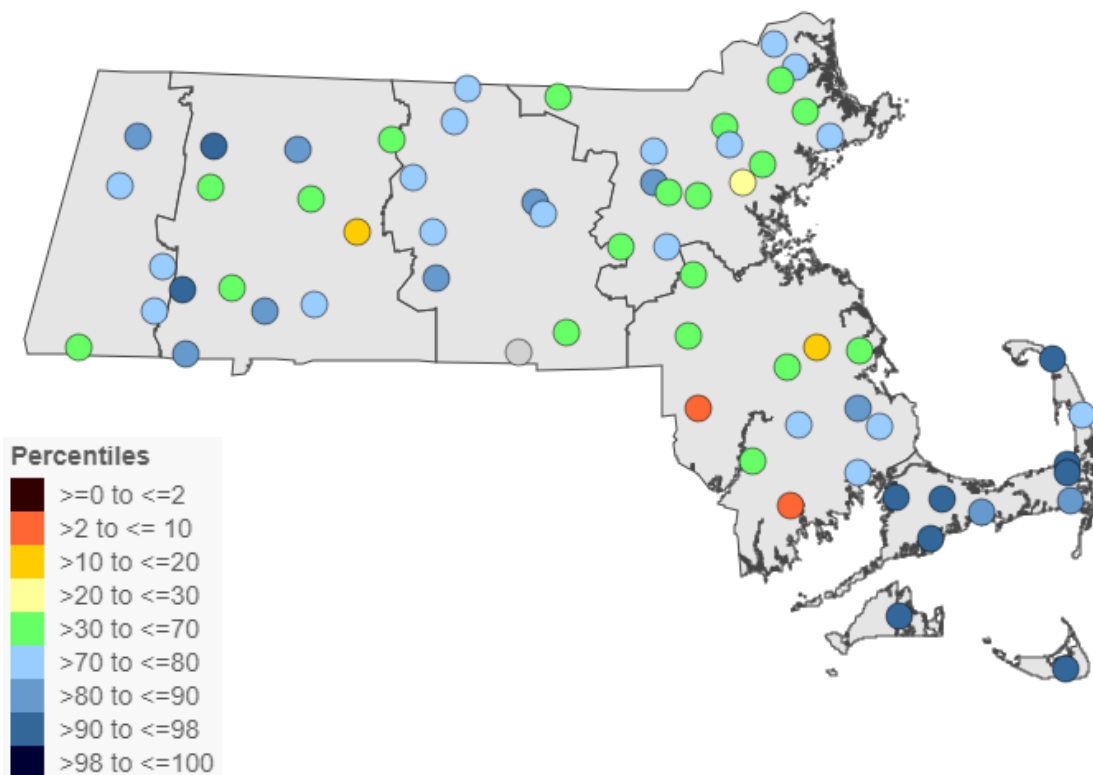


GROUNDWATER

The Pelham 23 well has been lower than its 30th percentile value since June but made slight gains from December. Three wells in the Southeast Region are below their 20th percentile values and one well in the Northeast is below its 30th percentile. All other wells are above their 30th percentile values, with 10 wells greater than their 90th percentile values. All regions are at an Index Severity of Level 0.

End of January Groundwater Compared to Historical in the Climate Response Network

<https://groundwaterwatch.usgs.gov/NetMapT1L2.asp?ncd=crn&sc=25>



Region	Number of Wells						Median of Individual Percentiles	DMP Index Severity
	Total Reporting for Jan.	≥0 to ≤2 Percentile	>2 to ≤10 Percentile	>10 to ≤20 Percentile	>20 to ≤30 Percentile	>90th Percentile		
Western	5	0	0	0	0	0	74	0
CT River Valley	11	0	0	1	0	2	71	0
Central	9	0	0	0	0	0	76	0
Northeast	15	0	0	0	1	0	68	0
Southeast	12	0	2	1	0	0	59	0
Cape Cod	9	0	0	0	0	6	95	0
Islands	2	0	0	0	0	2	95	0

LAKES and IMPOUNDMENTS

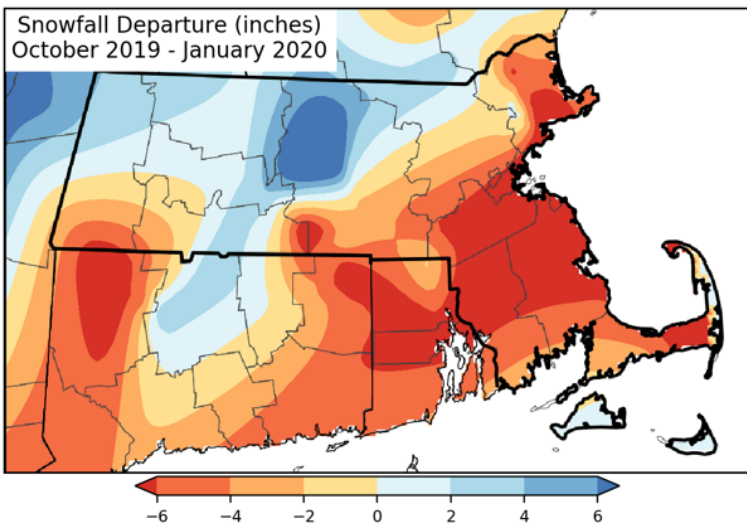
At the end of January, all drought regions were at Index Severity 0.

