

Current Hydrologic Conditions in Massachusetts

Drought Management Task Force

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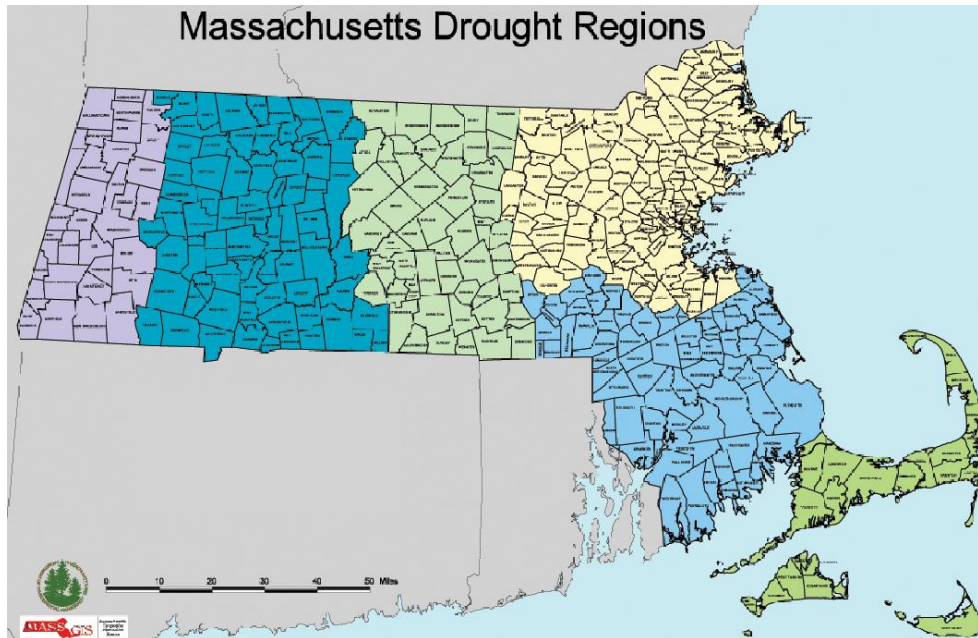
February 7, 2017

MA Drought Management Plan 2013

Drought Indicators
Precipitation
Precipitation
Streamflow
Groundwater
Reservoirs
Crop Moisture
Fire Danger



Drought Levels
Normal
Advisory
Watch
Warning
Emergency



Western
Connecticut River Valley
Central
Northeast
Southeast
Cape and Islands

Precipitation

Region	Estimated Rainfall (inches)	Departure from Average December (inches)	MA Drought Plan Levels	
			Standardized Precipitation Index (SPI)	Percent of Normal Index
Western	3.71	0.61	Normal	Normal
CT River Valley	3.08	-0.33	Advisory (12 mo)	Normal
Central	3.44	-0.32	Advisory (12 mo)	Normal
Northeast	4.21	0.64	Advisory (12 mo)	Normal
Southeast	5.30	1.40	Normal	Normal
Cape Cod & Islands	6.26	2.39	Normal	Normal

Reservoirs

Region	Number of Reservoirs Reporting	Reservoir Levels	MA Drought Management Plan Reservoir Index
Western	2	Normal	Normal
CT River Valley	2	Below	Warning*/Watch
Central	3	Below	Advisory
Northeast	7	Normal	Normal
Southeast	4	Below**	Watch
Cape Cod & Islands	1	Normal	Normal

*Quabbin reservoir is slightly below normal. This is a large reservoir which jumps the index to warning. The other monitored reservoir in the CT River Valley region is below normal and a medium reservoir; therefore, it indicates a watch drought category.

