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# Streamflow and Groundwater Conditions in Massachusetts

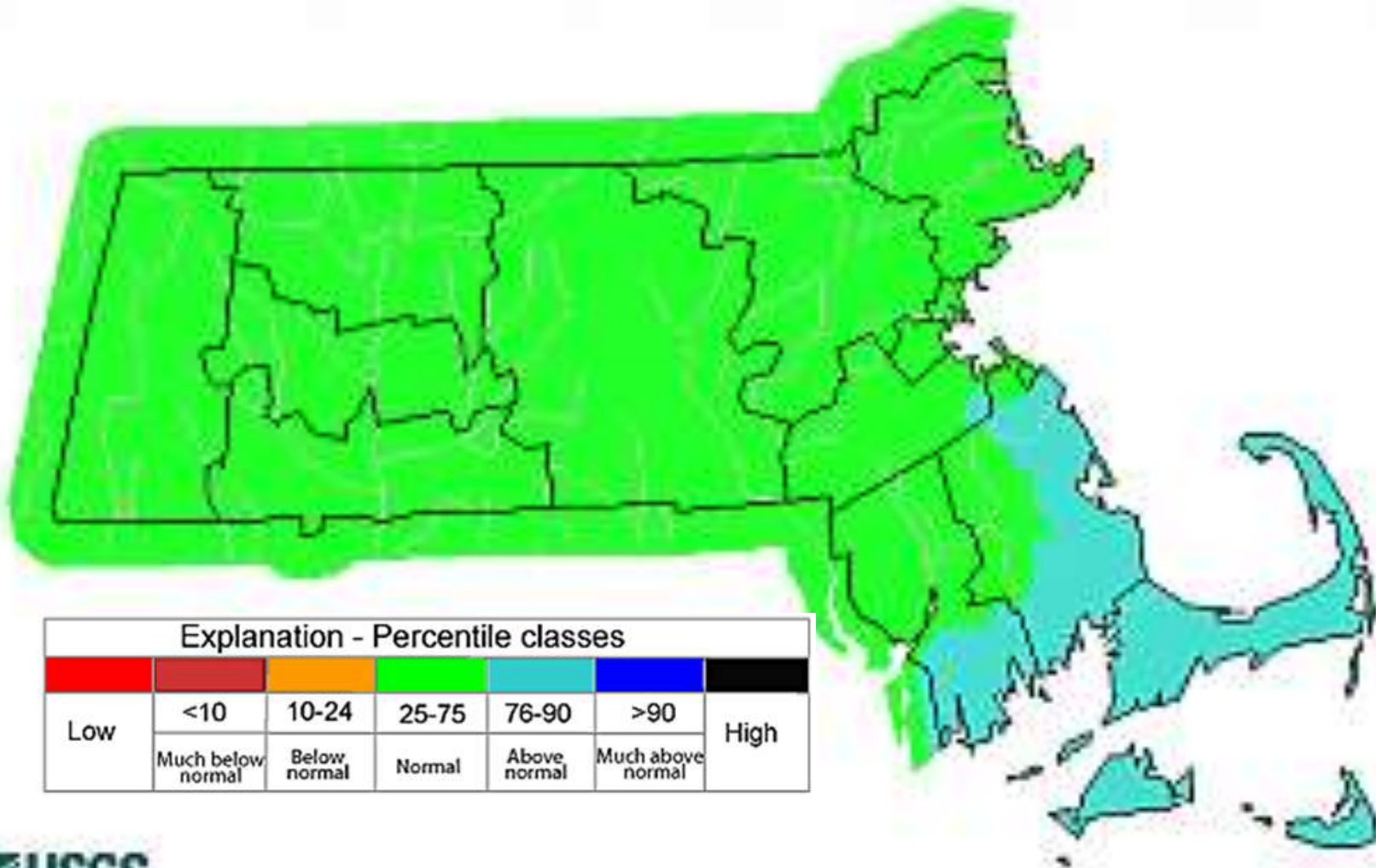
July 8, 2020

Gardner Bent  
U.S. Geological Survey  
New England Water Science Center



# Average Streamflow Conditions – April 2020

April 2020

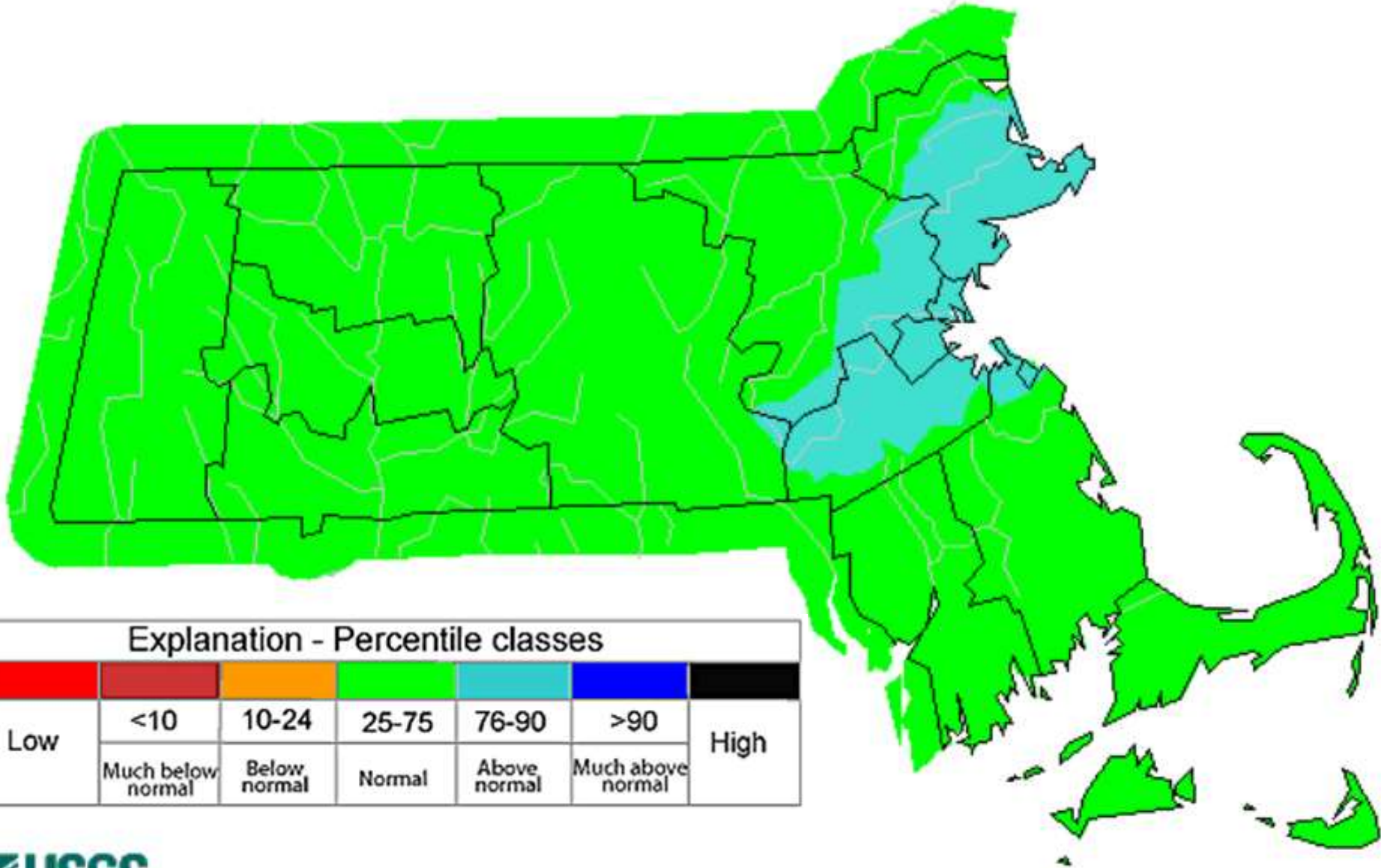


Explanation - Percentile classes

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

# Average Streamflow Conditions – May 2020

May 2020