Region	Total Reporting for Jan.	Median of Lakes and Impoundments Percentiles	DMP Index Severity
Western	2	64	0
CT River Valley	2	78	0
Central	3	94	0
Northeast	7	58	0
Southeast	2	69	0
Cape Cod	1	100	0
Islands	N/A	N/A	N/A

KEETCH BYRAM INDEX (KBDI) and CROP MOISTURE INDEX (CMI)

KBDI and CMI are reported seasonally.

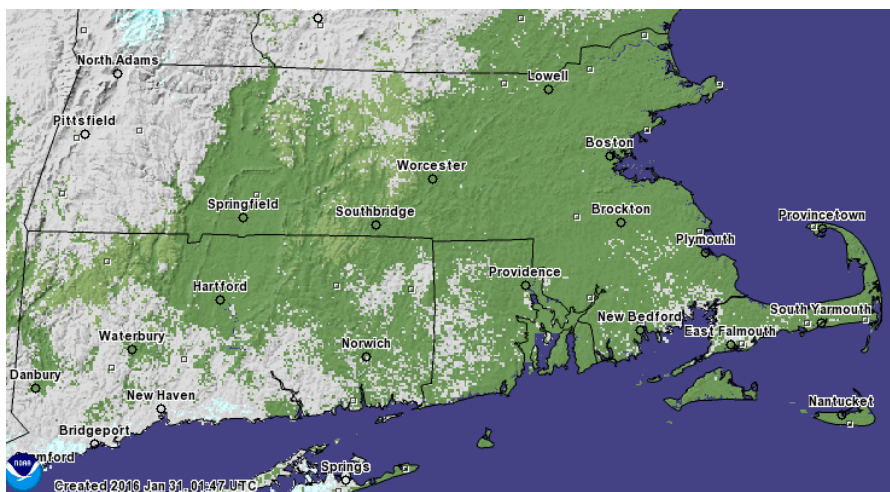
SNOW



Season-to-date snowfall departure

At the end of January the season-to-date snowfall departure ranged from above six to below six inches across the state.

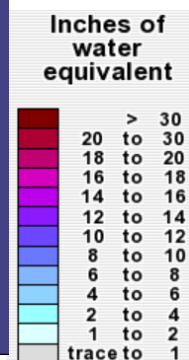
<http://www.nrcc.cornell.edu/regional/monthly/monthly.html>



Snow cover

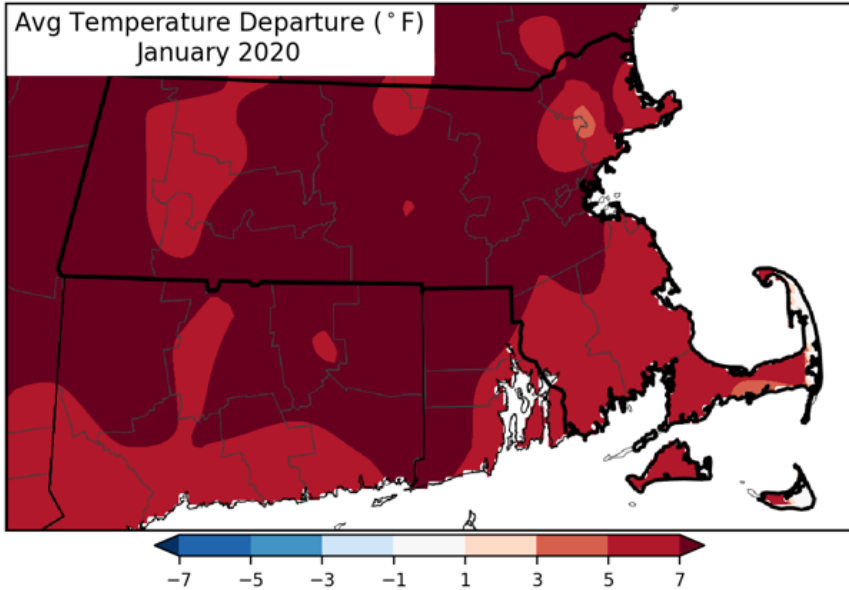
At the end of January, trace amounts of snow remained in the northern and western portions of the state.

<https://www.nohrsc.noaa.gov/interactive/html/map.html>



TEMPERATURE

Avg Temperature Departure (° F)
January 2020



Monthly average temperatures were well above historical averages for this time of the year.