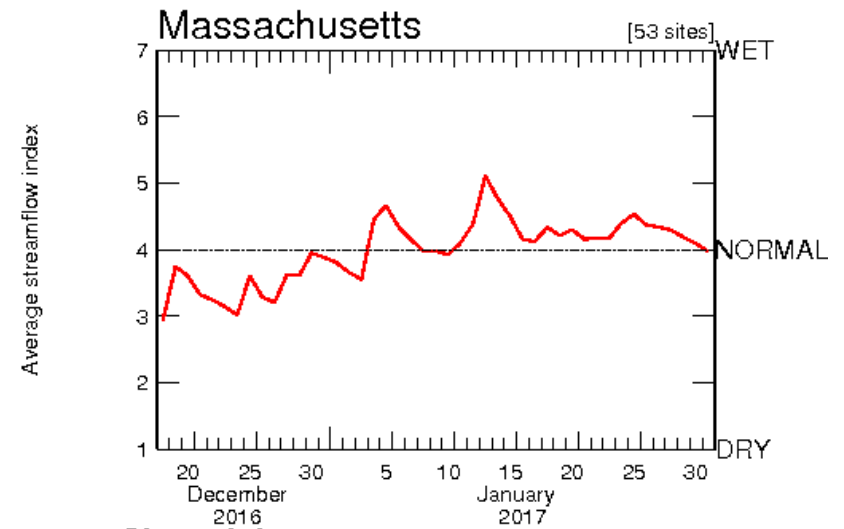
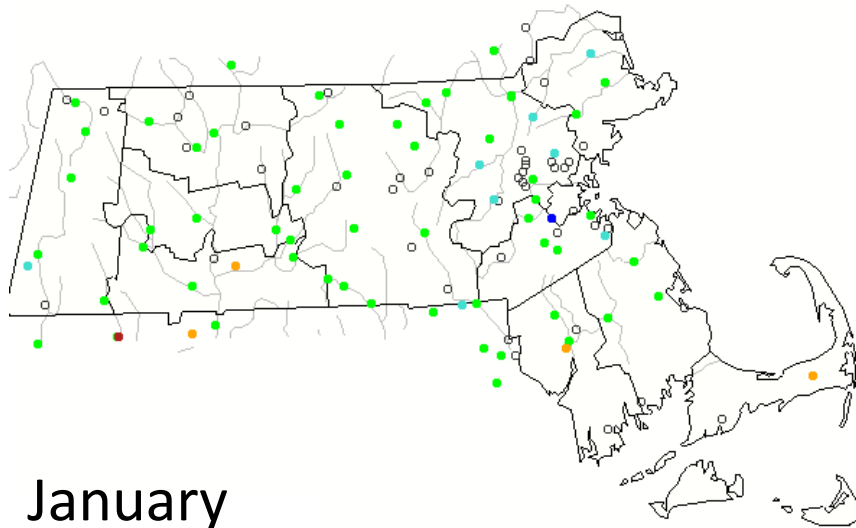
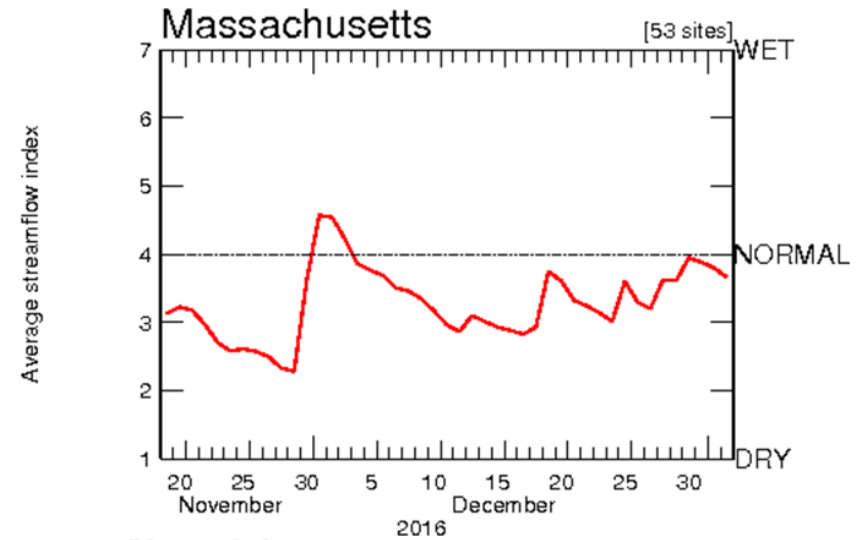
