

MASSACHUSETTS WATER RESOURCES COMMISSION

Hydrologic Conditions in Massachusetts

December 2015 Summary



- December precipitation was above normal in all regions.
- December streamflows were below normal in the Central, Northeast, and Southeast regions.
- December groundwater levels were below normal in the Central, Northeast, and Southeast regions.
- December reservoir levels were below normal in the Central and Northeast regions.

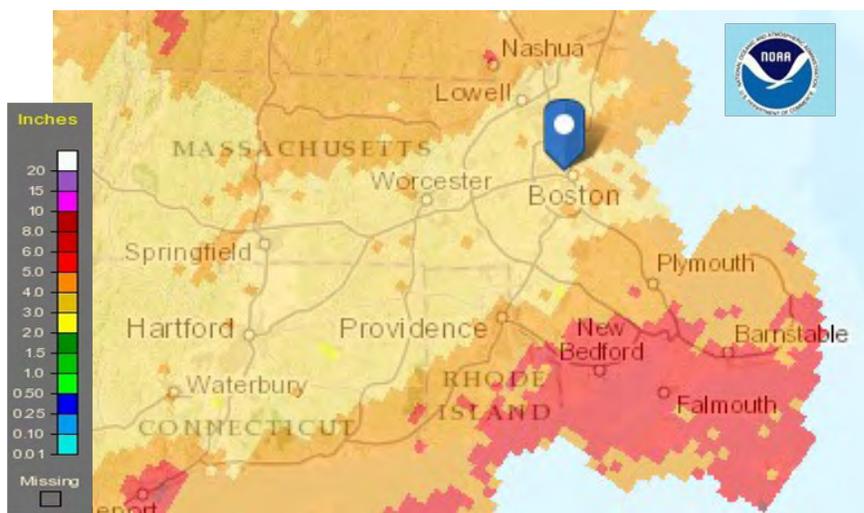
PRECIPITATION CONDITIONS

Summary: December precipitation was above normal.

| Region | December Estimated Rainfall: Composite Sites Reporting (inches) | Departure from Normal (inches) | MA Drought Management Plan Levels | |
|--------------------|---|--------------------------------|-----------------------------------|-------------------------|
| | | | Standardized Precipitation Index | Percent of Normal Index |
| Cape Cod & Islands | 5.31 | + 1.12 | Normal | Normal |
| Central | 4.89 | + 0.98 | Normal | Normal |
| Connecticut River | 4.70 | + 0.88 | Normal | Normal |
| Northeast | 4.36 | + 0.46 | Normal | Normal |
| Southeast | 4.71 | + 0.49 | Normal | Normal |
| Western | 3.69 | + 0.22 | Normal | Normal |

Dec 2015 Total Observed Rainfall from National Weather Service

found at <http://water.weather.gov/precip/> estimated from radar data correlated to NWS rainfall gauge reports



Weather Events of Note

Source: NWS Taunton E-5 Report

December 2015 has gone onto the record books as the warmest December on record for southern New England. All 4 major climate sites had a record smashing warm month, with temperatures averaging some 10 to 12 degrees F above normal. December will also be remembered for its lack of snow. Worcester had its latest measurable snowfall on record, with the month's sole 1.4" accumulating on December 29th. The previous latest measurable snowfall heading into a winter season for Worcester was December 24th, 1923.

STREAMFLOW CONDITIONS

Summary: December streamflow conditions were below normal in the Central, Northeast, and Southeast regions.

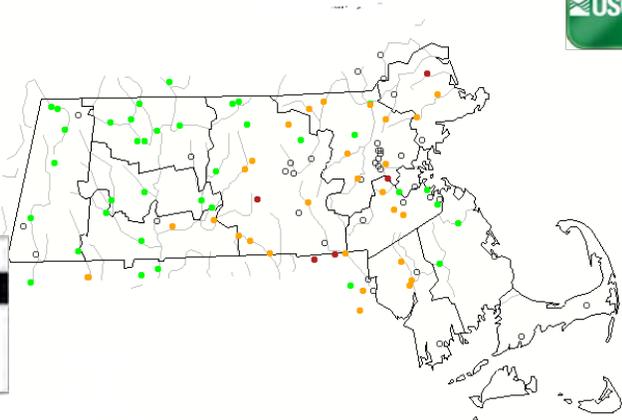
| General Streamflow Conditions in Massachusetts December 2015 | | |
|--|-----------------------|---|
| Region | Streamflow Conditions | MA Drought Management Plan Streamflow Index |
| Cape Cod & Islands | ND | ND |
| Central | Below Normal | Watch |
| Connecticut River | Normal | Normal |
| Northeast | Below Normal | Advisory |
| Southeast | Below Normal | Advisory |
| Western | Normal | Normal |

| Key to Levels |
|---------------|
| Normal |
| Advisory |
| Watch |
| Warning |
| Emergency |