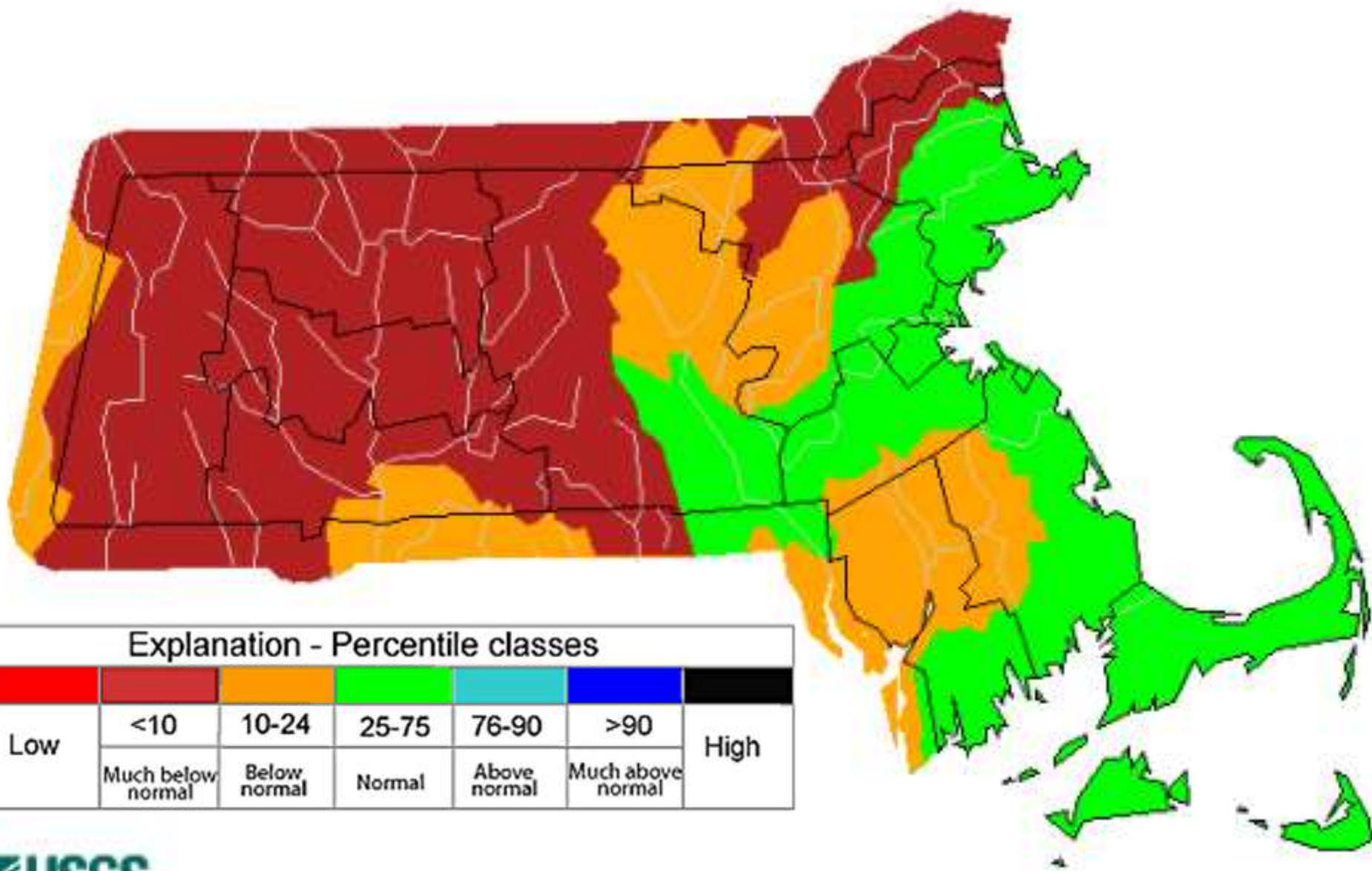


Explanation - Percentile classes

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

# Average Streamflow Conditions – June 2020

June 2020

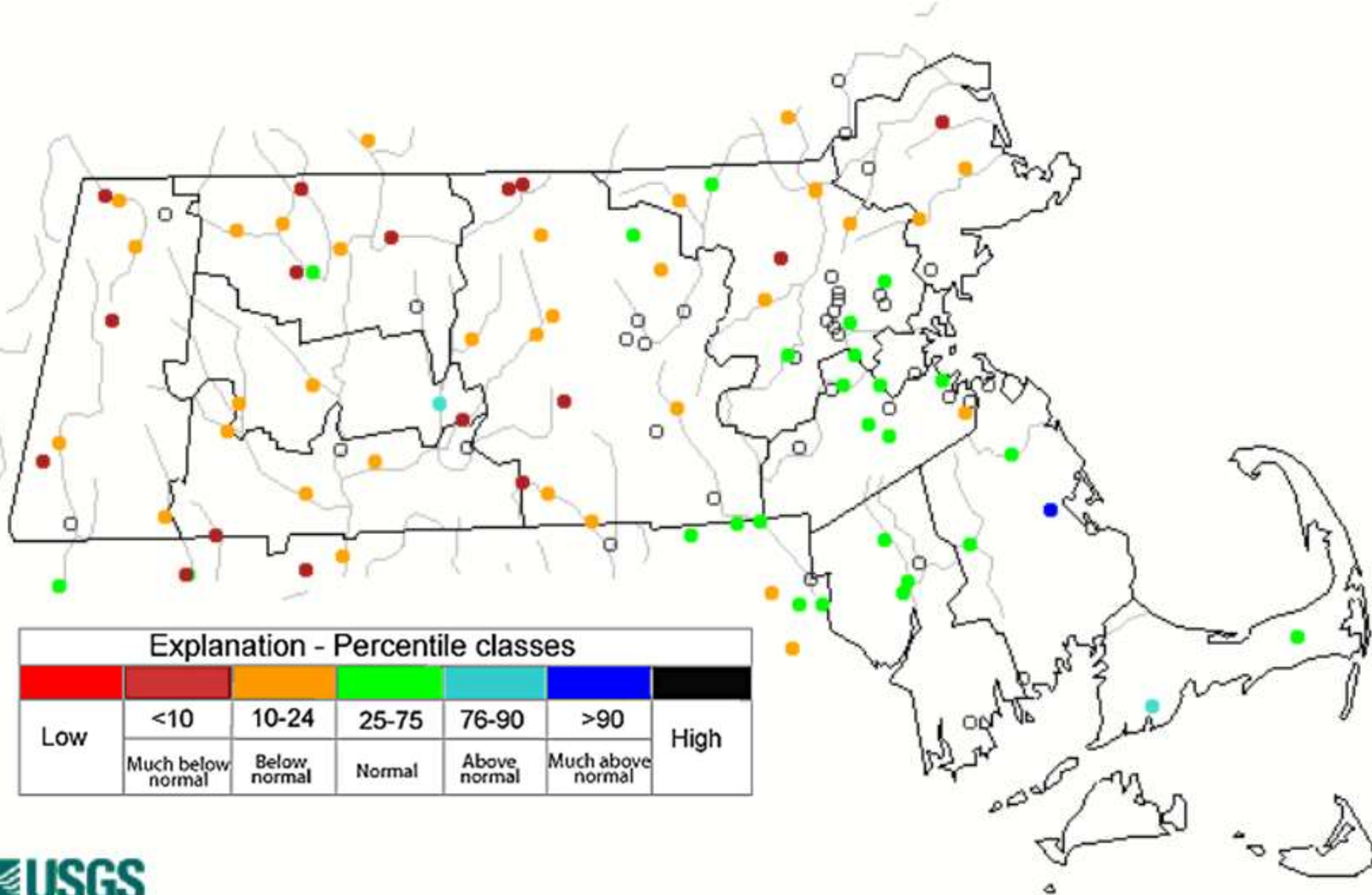


Explanation - Percentile classes

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

# Streamflow Conditions – June 14, 2020

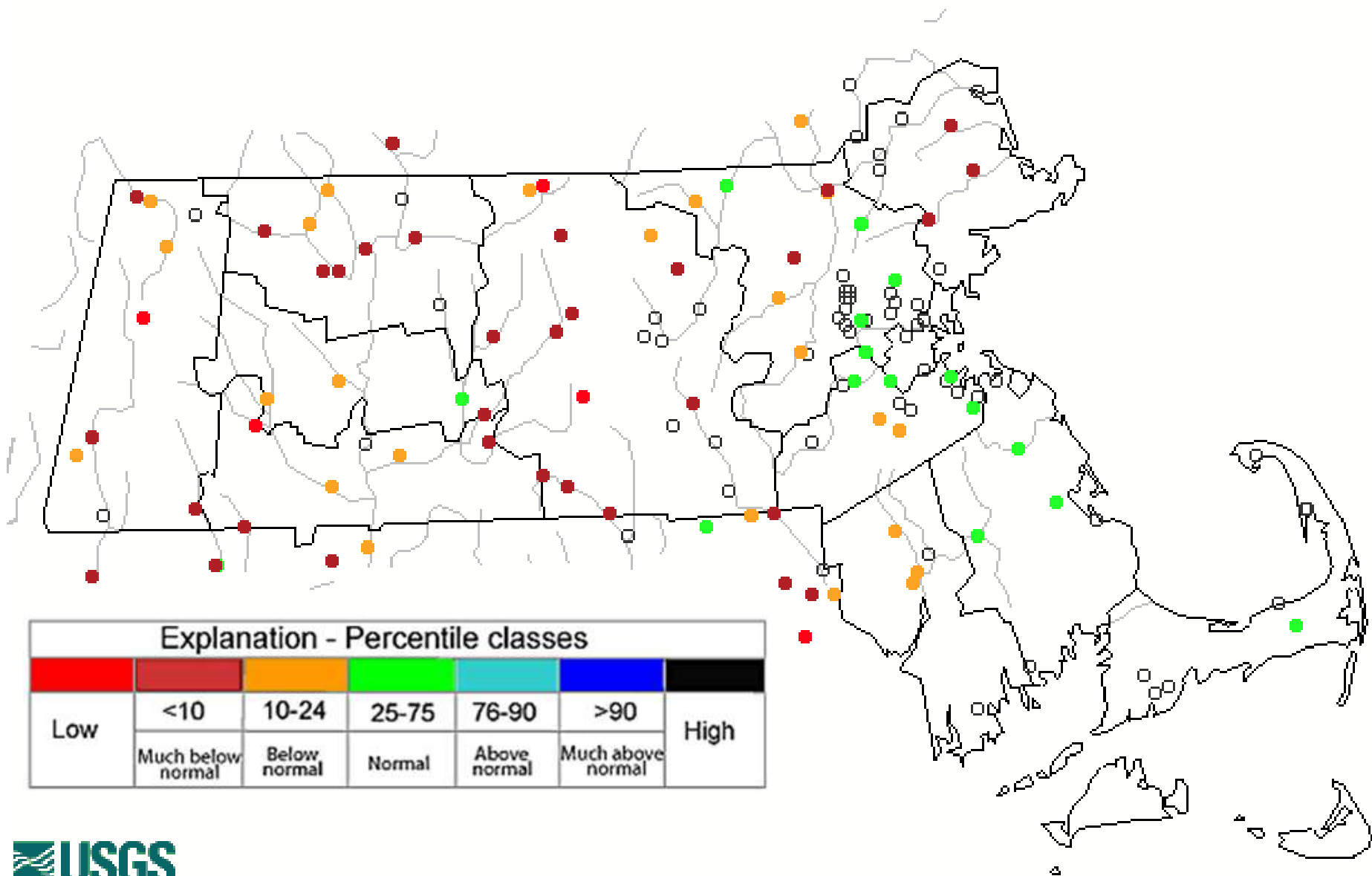
Sunday, June 14, 2020



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

