Precipitation was normal or near normal.
- Average monthly streamflows have improved to normal or near normal in all regions.
- Groundwater levels continue to recover with the Connecticut River Valley, Southeast and Cape & Islands slightly lagging in improvements.
- Reservoir levels are recovering. Impacts are still seen in the Connecticut River Valley, Central and Southeast regions.
- NOAA projects normal precipitation and temperatures for February.
- Drought effects continue to show in all regions. Appendix I provides values of indices not presented in the main report. Appendix II provides a description of the indices from the Drought Management Plan.

### PRECIPITATION

<table>
<thead>
<tr>
<th>Region</th>
<th>Estimated Rainfall (inches)</th>
<th>Departure from Average January (inches)</th>
<th>MA Drought Plan Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>3.71</td>
<td>0.61</td>
<td>Normal Normal</td>
</tr>
<tr>
<td>CT River Valley</td>
<td>3.08</td>
<td>-0.33</td>
<td>Advisory (12 mo) Normal</td>
</tr>
<tr>
<td>Central</td>
<td>3.44</td>
<td>-0.32</td>
<td>Advisory (12 mo) Normal</td>
</tr>
<tr>
<td>Northeast</td>
<td>4.21</td>
<td>0.64</td>
<td>Advisory (12 mo) Normal</td>
</tr>
<tr>
<td>Southeast</td>
<td>5.30</td>
<td>1.40</td>
<td>Normal Normal</td>
</tr>
<tr>
<td>Cape Cod &amp; Islands</td>
<td>6.26</td>
<td>2.39</td>
<td>Normal Normal</td>
</tr>
</tbody>
</table>

#### January 2017 Precipitation Departure from Normal

Map from the National Weather Service (NWS) Advanced Hydrologic Prediction Center [http://water.weather.gov/precip/](http://water.weather.gov/precip/)

The map is generated based on radar data correlated to NWS rainfall gauge reports.
STREAMFLOW


Some gages in the Northwest are not reporting due to ice conditions.

Average Monthly Streamflow Compared to Historical for the Month of the Year


Some gages in the Northwest are not reporting due to ice conditions.

Average Daily Streamflow Compared to Historical for the Day of the Year

This plot depicts data for the 45-day period ending January 31. http://waterwatch.usgs.gov/index.php?id=real&sid=w__plot&r=ma

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

Notes: Not all gages report in all months potentially due to ice, beaver dams or other conditions. Streamflow conditions for individual streamflow-gaging stations may differ from general conditions.
Groundwater Conditions in the Climate Response Network ending January 2017


Notes: *Number of wells are non-cumulative counts except for “total reporting”.

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

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

Summary: Massachusetts has 99 percent of its area in a drought with 37 percent remaining in a severe or extreme drought.

Produced by the National Drought Mitigation Center (NDMC). Intensity based on NDMC criteria. For a weekly updated map see:

NOAA: Monthly and Seasonal Drought Outlook

The February projection shows drought removal in the northwest and eastern parts of the state. Drought improvement is projected for central and southwestern Massachusetts. The three-month outlook suggests a similar pattern except for the Northeast where rather than drought removal, the drought may improve but remain.

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

February 2017

December 15, 2016 - March 31, 2017
Appendix I: Additional Information

Keetch-Byram Drought Index by DCR Forest Fire Control Districts
The fire index was below 300 in all drought regions which indicates “normal” conditions according to the Massachusetts Drought Management Plan.
http://www.wfas.net/index.php/keetch-byram-index-moisture--drought-49

Crop Moisture Index for the Week Ending January 28, 2016
The Crop Moisture Index shows the short-term need versus available water in a shallow soil profile. This index responds quickly to changing conditions and 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 growing season. http://www.cpc.noaa.gov/products/analysis_monitoring/regional_monitoring/cmi.gif

<table>
<thead>
<tr>
<th>Region</th>
<th>MA Drought Plan Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western</td>
<td>Normal</td>
</tr>
<tr>
<td>CT River Valley</td>
<td>Normal</td>
</tr>
<tr>
<td>Central</td>
<td>Normal</td>
</tr>
<tr>
<td>Northeast</td>
<td>Normal</td>
</tr>
<tr>
<td>Southeast</td>
<td>Normal</td>
</tr>
<tr>
<td>Cape and Islands</td>
<td>Normal</td>
</tr>
</tbody>
</table>
### Appendix II: Description of Drought Indices

(from Table 3 of Massachusetts Drought Management Plan).

<table>
<thead>
<tr>
<th>Drought Level</th>
<th>Standardized Precipitation Index</th>
<th>Crop Moisture Index*</th>
<th>Keetch-Byram Drought Index*</th>
<th>Precipitation</th>
<th>Groundwater</th>
<th>Streamflow</th>
<th>Reservoir***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>3-month &gt; -1.5 or 6-month &gt; -1.0 or 12-month &gt; -1.0</td>
<td>0.0 to -1.0</td>
<td>200</td>
<td>1 month below normal</td>
<td>2 consecutive months below normal**</td>
<td>1 month below normal**</td>
<td>Reservoir levels at or near normal for the time of year</td>
</tr>
<tr>
<td>Advisory</td>
<td>3-month = -1.5 to -2.0 or 6-month = -1.0 to -1.5 or 12-month = -1.0 to -1.5</td>
<td>-1.0 to -1.9 abnormally dry</td>
<td>200-400</td>
<td>2 month cumulative below 65% of normal</td>
<td>3 consecutive months below normal**</td>
<td>At least 2 out of 3 consecutive months below normal**</td>
<td>Small index Reservoirs below normal</td>
</tr>
<tr>
<td>Watch</td>
<td>3-month &lt; -2.0 or 6-month = -1.5 to -3.0 or 12-month = -1.5 to -2.0</td>
<td>-2.0 to -2.9 excessively dry</td>
<td>400-600</td>
<td>1 of the following criteria met: 3 month cum. &lt; 65% or 6 month cum. &lt; 70% or 12 month cum. &lt; 70%</td>
<td>4-5 consecutive months below normal**</td>
<td>At least 4 out of 5 consecutive months below normal**</td>
<td>Medium index Reservoirs below normal</td>
</tr>
<tr>
<td>Warning</td>
<td>6-month &lt; -3.0 or 12-month = -2.0 to -2.5</td>
<td>&lt; -2.9 severely dry</td>
<td>600-800</td>
<td>1 of the following criteria met: 3 month cum. &lt; 65% and 6 month cum. &lt;65%, or 6 month cum. &lt;65% and 12 month cum. &lt;65% or 3 month cum. &lt;65% and 12 month cum. &lt;65%</td>
<td>6-7 consecutive months below normal**</td>
<td>At least 6 out of 7 consecutive months below normal**</td>
<td>Large index reservoirs below normal</td>
</tr>
<tr>
<td>Emergency</td>
<td>12-month &lt; -2.5</td>
<td>&lt;-2.9 severely dry</td>
<td>600-800</td>
<td>Same criteria as Warning and previous month was Warning or Emergency</td>
<td>&gt;8 months below normal**</td>
<td>&gt;7 months below normal**</td>
<td>Continuation of previous month’s conditions</td>
</tr>
</tbody>
</table>

* 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.

** Below normal for groundwater and streamflow are defined as being within the lowest 25th percentile of the period of record.

*** Water suppliers should be consulted to determine if below normal reservoir conditions are due to operational issues.