Note: Streamflow conditions for individual streamflow-gaging stations may differ from general conditions. ND, no data

December 2015 Monthly Streamflow Compared to Historical November Streamflow

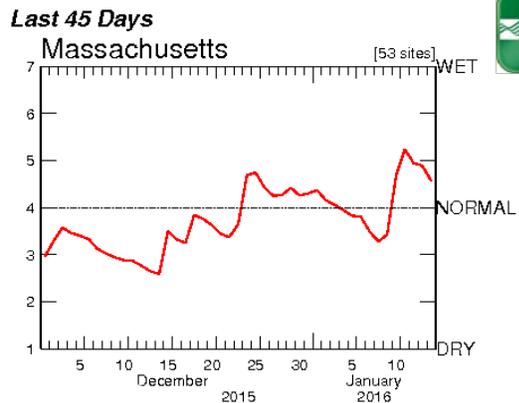
Average December 2015 streamflow monitored by the Commonwealth of Massachusetts and United States Geological Survey (USGS) cooperative stream gaging program. See map at right found at: <http://waterwatch.usgs.gov/index.php?r=ma&id=mv01d>



| Explanation - Percentile classes | | | | | |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|
| | | | | | |
| Low | <10 | 10-24 | 25-75 | 76-90 | >90 |
| | Much below normal | Below normal | Normal | Above normal | Much above normal |
| | | | | | High |

Time Series Plot of Real-Time Streamflow Compared to Historical Streamflow for the Day of the Year

This graph depicts a composite daily streamflow relative to normal streamflow for Massachusetts for the 45-day period of Dec. 1 to Jan. 13. An updated summary plot may be found at: <http://waterwatch.usgs.gov/index.php>



KEY:
 1 = New record low for day
 2 = < 10th percentile
 3 = 10th – 24th percentile
 4 = 25th – 74th percentile
 5 = 75th – 89th percentile
 6 = 90th percentile
 7 = New record high for day

GROUNDWATER LEVELS

Summary: December groundwater levels were below normal in the Central, Northeast, and Southeast regions, and normal for other regions.

General Groundwater Conditions in Massachusetts at the end of December 2015

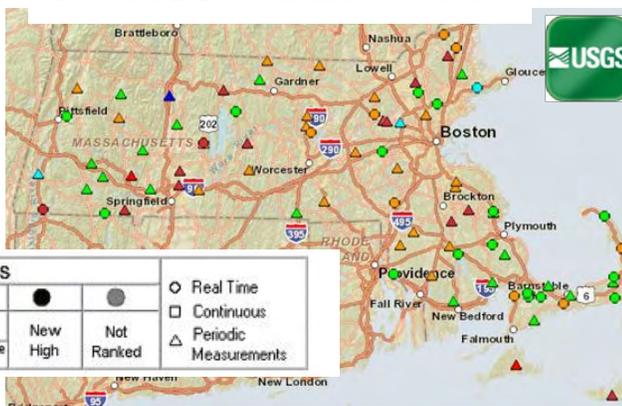
| Region | Groundwater Conditions | MA Drought Management Plan Groundwater Index |
|--------------------|------------------------|--|
| Cape Cod & Islands | Normal | Normal |
| Central | Below Normal | Normal |
| Connecticut River | Normal | Normal |
| Northeast | Below Normal | Advisory |
| Southeast | Below Normal | Normal |
| Western | Normal | Normal |

| Key to Levels |
|---------------|
| Normal |
| Advisory |
| Watch |
| Warning |
| Emergency |

Note: Groundwater conditions for individual wells may differ from general conditions. ND, no data

The USGS Groundwater Conditions for the end of December 2015 can be viewed at the web site: http://ma.water.usgs.gov/water_statement/2015_12/index.html

December 2015 Groundwater Conditions



| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-------------------|--------------|--------|--------------|-------------------|----------|------------|
| ● | ● | ● | ● | ● | ● | ● | ● |
| New Low | <10 | 10-24 | 25-75 | 76-90 | >90 | New High | Not Ranked |
| | Much Below Normal | Below Normal | Normal | Above Normal | Much Above Normal | | |

RESERVOIR LEVELS

Summary: December reservoir levels were below normal in the Central and Northeast regions based on percent full values, as reported by participating water suppliers.