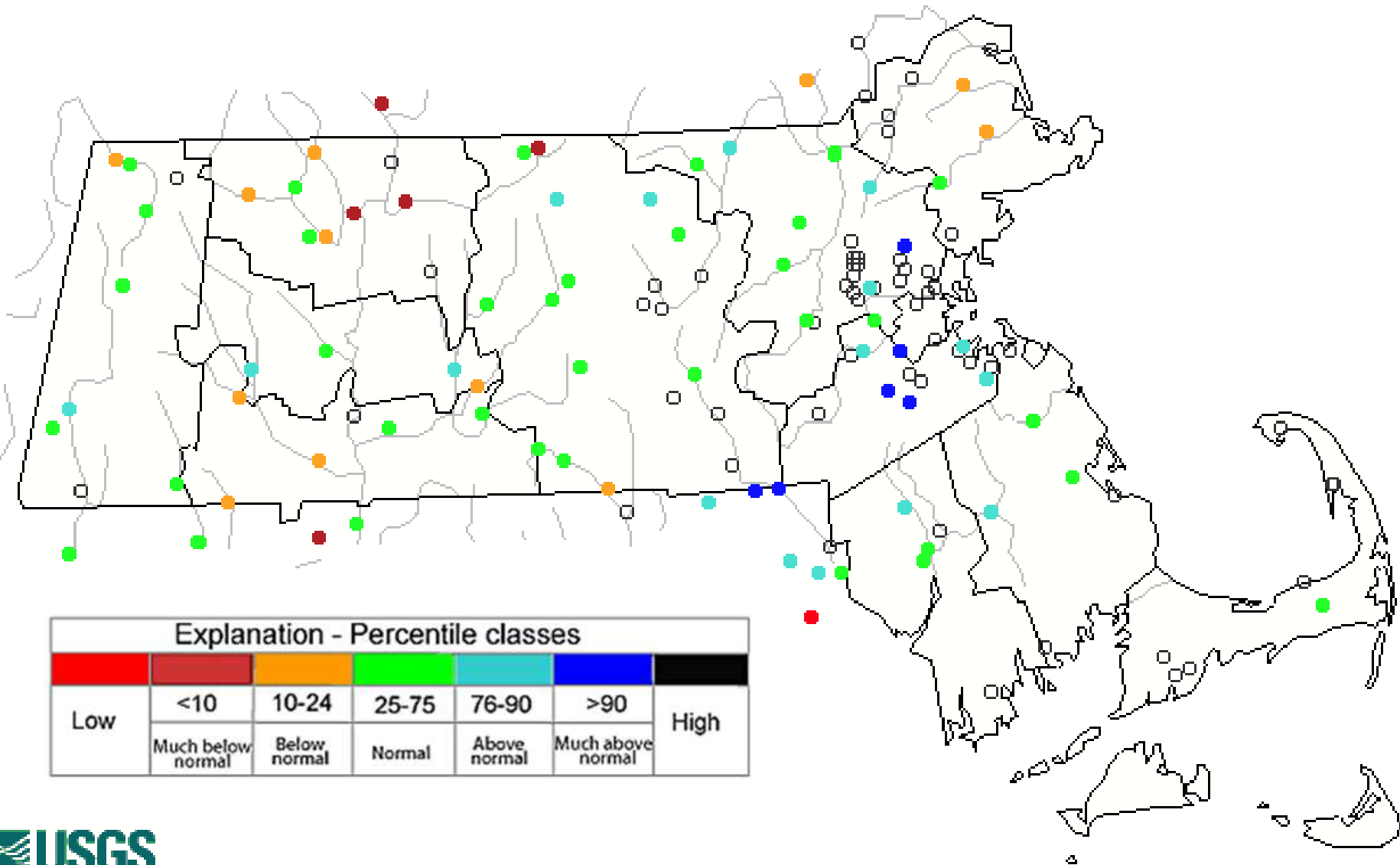
# Streamflow Conditions – June 23, 2020

Tuesday, June 23, 2020 06:30ET



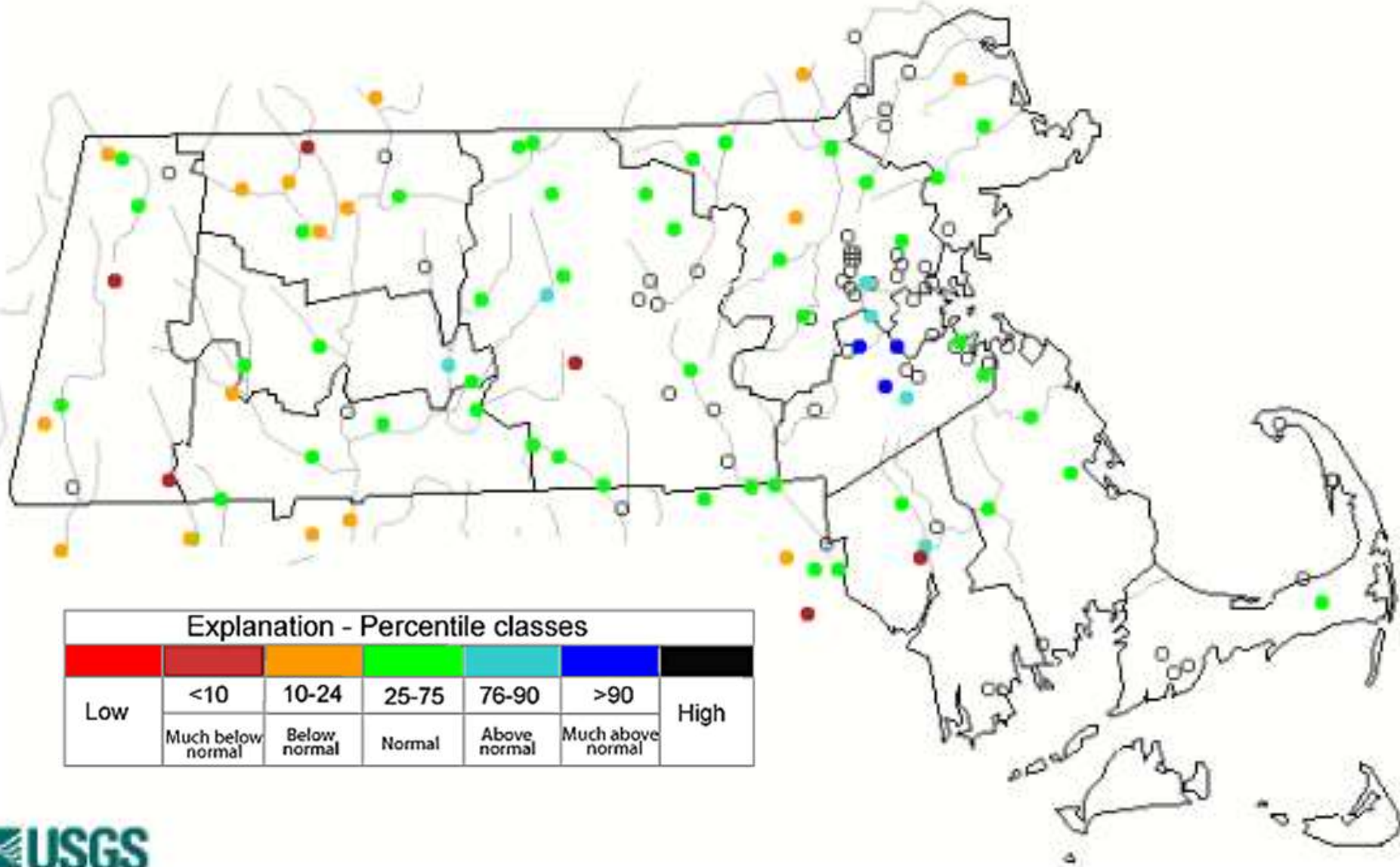
# Streamflow Conditions – June 30, 2020

Tuesday, June 30, 2020 05:30ET



# Current Streamflow Conditions – July 7, 2020

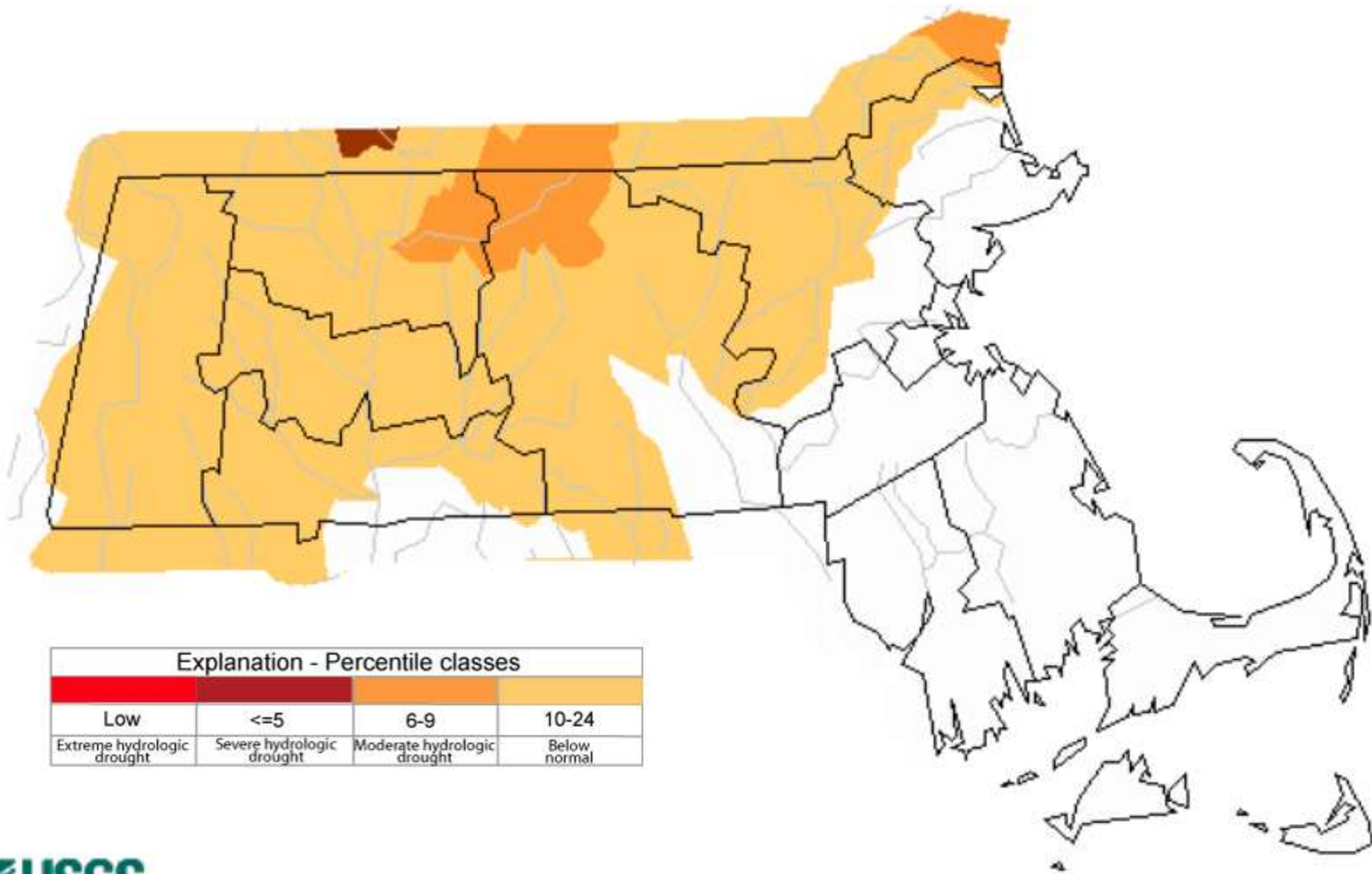
Tuesday, July 07, 2020 15:30ET





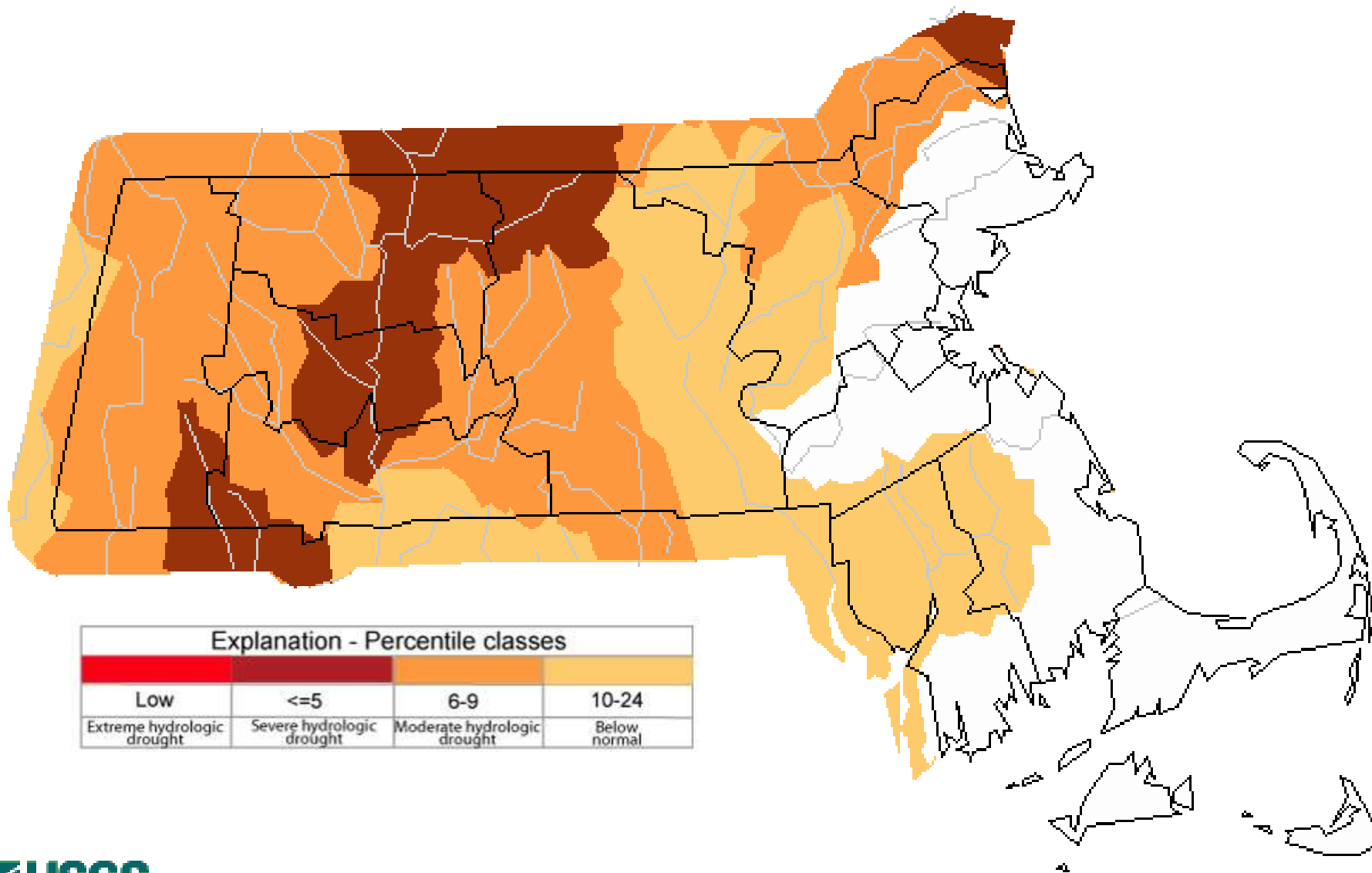
# Below normal 7-day average streamflow – June 14, 2020