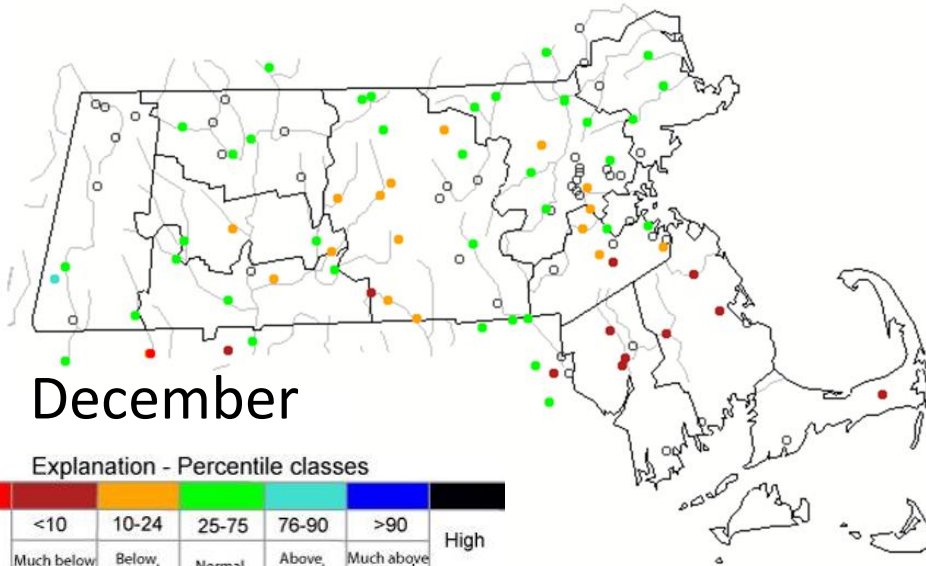
** One medium reservoir is at 2 standard deviations below normal.