General Reservoir Levels in Massachusetts at the end of December 2015

| Region | Reservoir Levels | MA Drought Management Plan Reservoir Index |
|--------------------|-----------------------------------|--|
| Cape Cod & Islands | Normal | Normal |
| Central | Medium Reservoirs Below Normal | Watch |
| Connecticut River | Normal | Normal |
| Northeast | Medium Reservoirs Below Normal | Watch |
| Southeast | Normal | Normal |
| Western | Normal | Normal |

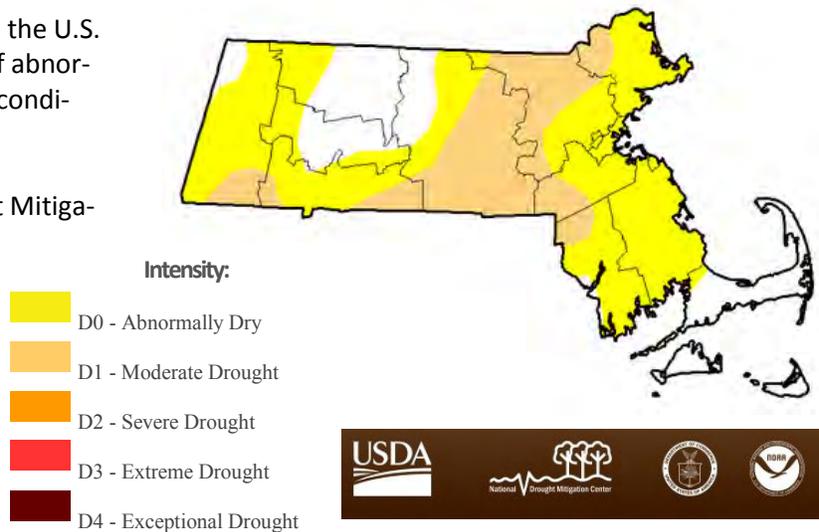
| Key to Levels |
|---------------|
| Normal |
| Advisory |
| Watch |
| Warning |
| Emergency |

NWS/NOAA DROUGHT OUTLOOK AND FORECAST

U.S. Drought Monitor: Massachusetts January 19, 2016

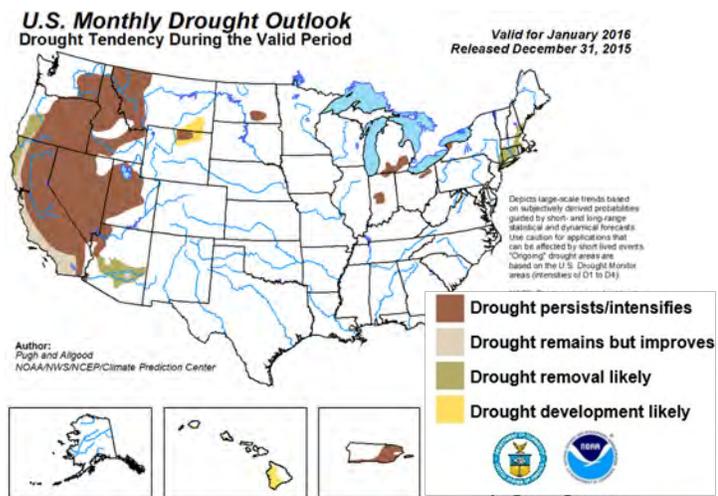
Summary: As of January 19, 2016, the U.S. Drought Monitor shows regions of abnormally dry and moderate drought conditions in Massachusetts.

Produced by the National Drought Mitigation Center (NDMC). Intensity based on NDMC criteria. For updated map see: <http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?MA>



Monthly Drought Outlook January 2016

The NOAA Monthly Drought Outlook (released Dec. 31, 2015 valid for January 2016) indicates drought removal likely in central Massachusetts. http://www.cpc.ncep.noaa.gov/products/expert_assessment/month_drought.png



NOAA NATIONAL WEATHER SERVICE CLIMATE PREDICTION CENTER

The Climate Prediction Center 6-10 day Outlook valid Jan. 26– Jan.30 shows above normal temperature and normal precipitation in the Massachusetts region. (<http://www.cpc.noaa.gov/products/predictions/610day/>). The Center's January 20th three-month outlook for February, March and April shows above normal temperatures and normal precipitation. (http://www.cpc.noaa.gov/products/predictions/long_range/seasonal.php?lead=1). More information is available at (<http://www.cpc.noaa.gov/index.php>).

Key Links: Massachusetts Drought Management Plan: <http://www.mass.gov/eea/docs/eea/wrc/droughtplan.pdf>

January 21, 2016: This report was prepared by the Massachusetts Department of Conservation and Recreation. Data may be preliminary in nature. Additional information, previous and future water conditions reports can be found on our web site: <http://www.mass.gov/eea/agencies/dcr/water-res-protection/water-data-tracking/precipitation-composite-current-conditions.html>