Sunday, June 14, 2020



# Below normal 7-day average streamflow – June 21, 2020

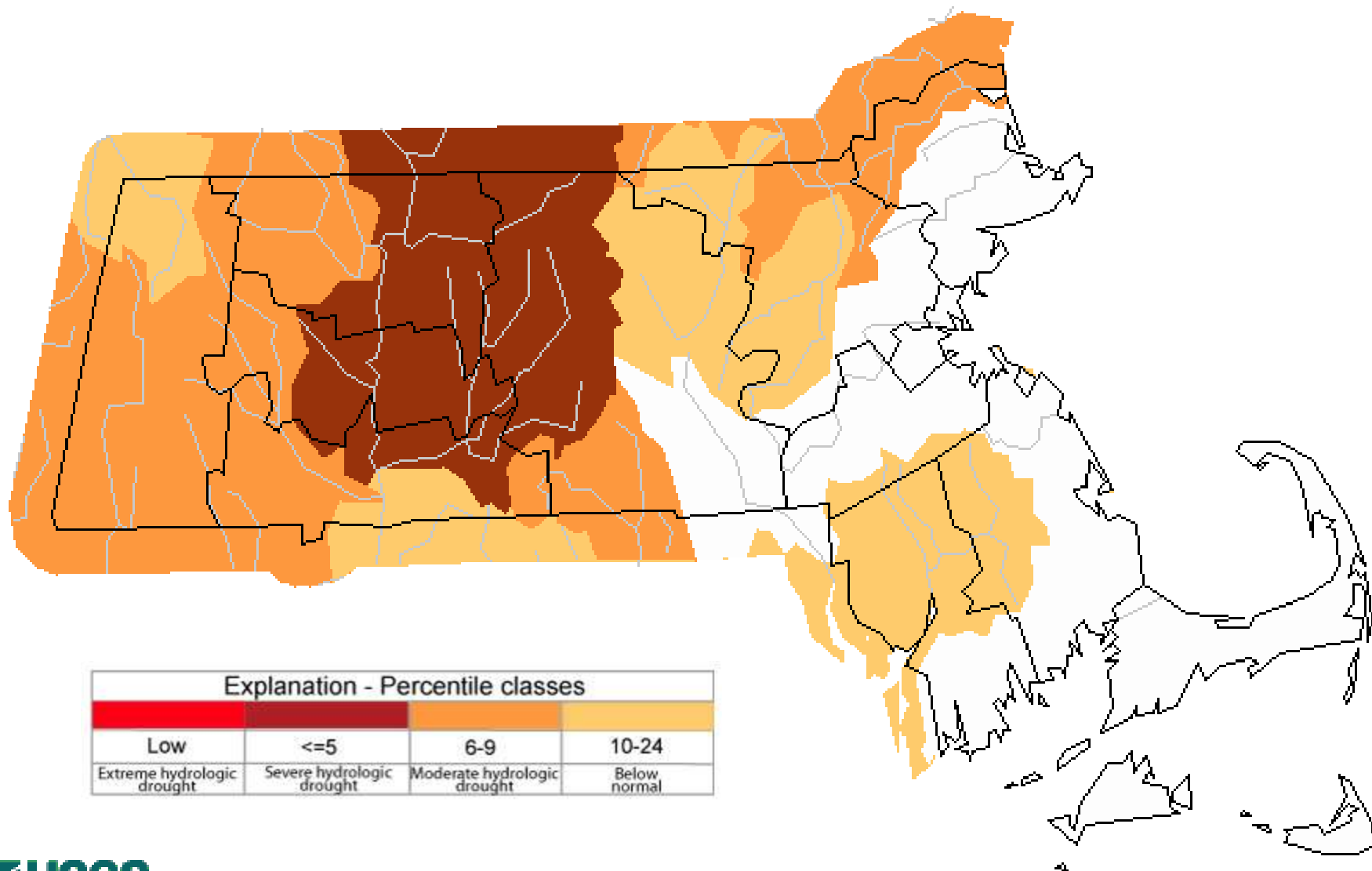
Sunday, June 21, 2020



Explanation - Percentile classes			
Low	<=5	6-9	10-24
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal

# Below normal 7-day average streamflow – June 28, 2020

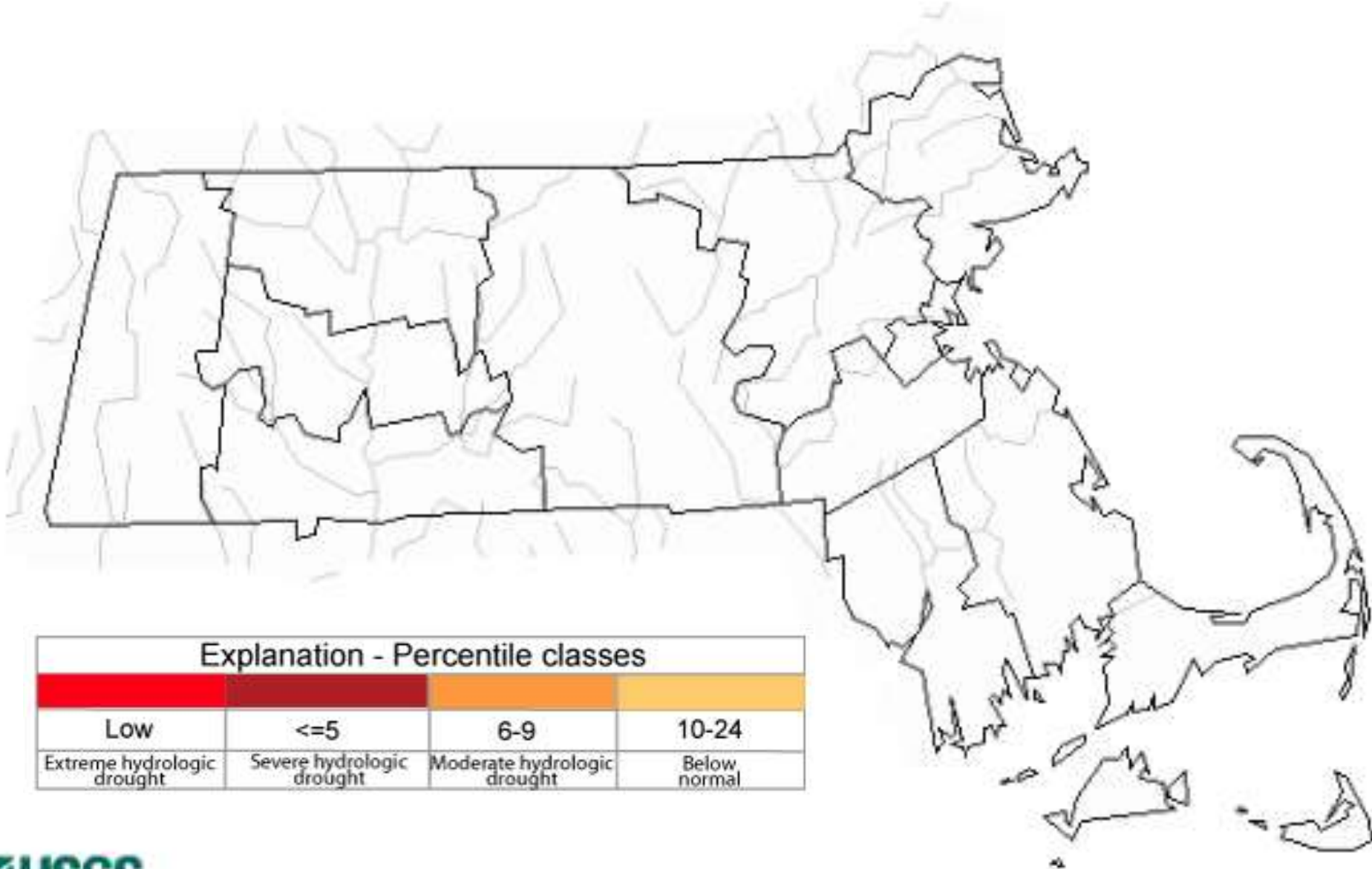
Sunday, June 28, 2020



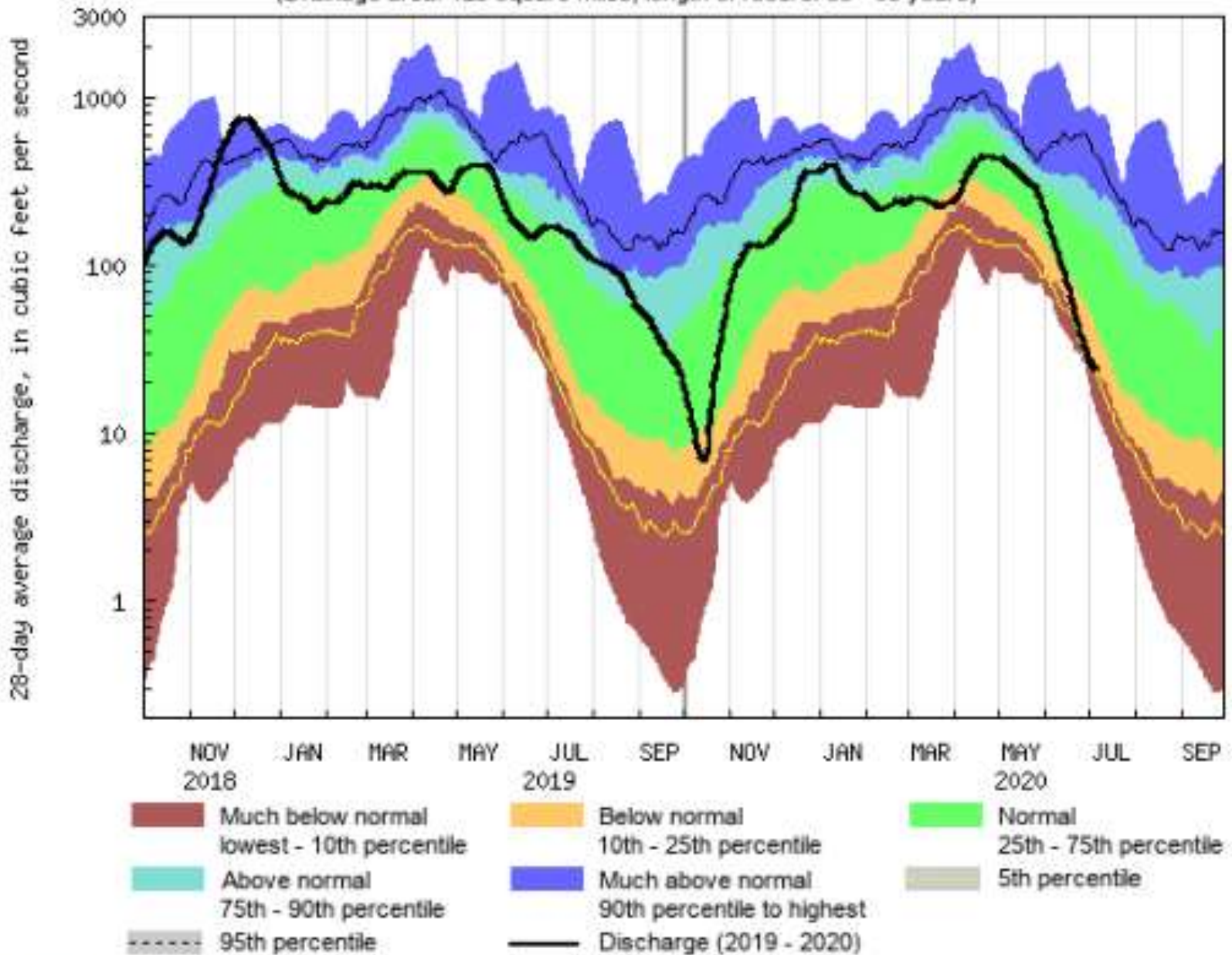
Explanation - Percentile classes			
Low	<=5	6-9	10-24
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal

# Below normal 7-day average streamflow – July 7, 2020

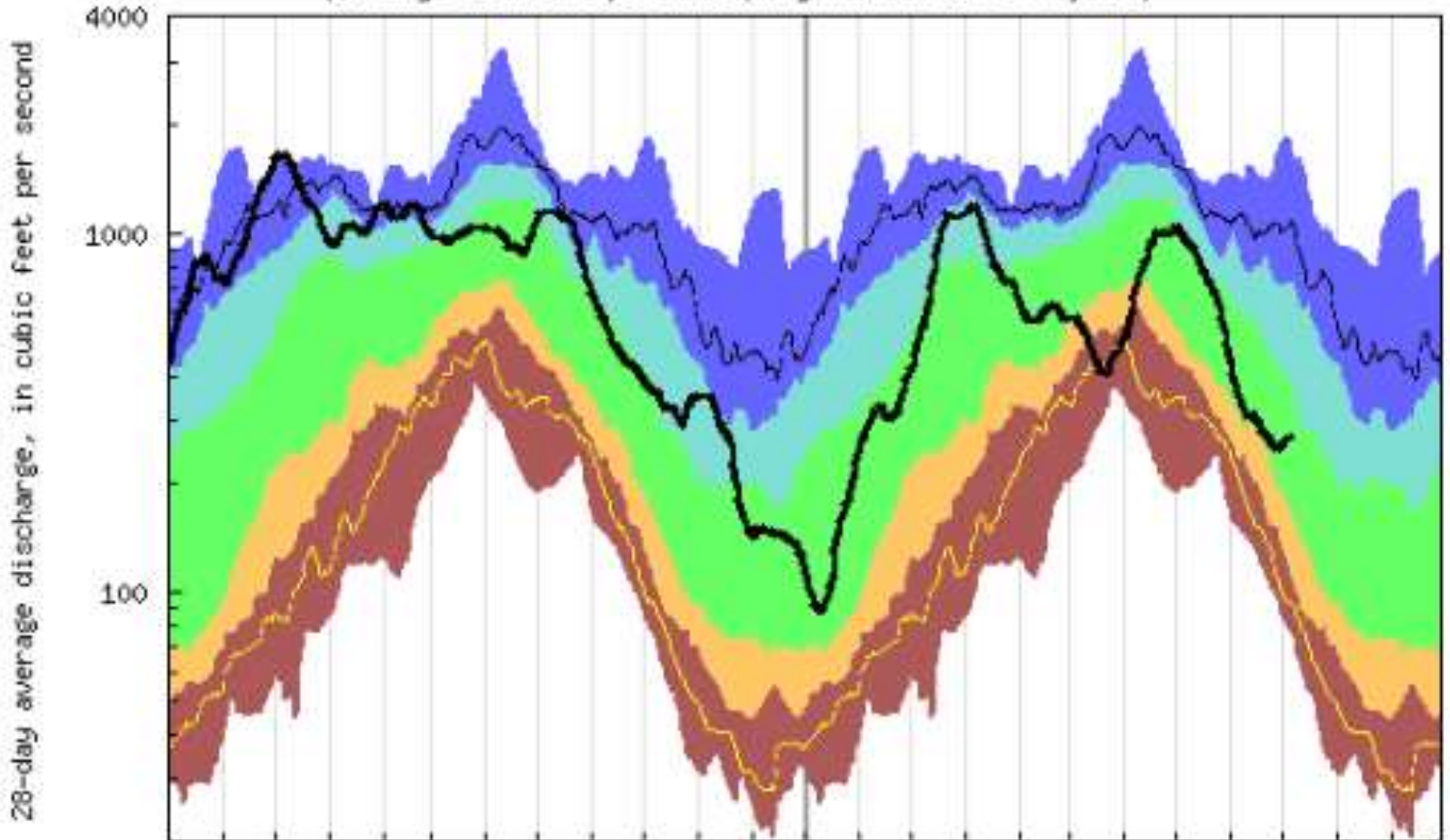
Monday, July 06, 2020



USGS 01102000 IPSWICH RIVER NEAR IPSWICH, MA  
 (Drainage area: 125 square miles, length of record: 89 - 90 years)

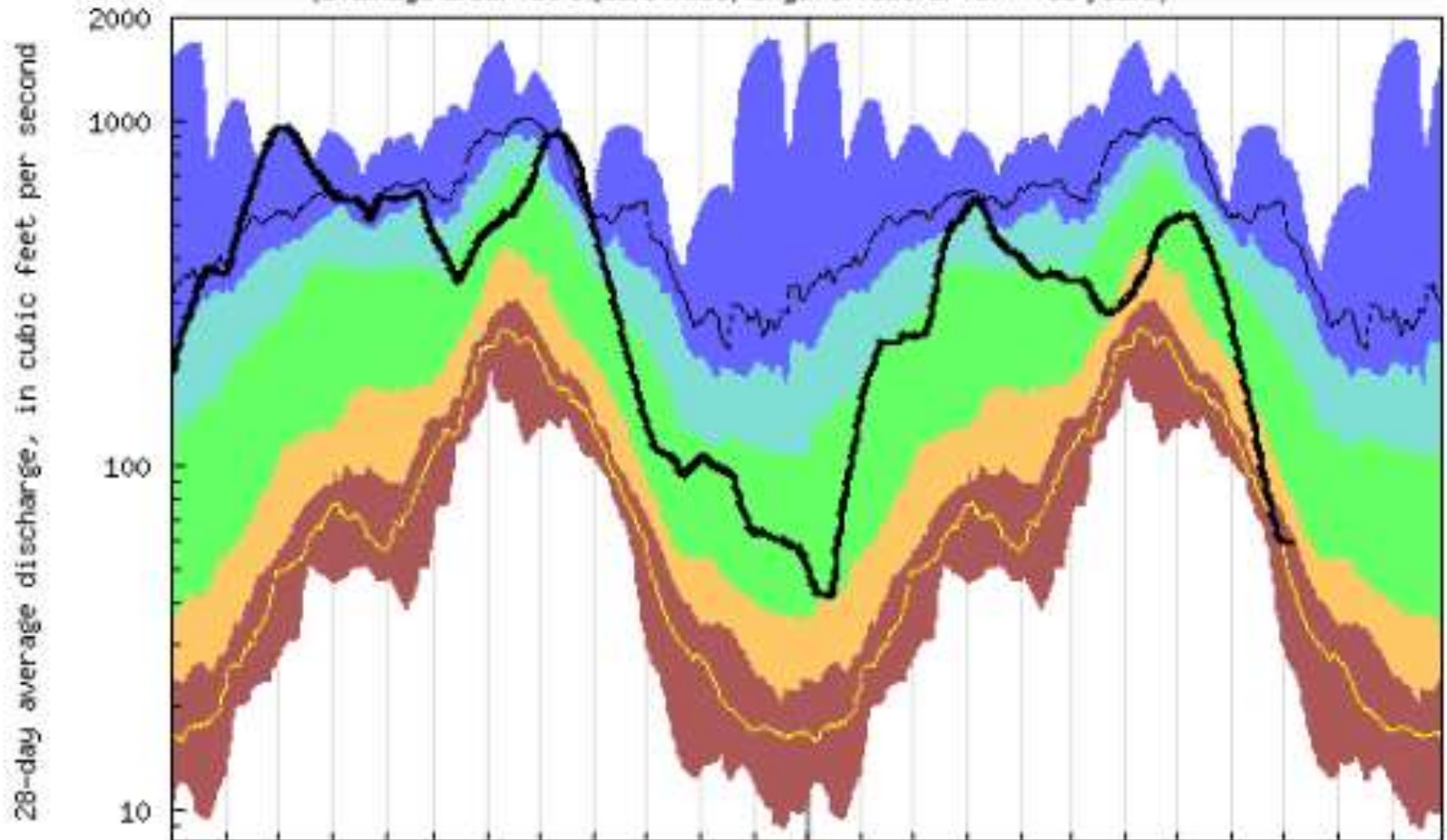


USGS 01108000 TAUNTON RIVER NEAR BRIDGEWATER, MA  
 (Drainage area: 261 square miles, length of record: 72 - 74 years)

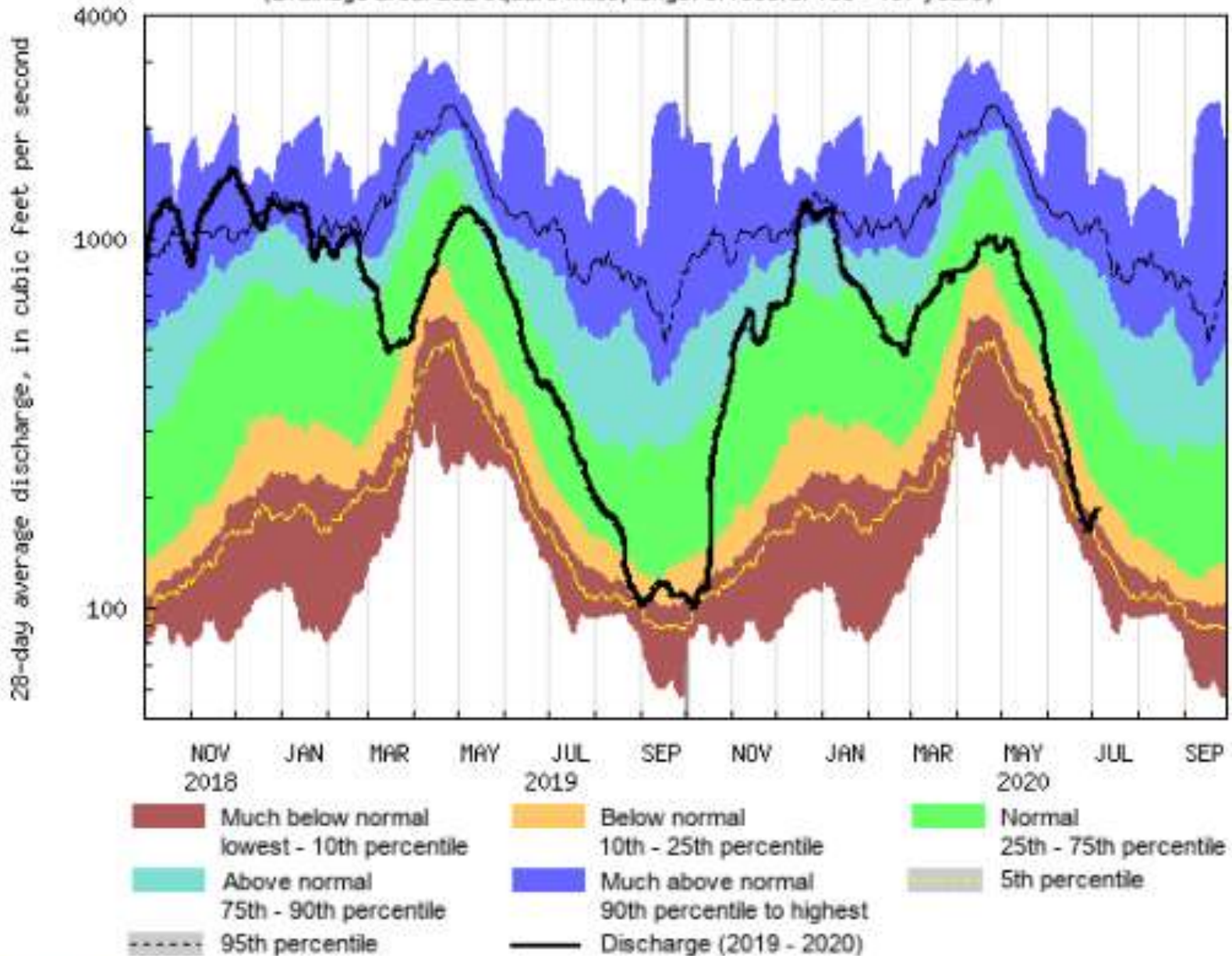


- |   |  |                                  |  |   |                |                 |                         |          |          |          |          |
|---|--|----------------------------------|--|---|----------------|-----------------|-------------------------|----------|----------|----------|----------|
| NOV 2018                                      | JAN 2019                               | MAR 2019                         | MAY 2019                               | JUL 2019  | SEP 2019       | NOV 2019        | JAN 2020                | MAR 2020 | MAY 2020 | JUL 2020 | SEP 2020 |
| Much below normal<br>lowest - 10th percentile | Below normal<br>10th - 25th percentile | Normal<br>25th - 75th percentile | Above normal<br>75th - 90th percentile | Much above normal<br>90th percentile to highest | 5th percentile | 95th percentile | Discharge (2019 - 2020) |          |          |          |          |

USGS 01176000 QUABOAG RIVER AT WEST BRIMFIELD, MA  
 (Drainage area: 150 square miles, length of record: 107 - 108 years)