Streamflow Compared to Historical



Average Monthly

Average Daily



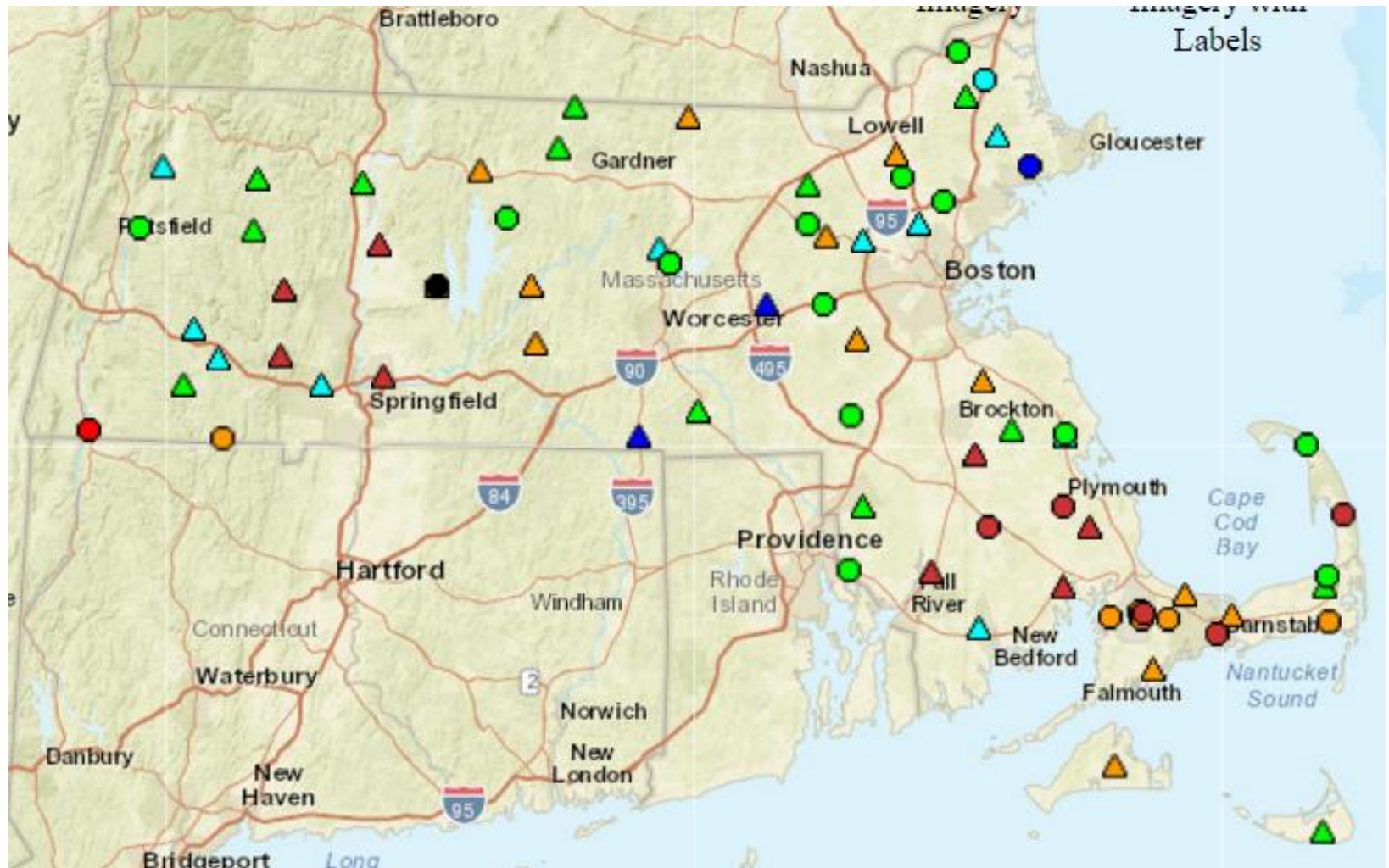
Streamflow

Region	Month	Number of gages*				MA Drought Plan Index (# months majority below 25 th percentile)
		Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
Western	December	5	1	1	1	2 of 3
	January	6	0	0	0	0
CT River Valley	December	11	3	0	0	6 of 7
	January	11	1	0	0	0
Central	December	16	8	1	0	6 of 7
	January	16	0	0	0	0
Northeast	December	19	7	1	0	0
	January	19	0	0	0	0
Southeast	December	6	6	6	0	8 of 8
	January	6	1	0	0	6 of 7

*Number of gages is a non-cumulative count except for “total reporting” column.

**Data are not always available for all gages at time of reporting due to ice, beaver dams or other conditions.

Groundwater



Groundwater

Region	Month	Number of wells*				MA Drought Plan Index (# consecutive months majority below 25 th percentile)
		Total Reporting**	10-25th percentile	Below 10 th percentile	At Record Low	
Western	December	5	2	0	1	10
	January	5	0	0	1	0
CT River Valley	December	11	1	2	4	9
	January	11	1	2	2	0
Central	December	10	3	1	0	0
	January	10	3	0	0	0
Northeast	December	17	5	2	0	0
	January	17	4	0	0	0
Southeast	December	12	1	8	1	8
	January	12	0	5	1	0
Cape and Islands	December	12	1	5	0	1
	January	12	7	1	0	2

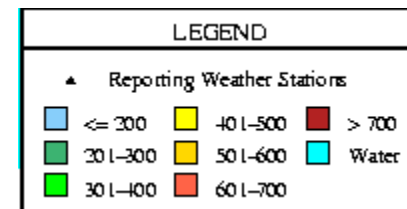
*Number of wells is a non-cumulative count except for “total reporting” column.

