

# Current Water Conditions in Massachusetts

## July 10, 2014



- June precipitation was much below normal in central and eastern regions
- June streamflows and ground water levels were normal
- Some reservoir levels were below normal in the Central, Northeast and Southeast regions at the end of June
- A minority of Drought Management Plan indices were tripping thresholds at the end of June in the Central, Northeast, Southeast, and Cape Cod/Islands regions. The conditions are expected to have been mitigated by July rainfall.

### Precipitation Conditions

Estimated June state-wide average precipitation is 2.92 inches, which is 76 percent of the long-term average for the month. The regions of Massachusetts received between 51 (Central) and 133 percent (West) of average precipitation during June. The MA Drought Management Plan precipitation index at the end of June was at the advisory level for Cape Cod and Islands. A table of June 2014 estimated precipitation statistics, based on preliminary precipitation data from the Department of Conservation and Recreation and National Weather Service precipitation monitoring networks, is attached. A map at the back of this report shows the distribution of June rainfall.

Thunderstorms and Hurricane Arthur have brought several inches of rain to Massachusetts during the beginning of July. Heavy rain associated with Hurricane Arthur caused urban flooding in Southeast Massachusetts. National Weather Service storm reports indicate that Cape Cod received one to five inches of rain and Southeast MA received two to eight inches of rain from Hurricane Arthur. A microburst associated with severe thunderstorms on July 7, 2014 was confirmed by National Weather Service in Bedford, MA, and straight-line wind damage occurred in many locations within Massachusetts on that date.

Soil moisture levels for Massachusetts at the end of June are reported as above normal in the west and southeast regions, and normal for the remaining areas.

### Ground-Water Levels

Ground-water levels reported by the U.S. Geological Survey at the end of June were generally in the normal range statewide. An assessment of ground-water conditions in the Massachusetts drought regions is shown in a table at the end of this report. The USGS Groundwater Conditions for the end of June 2014 can be viewed at the web site: <http://groundwaterwatch.usgs.gov/StateMapsNet.asp?ncd=crn&sc=25>



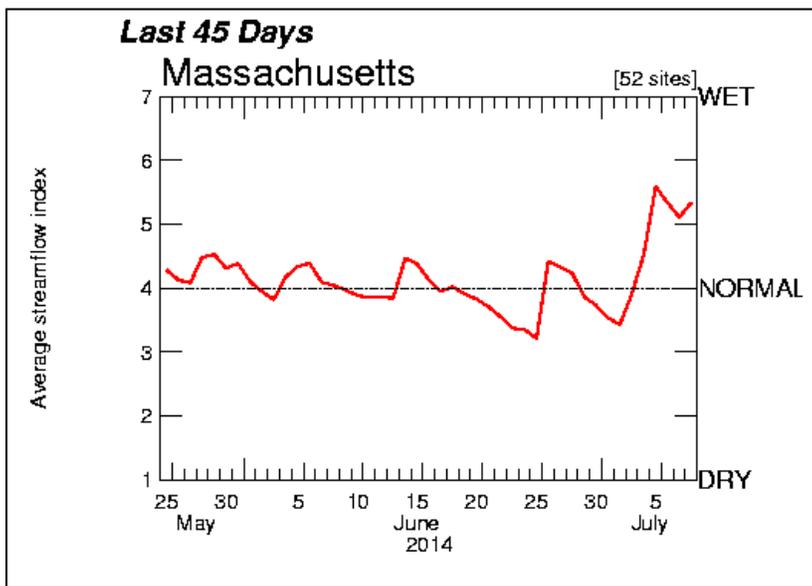
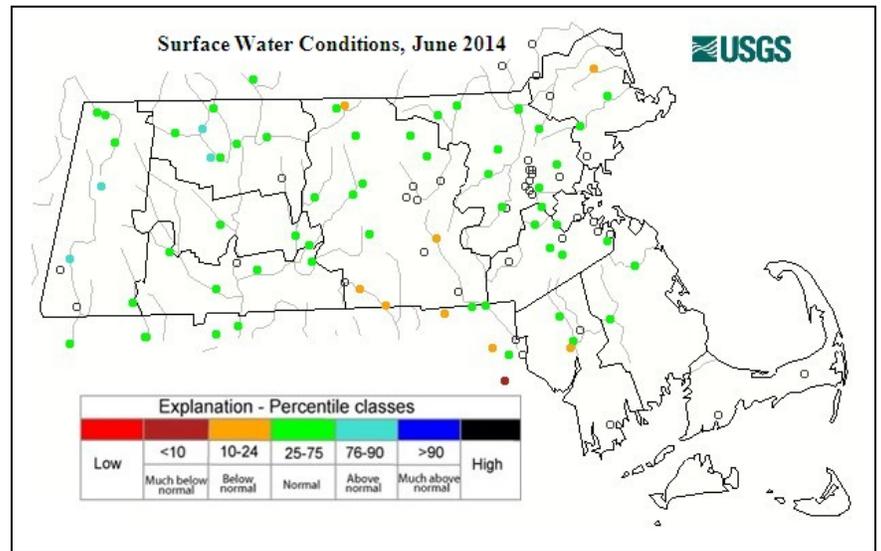
## Streamflow