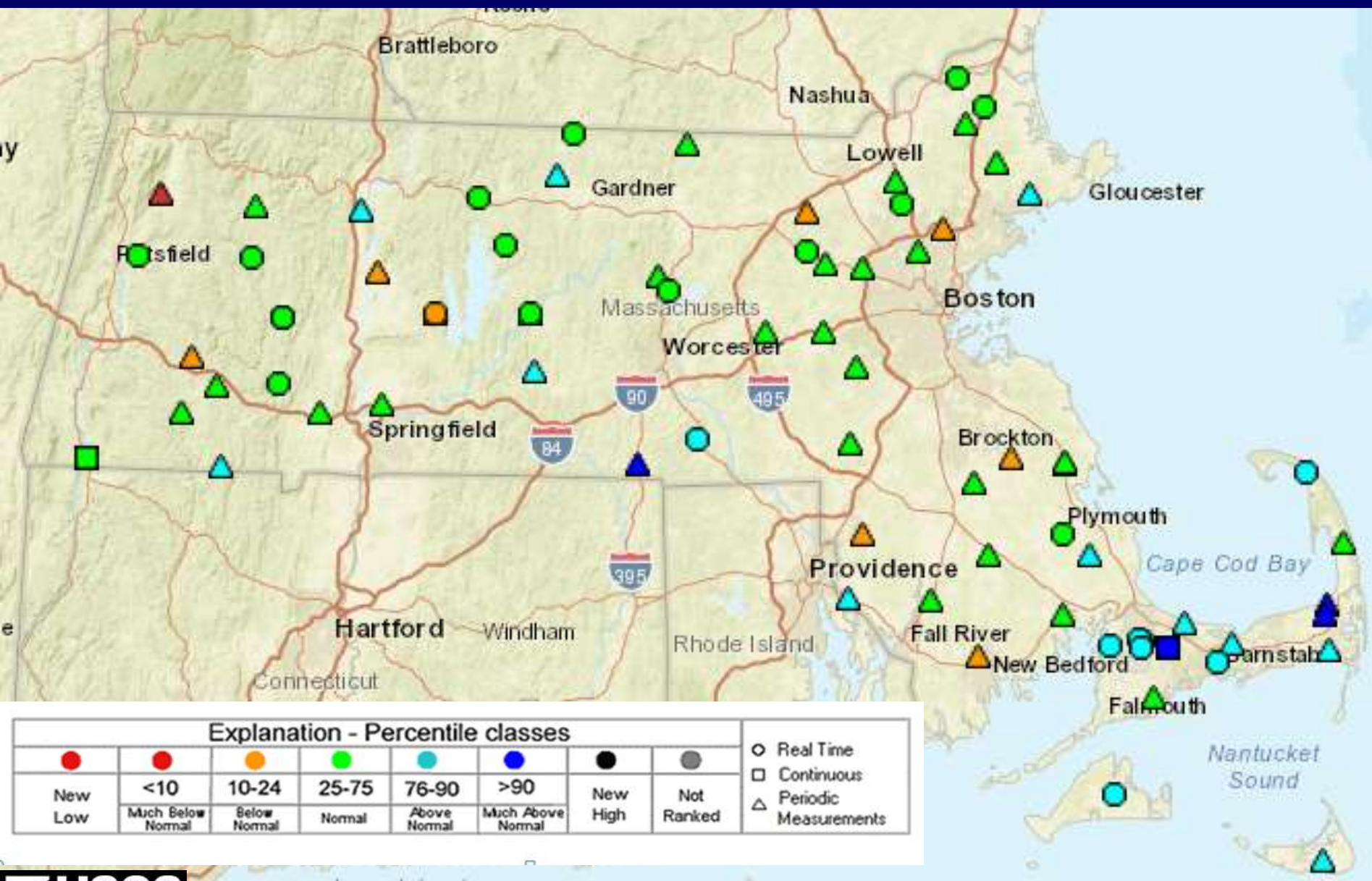


USGS 01197500 HOUSATONIC RIVER NEAR GREAT BARRINGTON, MA  
 (Drainage area: 282 square miles, length of record: 106 - 107 years)