**Data are not always available for all wells in time for reporting.

Crop Moisture and KBDI/Fire

Region	MA Drought Plan Index
Western	Normal
CT River Valley	Normal
Central	Normal
Northeast	Normal
Southeast	Normal
Cape and Islands	Normal

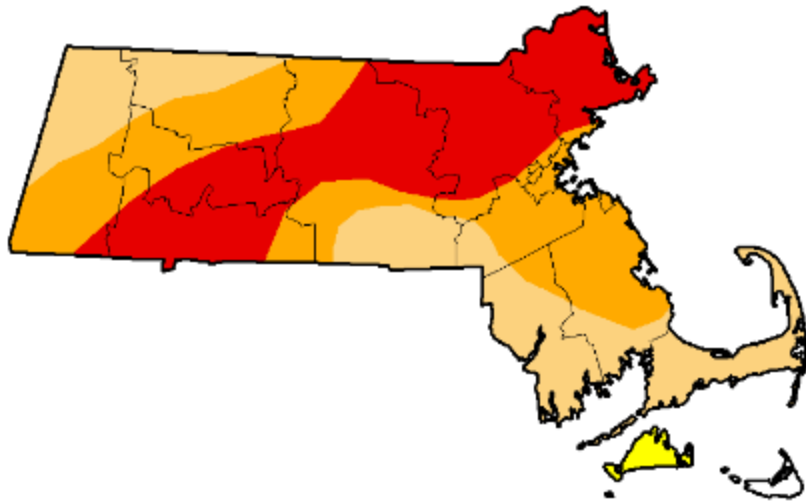
Region	MA Drought Plan Index
Western	Normal
CT River Valley	Normal
Central	Normal
Northeast	Normal
Southeast	Normal
Cape and Islands	Normal



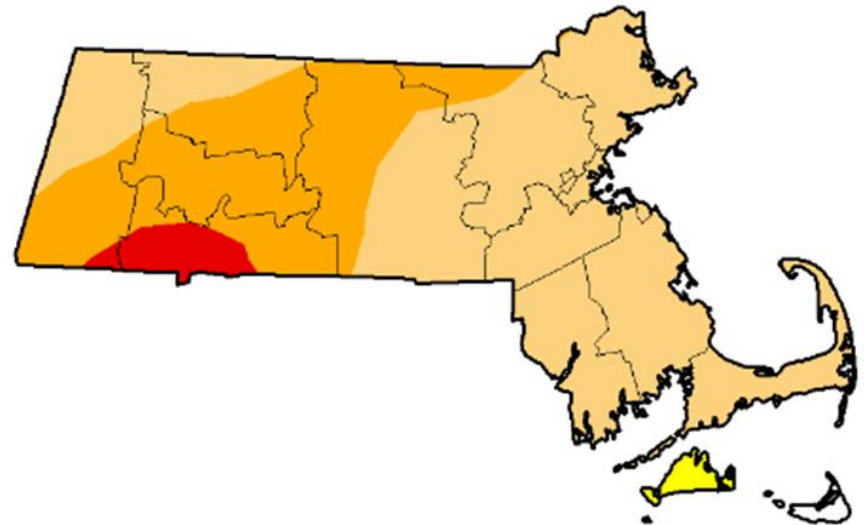
* The Crop Moisture Index is subject to frequent change. The drought level for this indicator is determined based on the repeated or extended occurrence at a given level. This indicator is most relevant during the growing season.

US Drought Monitor


December 27, 2016




January 31, 2017



Intensity:

 D0 (Abnormally Dry)

 D2 (Severe Drought)

 D4 (Exceptional Drought)

 D1 (Moderate Drought)

 D3 (Extreme Drought)

West - Summary of Drought Indices

- Normal precipitation for all look-back periods.

Month	Number of streamflow gages*				MA Drought Plan Index (# months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	5	1	1	1	2 of 3
January	6	0	0	0	0

*Number of gages is a non-cumulative count except for “total reporting” column.

**Data are not always available for all gages at time of reporting due to ice, beaver dams or other conditions.

Month	Number of groundwater wells*				MA Drought Plan Index (# consecutive months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	5	2	0	1	10
January	5	0	0	1	0

*Number of wells is a non-cumulative count except for “total reporting” column.

**Data are not always available for all wells in time for reporting.

- Both reservoirs have returned to normal.