Average June 2014 streamflows monitored by the Commonwealth of Massachusetts and United States Geological Survey (USGS) cooperative stream gaging program were generally normal.

The graph below depicts a composite daily streamflow relative to normal streamflow for Massachusetts for the period of May 25 to July 7, 2014. Flows were mostly in the near normal range during June, with a decline to the low normal range at the end of the month. The rise in flow starting on June 25 was the result of convective rain from a cold front that impacted mainly western parts of the state. The effects of rain associated with another frontal passage and Hurricane Arthur are evident after July 1. The graph is a composite of 52 real-time gages across the state with a long period of record.

This streamflow plot can be found at:

[http://waterwatch.usgs.gov/index.php?map\\_type1=pa07d&map\\_type2=&map\\_type3=&map\\_type4=&web\\_type=pa07d%2Cplot&state=ma&huc=us&xinfo=&map\\_type=real&group\\_idx=1&region\\_cd=ma&group\\_idx\\_changed=1&sel\\_nm=map\\_type1&sel\\_va=real](http://waterwatch.usgs.gov/index.php?map_type1=pa07d&map_type2=&map_type3=&map_type4=&web_type=pa07d%2Cplot&state=ma&huc=us&xinfo=&map_type=real&group_idx=1&region_cd=ma&group_idx_changed=1&sel_nm=map_type1&sel_va=real)



### KEY:

- 1 = New record low for day
- 2 = < 10<sup>th</sup> percentile
- 3 = 10<sup>th</sup> – 24<sup>th</sup> percentile
- 4 = 25<sup>th</sup> – 74<sup>th</sup> percentile
- 5 = 75<sup>th</sup> – 89<sup>th</sup> percentile
- 6 = ≥ 90<sup>th</sup> percentile
- 7 = New record high for day

## Reservoir Levels

Selected surface water reservoir percent-full values for water supply sources provided by water suppliers are listed below. The reservoir percent-full values listed are for the end of June or the beginning of July 2014. In the Central region, one small reservoir and one medium reservoir in the monitoring system are below normal. In the Northeast region, two of four of the small and half the medium sized reservoirs that are tracked are below normal. In the Southeast Region, three small and medium reservoirs monitored are below normal.

*June /July 2014 Massachusetts Reservoir Status*

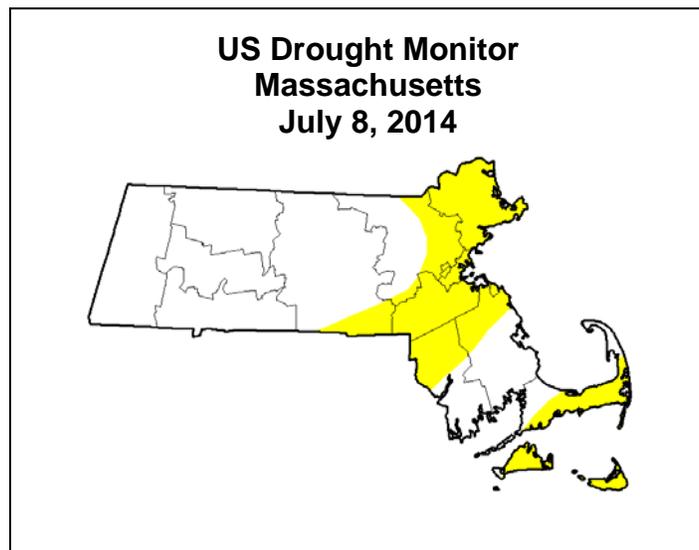
Reservoir/City or Town	Percent Full	Reservoir/City or Town	Percent Full
Quabbin	96.7	Beverly/Salem	97
Worcester	90.7	Lynn	77.5
Cobble Mt./ Springfield	92.4	Taunton/New Bedford/Assawompsett	91