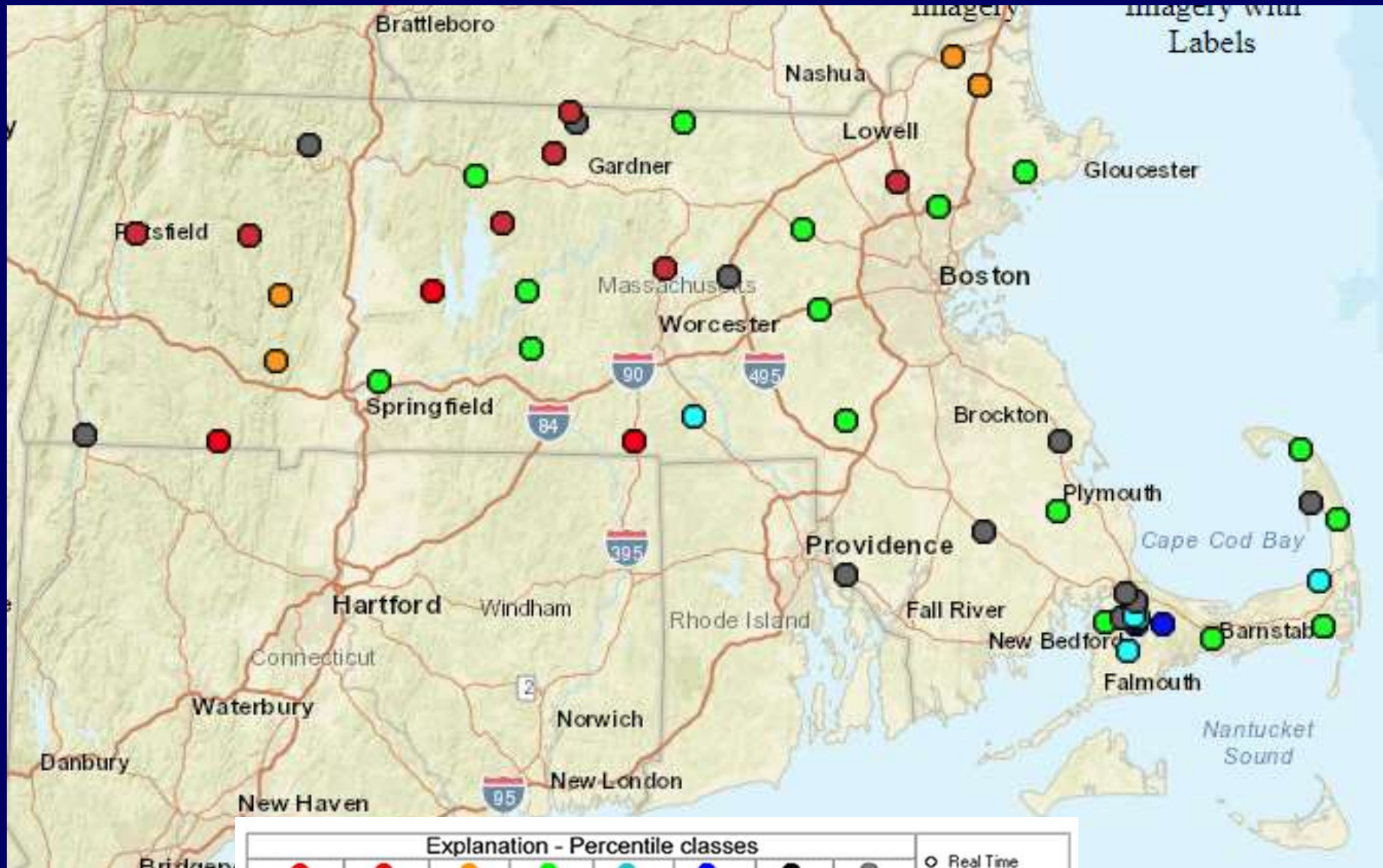




# GW Conditions Late June – Early July, 2020



# Real-time GW Conditions – June 30, 2020

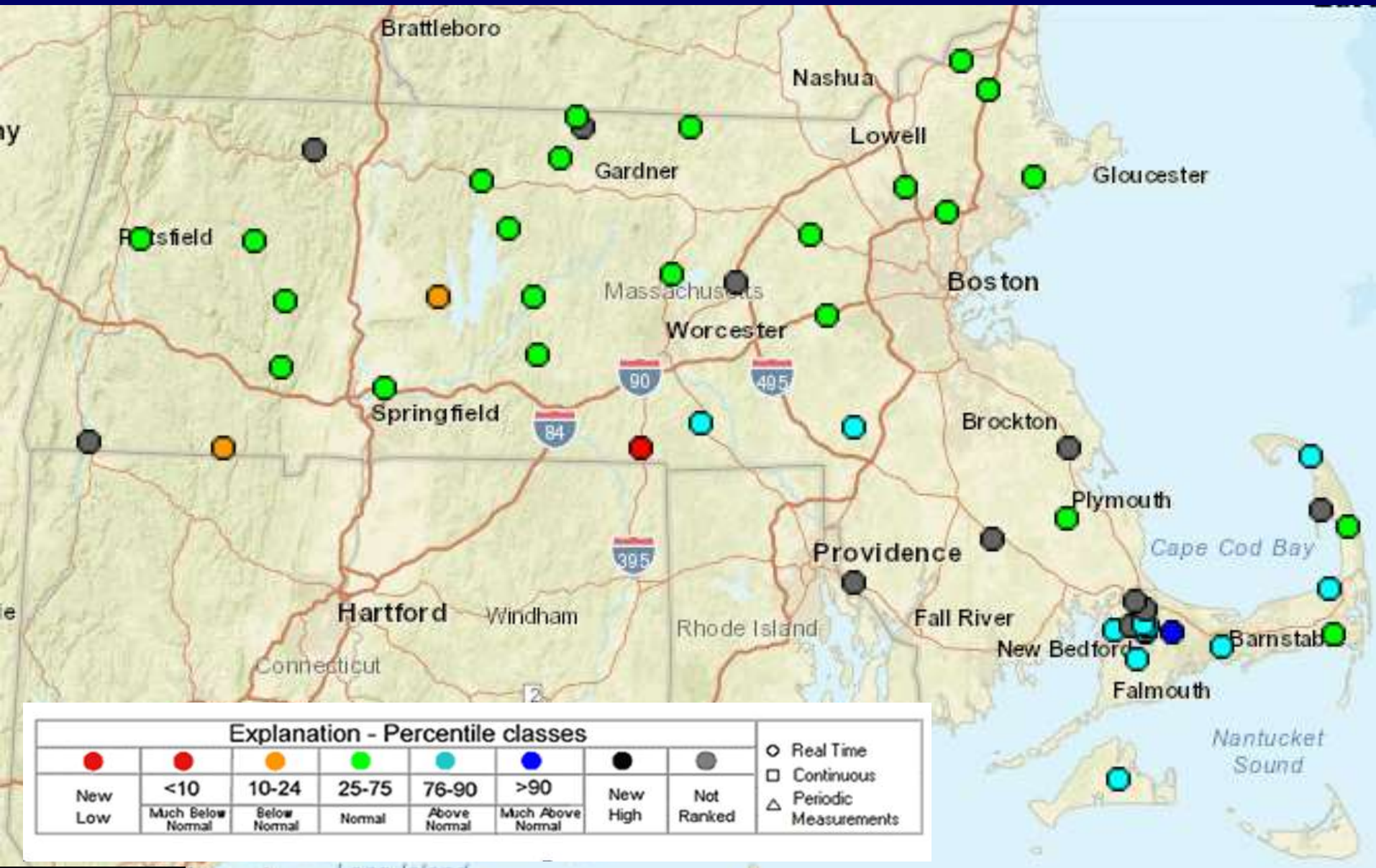


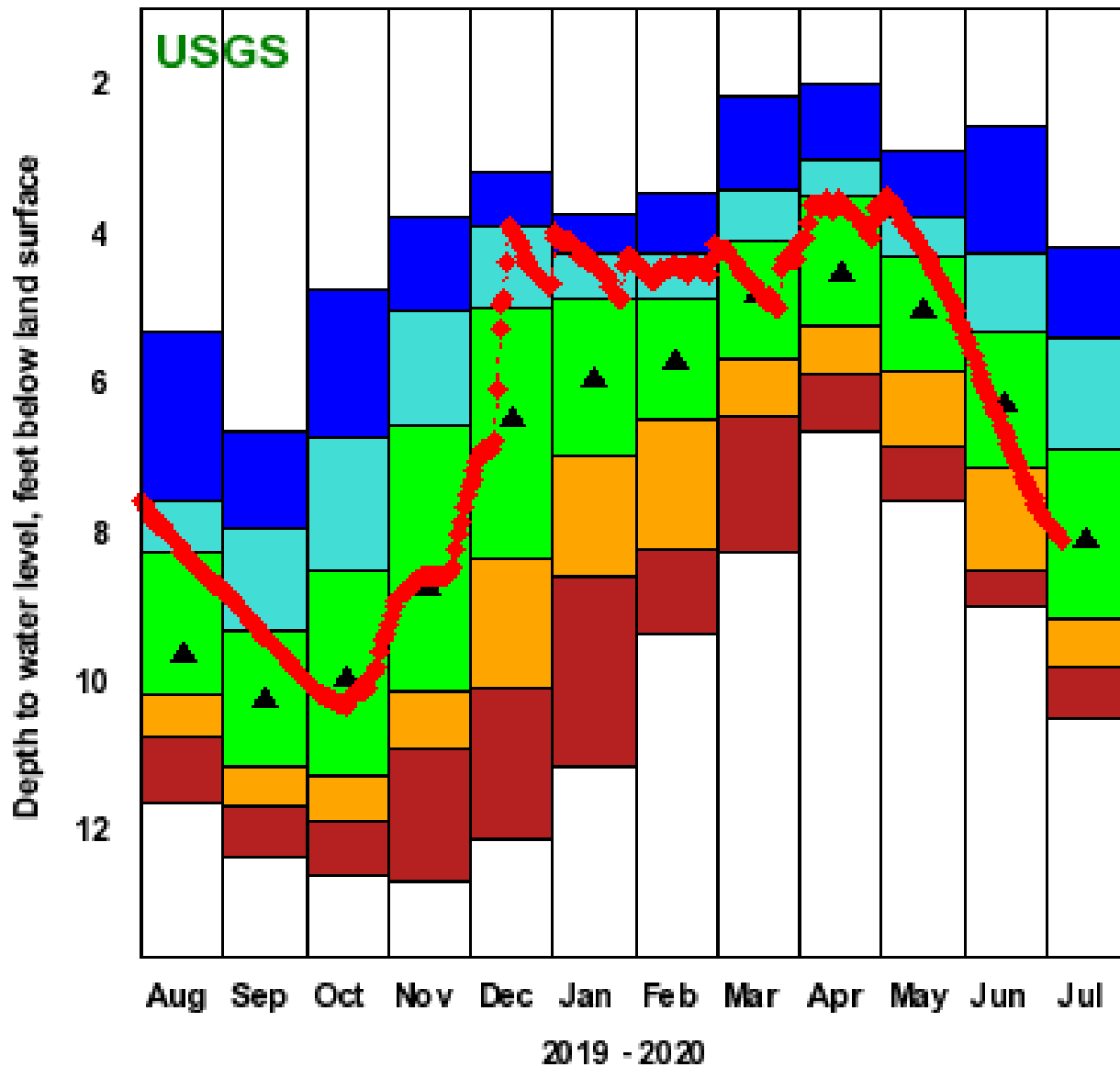
Explanation - Percentile classes							
New Low	<10	10-24	25-75	76-90	>90	New High	Not Ranked
	Much Below Normal	Below Normal	Normal	Above Normal	Much Above Normal		