Drought Indicator	Status
Standardized Precipitation Index	Normal
Percent of Normal Precipitation	Normal
Streamflow	Normal
Groundwater	Normal
Reservoir	Normal
Crop Moisture Index	Normal
KBDI - Fire danger	Normal
<i>December</i>	Warning
<i>Recommended January</i>	Watch/ Advisory

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CT River Valley - Summary of Drought Indices

- Below normal precipitation for 12-month look-back period.

Month	Number of streamflow gages*				MA Drought Plan Index (# months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	11	3	0	0	6 of 7
January	11	1	0	0	0

*Number of gages is a non-cumulative count except for "total reporting" column.

**Data are not always available for all gages at time of reporting due to ice, beaver dams or other conditions.

Month	Number of groundwater wells*				MA Drought Plan Index (# consecutive months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	11	1	2	4	9
January	11	1	2	2	0

*Number of wells is a non-cumulative count except for "total reporting" column.

**Data are not always available for all wells in time for reporting.

- Both reservoirs remain below normal.

Drought Indicator	Status
Standardized Precipitation Index	Advisory
Percent of Normal Precipitation	Normal
Streamflow	Normal
Groundwater	Normal ¹
Reservoir	Warning ² / Watch
Crop Moisture Index	Normal
KBDI - Fire danger	Normal
<i>December</i>	Warning
<i>Recommended January</i>	Warning/ Watch

¹ Some wells remain below normal; however, since the majority of wells in the region are not below normal, a drought level is not triggered.

² Quabbin reservoir is slightly below normal. This is a large reservoir which jumps the index to warning. The other monitored reservoir in the CT River Valley region is below normal and a medium reservoir; therefore, it indicates a watch drought level.

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Central - Summary of Drought Indices

- Below normal precipitation for 12-month look-back period.

Month	Number of streamflow gages*				MA Drought Plan Index (# months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	16	8	1	0	6 of 7
January	16	0	0	0	0

*Number of gages is a non-cumulative count except for "total reporting" column.

**Data are not always available for all gages at time of reporting due to ice, beaver dams or other conditions.

Month	Number of groundwater wells*				MA Drought Plan Index (# consecutive months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	10	3	1	0	0
January	10	3	0	0	0

*Number of wells is a non-cumulative count except for "total reporting" column.

**Data are not always available for all wells in time for reporting.

- One small reservoir remains below normal.

Drought Indicator	Status
Standardized Precipitation Index	Advisory
Percent of Normal Precipitation	Normal
Streamflow	Normal
Groundwater	Normal ¹
Reservoir	Advisory
Crop Moisture Index	Normal
KBDI - Fire danger	Normal
<i>December</i>	Warning
<i>Recommended January</i>	Watch

¹ Some wells remain below normal; however, since the majority of wells in the region are not below normal, a drought level is not triggered.

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Northeast - Summary of Drought Indices

- Below normal precipitation for 12-month look-back period.

Month	Number of streamflow gages*				MA Drought Plan Index (# months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	19	7	1	0	0
January	19	0	0	0	0

*Number of gages is a non-cumulative count except for "total reporting" column.

**Data are not always available for all gages at time of reporting due to ice, beaver dams or other conditions.

Month	Number of groundwater wells*				MA Drought Plan Index (# consecutive months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	17	5	2	0	0
January	17	4	0	0	0

*Number of wells is a non-cumulative count except for "total reporting" column.

**Data are not always available for all wells in time for reporting.

- All seven reservoirs have returned to normal.

Drought Indicator	Status
Standardized Precipitation Index	Advisory
Percent of Normal Precipitation	Normal
Streamflow	Normal
Groundwater	Normal ¹
Reservoir	Normal
Crop Moisture Index	Normal
KBDI - Fire danger	Normal
<i>December</i>	Watch
<i>Recommended January</i>	Advisory

¹ Some wells remain below normal; however, since the majority of wells in the region are not below normal, a drought level is not triggered.

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Southeast - Summary of Drought Indices

- Normal precipitation for all look-back periods.

Month	Number of streamflow gages*				MA Drought Plan Index (# months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	6	6	6	0	8 of 8
January	6	1	0	0	6 of 7

*Number of gages is a non-cumulative count except for “total reporting” column.