Note: NA Indicates data not available for this report

## Drought Indices/Forecasts

### US Drought Monitor

The National Drought Mitigation Center's (NDMC's) July 8, 2014 Drought Monitor Map shown at right indicates abnormally dry conditions in parts of eastern Massachusetts, Cape Cod, and the Islands

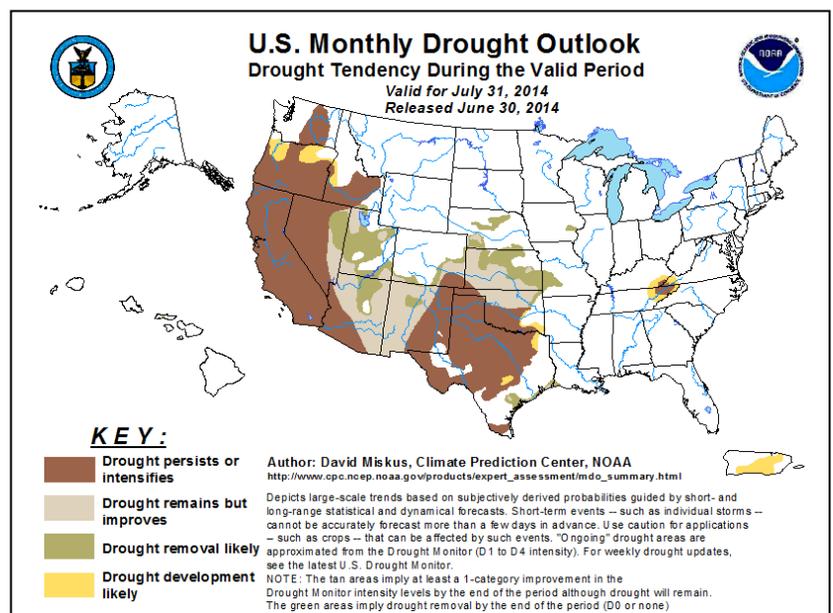


### Standardized Precipitation Index (SPI)

All the Standardized Precipitation Index values for the regions used for the Massachusetts Drought Management Plan are in the normal range with the exception of the Cape Cod region, where the 12-month Massachusetts SPI was in the Advisory Level for the state Drought Management Plan at the end of June.