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

According to NOAA, Boston had its 3rd warmest January on record and Worcester had its 10th warmest.

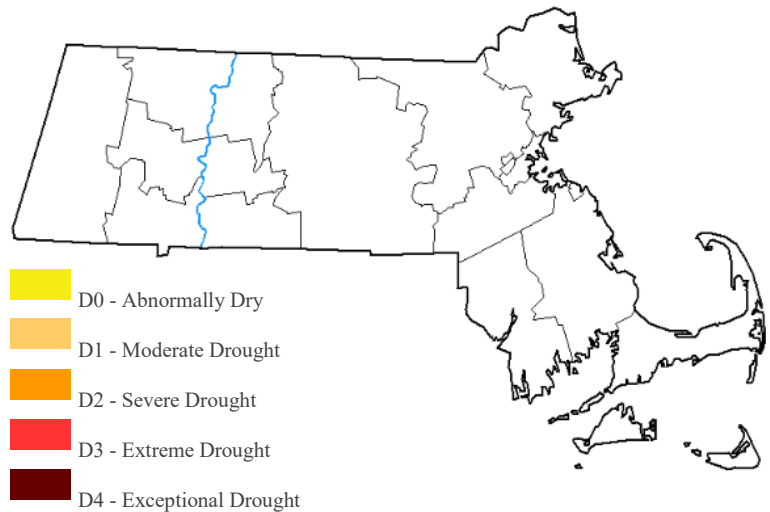
Daily temperatures ranged from 14 to 74 degrees Fahrenheit (deg F). Daily departures from historical averages ranged from +30.7 to -5.6 deg F.

DROUGHT CONDITIONS AND FORECASTS BY NOAA AND PARTNERS

U.S. Drought Monitor as of January 28, 2020

Summary: The USDM does not show drought conditions at the end of January.

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



NOAA Climate Prediction Center: Temperature and Precipitation Outlook

February: The outlook projects 33% chance of above normal temperatures and equal chances for below-normal, normal, or above-normal precipitation.

February through April: The outlook projects 33% chance of above normal temperatures and equal chances for below-normal, normal, or above-normal precipitation.

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

Monthly and Seasonal Drought Outlook

The monthly outlook for February and the seasonal outlook valid through April do not project drought conditions. <http://www.cpc.ncep.noaa.gov/products/Drought/>

This report was prepared by the Massachusetts Department of Conservation and Recreation. Data may be preliminary. Additional information, previous reports, and drought management information can be found at <https://www.mass.gov/water-data-tracking>.

Appendix I— Additional Precipitation Data

Standardized Precipitation Index January 2020

Drought Region	Number of Sites	SPI1	SPI2	SPI3	SPI6	SPI9	SPI12	SPI24	SPI36
Western	4	-0.89	0.09	0.26	0.05	-0.08	-0.06	0.91	0.79
Connecticut River	11	-0.91	0.52	0.23	-0.20	-0.23	-0.15	1.30	1.08
Central	12	-0.94	0.46	0.08	0.24	0.40	0.67	1.73	1.49
Northeast	14	-1.11	0.30	0.10	0.04	0.35	0.52	1.30	0.96
Southeast	19	-1.55	0.30	0.29	-0.01	0.38	0.57	1.57	1.28
Cape Cod	2	-0.82	1.22	0.75	0.79	0.95	0.93	1.35	1.53
Islands	2	-1.42	0.59	0.11	0.55	0.65	0.76	1.55	1.84

Key to Drought Plan SPI Severity Levels	
0	>-0.52
1	≤ -0.52 and > -0.84
2	≤ -0.84 and > -1.28
3	≤ -1.28 and > -2.05
4	≤ -2.05

Percent of Average Historical Precipitation

Drought Region	Number of Sites	Historical Average (inches)	January Average (inches)	Departure from Historical (inches)	Percent of Historical
Western	4	2.97	1.85	-1.12	61
Connecticut River	11	3.33	1.90	-1.43	57
Central	12	3.45	1.85	-1.60	54
Northeast	14	3.50	1.58	-1.92	45
Southeast	19	3.96	1.63	-2.33	41
Cape Cod	2	3.95	2.63	-1.31	68
Islands	2	3.38	1.71	-1.66	51

DCR Precipitation Reports are available at: <https://www.mass.gov/service-details/precipitation-composite-estimates-1> and <https://www.mass.gov/service-details/standardized-precipitation-index-spi-0>

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.

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

Index Severity Levels (Section 3.4 of the DMP)

Severity Level	Standardized Precipitation	Stream-flow	Lakes and Impoundments	Ground-water	Keetch-Byram Drought	Crop Moisture
0	>30 th percentile				< 200	> -1.0
1	≤30 and >20				200-400	≤-1.0 and > -2.0
2	≤20 and >10				400-600	≤-2.0 and < -3.0
3	≤10 and >2				600-700	≤ -3.0 and > -4.0
4	≤2				700-800	≤-4.0