**Data are not always available for all gages at time of reporting due to ice, beaver dams or other conditions.

Month	Number of groundwater wells*				MA Drought Plan Index (# consecutive months majority below 25 th percentile)
	Total Reporting**	10-25 th percentile	Below 10 th percentile	At Record Low	
December	12	1	8	1	8
January	12	0	5	1	0

*Number of wells is a non-cumulative count except for “total reporting” column.

**Data are not always available for all wells in time for reporting.

- One medium reservoir remains below normal by two standard deviations.

Drought Indicator	Status
Standardized Precipitation Index	Normal
Percent of Normal Precipitation	Normal
Streamflow	Warning ¹
Groundwater	Normal ²
Reservoir	Watch
Crop Moisture Index	Normal
KBDI - Fire danger	Normal
	<i>December</i> Warning
	<i>Recommended January</i> Warning/Watch

1 Average streamflow for the month of January was normal (i.e., above the 25th percentile) for 5 gages and below 25th percentile for one gage. The region remains in warning because 6 of the last 7 months were below normal for the majority of the gages.

2 Some wells remain below normal; however, since the majority of wells in the region are not below normal, a drought level is not triggered.

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Cape & Islands - Summary of Drought Indices

- Normal precipitation for all look-back periods.

Month	Number of groundwater wells*				MA Drought Plan Index (# consecutive months majority below 25 th percentile)
	Total Reporting**	10-25th percentile	Below 10 th percentile	At Record Low	
December	12	1	5	0	1
January	12	7	1	0	2

*Number of wells is a non-cumulative count except for “total reporting” column.

**Data are not always available for all wells in time for reporting.

- One reporting reservoir has recovered from below normal to normal.

Drought Indicator	Status
Standardized Precipitation Index	Normal
Percent of Normal Precipitation	Normal
Streamflow	N/A
Groundwater	Normal ¹
Reservoir	Normal
Crop Moisture Index	Normal
KBDI - Fire danger	Normal
	<i>December</i> Advisory
	<i>Recommended January</i> Advisory

¹ Majority of the wells are below normal for second consecutive month; however, the DMP still categorizes these conditions as normal.

N/A indicates Not Applicable

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Summary of Drought Indices

Drought Indicator	West	CT River Valley	Central	Northeast	Southeast	Cape and Islands
Standardized Precipitation Index	Normal	Advisory	Advisory	Advisory	Normal	Normal
Percent of Normal Precipitation	Normal	Normal	Normal	Normal	Normal	Normal
Streamflow	Normal	Normal	Normal	Normal	Warning ³	N/A
Groundwater	Normal	Normal ¹	Normal ¹	Normal ¹	Normal ¹	Normal ⁴
Reservoir	Normal	Warning ²	Advisory	Normal	Watch	Normal
Crop Moisture Index	Normal	Normal	Normal	Normal	Normal	Normal
KBDI - Fire danger	Normal	Normal	Normal	Normal	Normal	Normal
<i>December</i>	Warning	Warning	Warning	Watch	Warning	Advisory
<i>Recommended January</i>	Watch	Warning	Watch	Advisory	Warning	Advisory

1 Some wells remain below normal; however, since the majority of wells in the region are not below normal, a drought level is not triggered.

2 Quabbin reservoir is slightly below normal. This is a large reservoir which jumps the index to warning. The other monitored reservoir in the CT River Valley region is below normal and a medium reservoir; therefore, it indicates a watch drought level.

3 Average streamflow for the month of January was normal (i.e., above the 25th percentile) for 5 gages and below 25th percentile for one gage. The region remains in warning because 6 of the last 7 months were below normal for the majority of the gages.

4 Majority of the wells are below normal for second consecutive month; however, the DMP still categorizes these conditions as normal.

This summary is provided for informational purposes. No changes in drought status are official until the Drought Management Task Force convenes and makes a recommendation accepted by Secretary of the Executive Office of Energy and Environmental Affairs. Data are preliminary and not final until all data are reported. N/A indicates Not Applicable