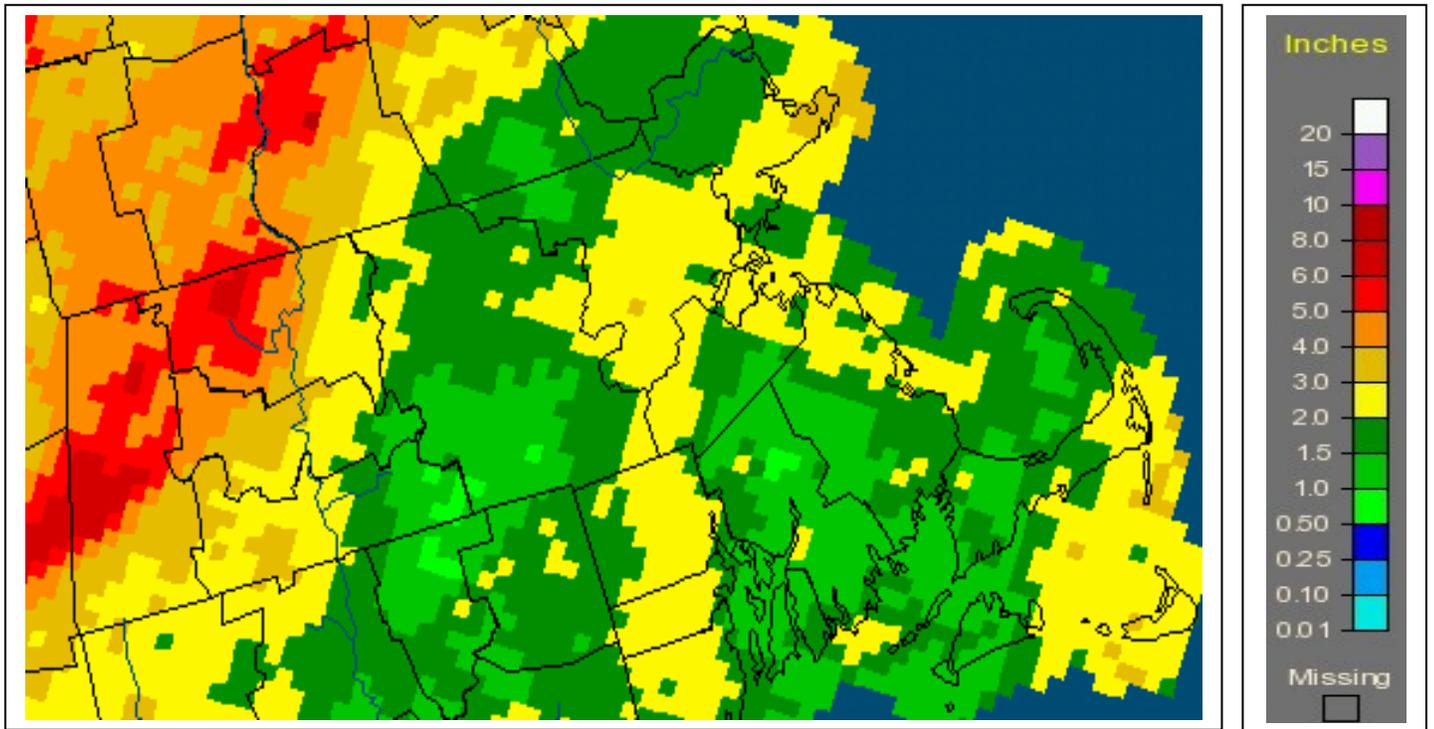
### NWS/NOAA's Climate Prediction Center

The U.S. Monthly Drought Outlook for July (shown at the right) forecasts normal conditions at the end of the month. The seasonal drought outlook (not shown) predicts that there will be no drought condition through the end of September in Massachusetts.



### Extended Forecasts

Another 1 to 2 inches of rain are forecast for the next 7 days in Massachusetts (Sunday through Tuesday). The National Weather Service Climate Prediction Center's extended forecasts through the next 14 days are for normal rainfall and below normal temperatures. The 1- and 3-month forecasts give no tendency for rainfall or temperature. The NWS Climate Prediction Center Information can be found at: <http://www.cpc.noaa.gov/index.php>



<http://water.weather.gov/precip/>

**TOTAL RAINFALL  
JUNE 2014**



**GENERAL WATER CONDITIONS IN MASSACHUSETTS - JUNE 2014**  
EOEEA and MEMA DROUGHT MANAGEMENT PLAN REGIONS

Massachusetts Regions	Surface-Water Conditions	Ground-Water Conditions
Cape and Islands	ND	Normal
Southeast	Normal	Normal
Northeast	Normal	Normal
Central	Normal	Normal
Connecticut River	Normal	Normal
Western	Normal	Normal

**Note:** Surface- and ground-water conditions for individual streamflow-gaging stations and wells may differ from general conditions. ND, no data

This report was prepared by the Massachusetts Department of Conservation and Recreation. Data were obtained from the sources described in the report and 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>

THE FOLLOWING ARE UNOFFICIAL RAIN AND WIND OBSERVATIONS FOR [HURRICANE](#)  
 ARTHUR ON JULY 4TH 2014. APPRECIATION IS EXTENDED TO [SKYWARN](#)  
 SPOTTERS...COOPERATIVE OBSERVERS...MEDIA AND HIGHWAY DEPARTMENTS FOR  
 THESE REPORTS. THIS SUMMARY IS ALSO AVAILABLE ON OUR HOME PAGE AT  
 WEATHER.GOV/BOSTON

\*\*\*\*\*STORM TOTAL [RAINFALL](#)\*\*\*\*\*

LOCATION	STORM TOTAL <a href="#">RAINFALL</a> /INCHES/	TIME/DATE OF MEASUREMENT	COMMENTS
MASSACHUSETTS			
...BARNSTABLE COUNTY...			
BOURNE	5.30	650 PM 7/04	AMATEUR RADIO
SANDWICH	4.73	832 AM 7/05	CWO
CHATHAM	2.60	931 AM 7/05	<a href="#">NWS</a> OFFICE
2 NE HYANNIS	2.30	930 AM 7/05	<a href="#">ASOS</a>
...BRISTOL COUNTY...			
NEW BEDFORD	8.20	1030 PM 7/04	TRAINED SPOTTER
3 NW NEW BEDFORD	6.36	928 AM 7/05	<a href="#">ASOS</a>
FAIRHAVEN(POPE BEACH	6.34	555 AM 7/05	HAM RADIO
ACUSHNET	6.14	757 AM 7/05	NONE
WEST ACUSHNET	6.14	704 AM 7/05	HAM RADIO
FAIRHAVEN	5.73	645 PM 7/04	AMATEUR RADIO
FAIRHAVEN (POPE BEAC	5.50	520 PM 7/04	HAM RADIO
DARTMOUTH	4.73	643 PM 7/04	AMATEUR RADIO
FALL RIVER	4.25	108 AM 7/05	TRAINED SPOTTER
MANSFIELD	2.83	916 AM 7/05	NONE
DIGHTON	2.72	827 PM 7/04	<a href="#">NWS</a> EMPLOYEE
NORTON	2.36	933 AM 7/05	COOP
TAUNTON	2.30	852 AM 7/05	<a href="#">NWS</a> OFFICE
...DUKES COUNTY...			
3 S VINEYARD HAVEN	1.58	929 AM 7/05	<a href="#">ASOS</a>
...NANTUCKET COUNTY...			
2 ESE NANTUCKET	1.89	928 AM 7/05	<a href="#">ASOS</a>
...PLYMOUTH COUNTY...			
PLYMOUTH	7.20	534 PM 7/04	SOUTH PLYMOUTH SPOTTER
MARION	5.90	1123 PM 7/04	NONE
WEST WAREHAM	5.29	1043 PM 7/04	AMATEUR RADIO
LAKEVILLE	4.60	1117 PM 7/04	TRAINED SPOTTER
MARSHFIELD	4.45	705 AM 7/05	NONE
4 SW PLYMOUTH	4.44	929 AM 7/05	<a href="#">ASOS</a>
WEST WAREHAM (ROSE P	4.20	1123 PM 7/04	TRAINED SPOTTER
WAREHAM	3.50	826 PM 7/04	AMATEUR RADIO
HALIFAX	3.24	509 AM 7/05	NONE
DUXBURY	2.90	655 PM 7/04	AMATEUR RADIO
HINGHAM	2.68	710 AM 7/05	NONE
SCITUATE	2.45	1045 PM 7/04	AMATEUR RADIO
KINGSTON	2.43	942 PM 7/04	TRAINED SPOTTER
EAST WAREHAM	2.40	240 PM 7/04	AMATEUR RADIO
BROCKTON	2.15	1021 PM 7/04	NONE
...SUFFOLK COUNTY...			
1 N EAST BOSTON	2.23	905 AM 7/05	AIRPORT

PUBLIC INFORMATION STATEMENT

NATIONAL WEATHER SERVICE TAUNTON MA  
304 PM EDT TUE JUL 8 2014

...MICROBURST /STRAIGHT LINE WIND DAMAGE/ CONFIRMED NEAR  
BEDFORD IN MIDDLESEX COUNTY MA...

LOCATION...BEDFORD IN MIDDLESEX COUNTY MA  
DATE...JULY 7 2014  
ESTIMATED TIME...540 PM EDT  
ESTIMATED MAXIMUM WIND SPEED...100 MPH  
MAXIMUM PATH WIDTH...0.50 MILE  
PATH LENGTH...2.5 MILES  
BEGINNING LAT/LON...42.50N / 71.28W  
ENDING LAT/LON...42.51N / 71.24W  
\* FATALITIES...0  
\* INJURIES...0

\* THE INFORMATION IN THIS STATEMENT IS PRELIMINARY AND SUBJECT TO  
CHANGE PENDING FINAL REVIEW OF THE EVENT AND PUBLICATION IN NWS  
STORM DATA.

...SUMMARY...

THE NATIONAL WEATHER SERVICE IN TAUNTON MA HAS CONFIRMED A  
MICROBURST /STRAIGHT LINE WIND DAMAGE/ NEAR BEDFORD IN MIDDLESEX  
COUNTY MA ON JULY 7 2014.

THE NATIONAL WEATHER SERVICE CONDUCTED A SURVEY OF THE DAMAGE  
THAT OCCURRED FROM SEVERE THUNDERSTORMS IN BEDFORD MASSACHUSETTS  
AT APPROXIMATELY 540 TO 545 PM ON MONDAY JULY 7. WE HAVE CONCLUDED  
THAT A VERY POWERFUL MICROBURST...STRAIGHT LINE WINDS...CARVED A  
PATH ACROSS THE CENTER OF THE TOWN...WITH THE TREES BLOWN DOWN IN  
A NORTHWEST TO SOUTHEAST DIRECTION. THE WINDS ARE ESTIMATED TO  
HAVE REACHED 90 TO 100 MPH.

APPROXIMATELY 50 TO 70 TREES WERE BLOWN DOWN. MOST OF THEM WERE  
HEALTHY PINE TREES THAT WERE 100 FEET TALL. THE TREES WERE BLOWN  
DOWN...SNAPPED AT LEAST HALF WAY UP...OR UPROOTED. APPROXIMATELY  
8 TREES FELL ONTO HOUSES CAUSING SIGNIFICANT DAMAGE. ON HILLTOP  
DRIVE AND HEMLOCK LANE ALONE...MORE THAN TWO DOZEN PINE TREES WERE  
KNOCKED DOWN.

MANY OTHER TOWNS IN EASTERN MASSACHUSETTS SUFFERED WIND DAMAGE ON  
JULY 7TH AND...WHILE WE WERE NOT ABLE TO SURVEY EVERY TOWN...IT  
IS LIKELY THAT ALL OF THE DAMAGE WAS FROM STRAIGHT LINE WINDS.  
THERE WERE NO EYEWITNESS REPORTS OF ANY TORNADOES. HOWEVER THERE  
WERE MANY IMAGES OF WHAT APPEARED TO BE A FUNNEL CLOUD IN THE  
MEDFORD AND MALDEN AREAS AROUND 6 PM.

THE NATIONAL WEATHER SERVICE WOULD LIKE TO THANK THE BEDFORD PUBLIC  
WORKS DIRECTOR...FIRE CHIEF AND TOWN MANAGER FOR ASSISTING WITH  
THE DAMAGE SURVEY. WE WOULD ALSO LIKE TO THANK OUR SKYWARN AMATEUR  
RADIO COORDINATORS AND SPOTTERS FOR ALL OF YOUR TIMELY REPORTS AND  
PHOTOS.

FOR REFERENCE...

A MICROBURST IS A SUDDEN DOWNRUSH OF AIR FROM A SEVERE THUNDERSTORM  
CAUSING A CONCENTRATED DAMAGE SWATH THAT IS UP TO 2.5 MILES LONG.  
STRAIGHT LINE WINDS ARE GENERALLY ANY WIND THAT IS NOT ASSOCIATED  
WITH ROTATION...USED MAINLY TO DIFFERENTIATE THEM FROM TORNADIC  
WINDS.

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JWD/SR

FOR THE LATEST UPDATES...PLEASE VISIT OUR WEBPAGE AT  
WWW.WEATHER.GOV/BOSTON