	Real Time
	Continuous
	Periodic Measurements

# Real-time GW Conditions – July 7, 2020





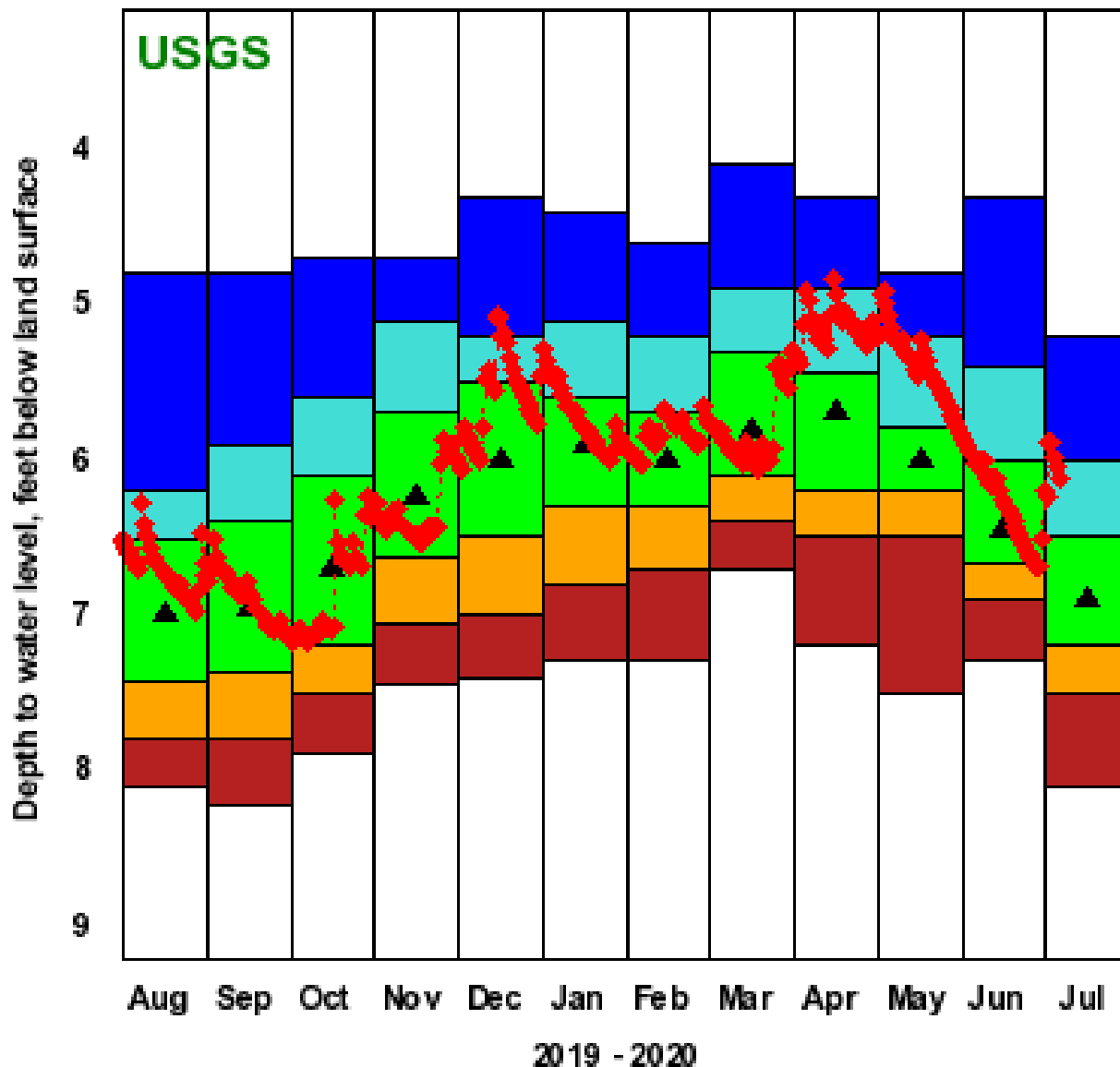
Plot created 07/06/20 19:37

Explanation - Percentile Classes

◆ Data Point

● < 10   ● 10 - 24   ● 25 - 75   ● 76 - 90   ● > 90

▲ Monthly Median



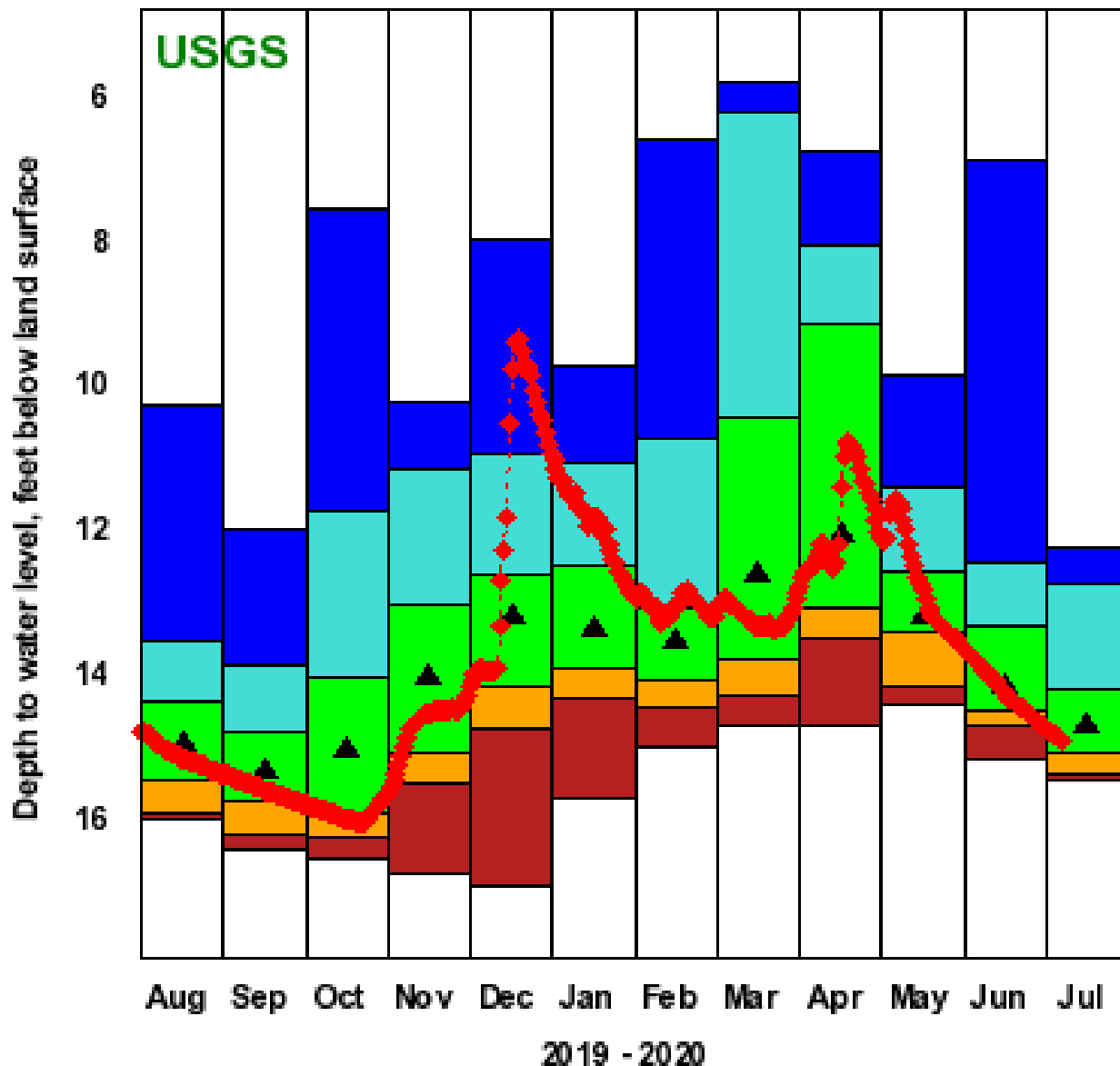
Plot created 07/06/20 19:36

Explanation - Percentile Classes

◆ Data Point

● <10   ● 10-24   ● 25-75   ● 76-90   ● >90

▲ Monthly Median



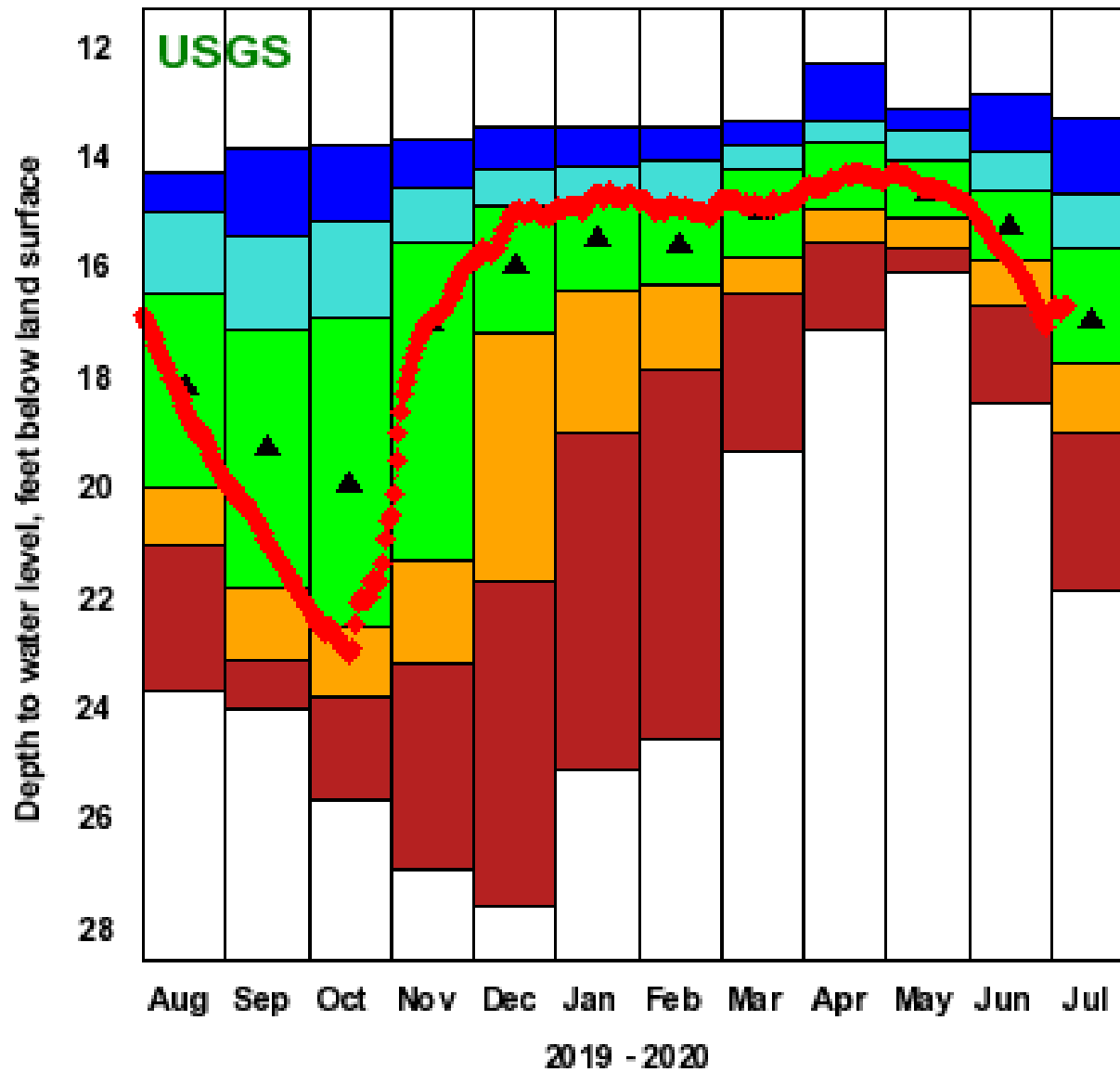
Plot created 07/06/20 19:37

Explanation - Percentile Classes

◆ Data Point

● <10   ● 10-24   ● 25-75   ● 76-90   ● >90

▲ Monthly Median

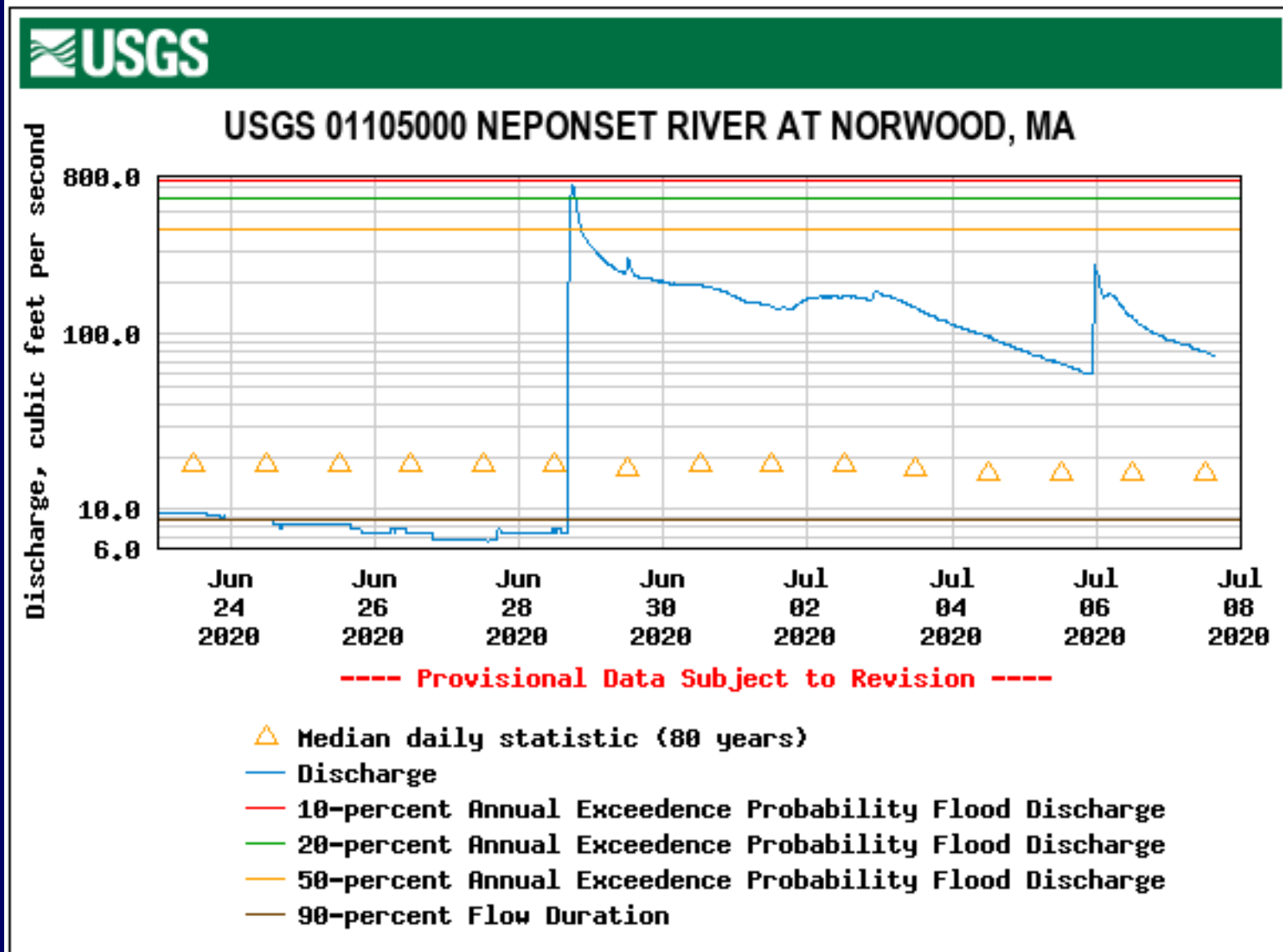


Plot created 07/06/20 19:37

Explanation - Percentile Classes

- ◆ Data Point
- < 10
- 10 - 24
- 25 - 75
- 76 - 90
- > 90
- ▲ Monthly Median

# Questions



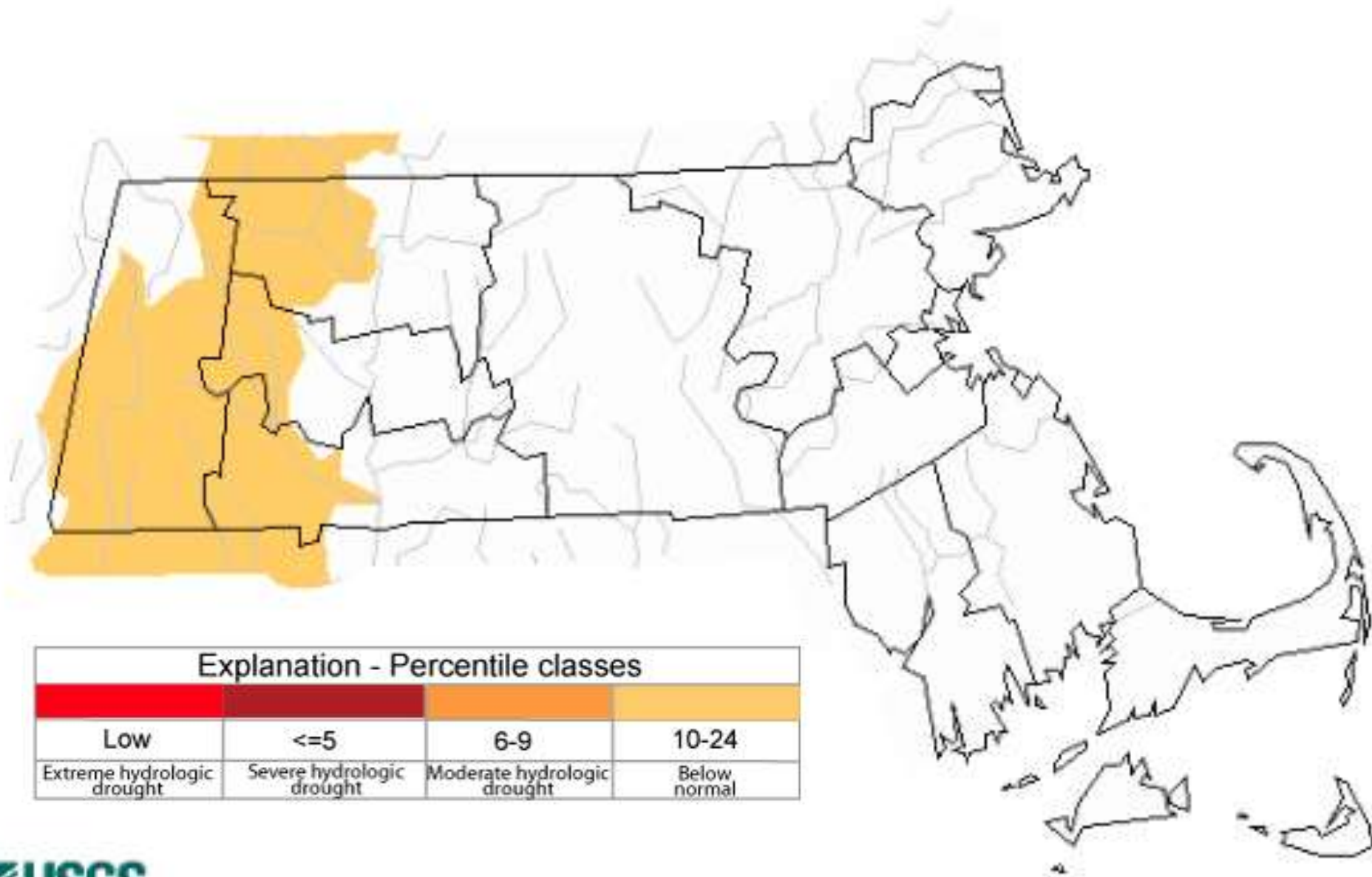


# Extra Slides

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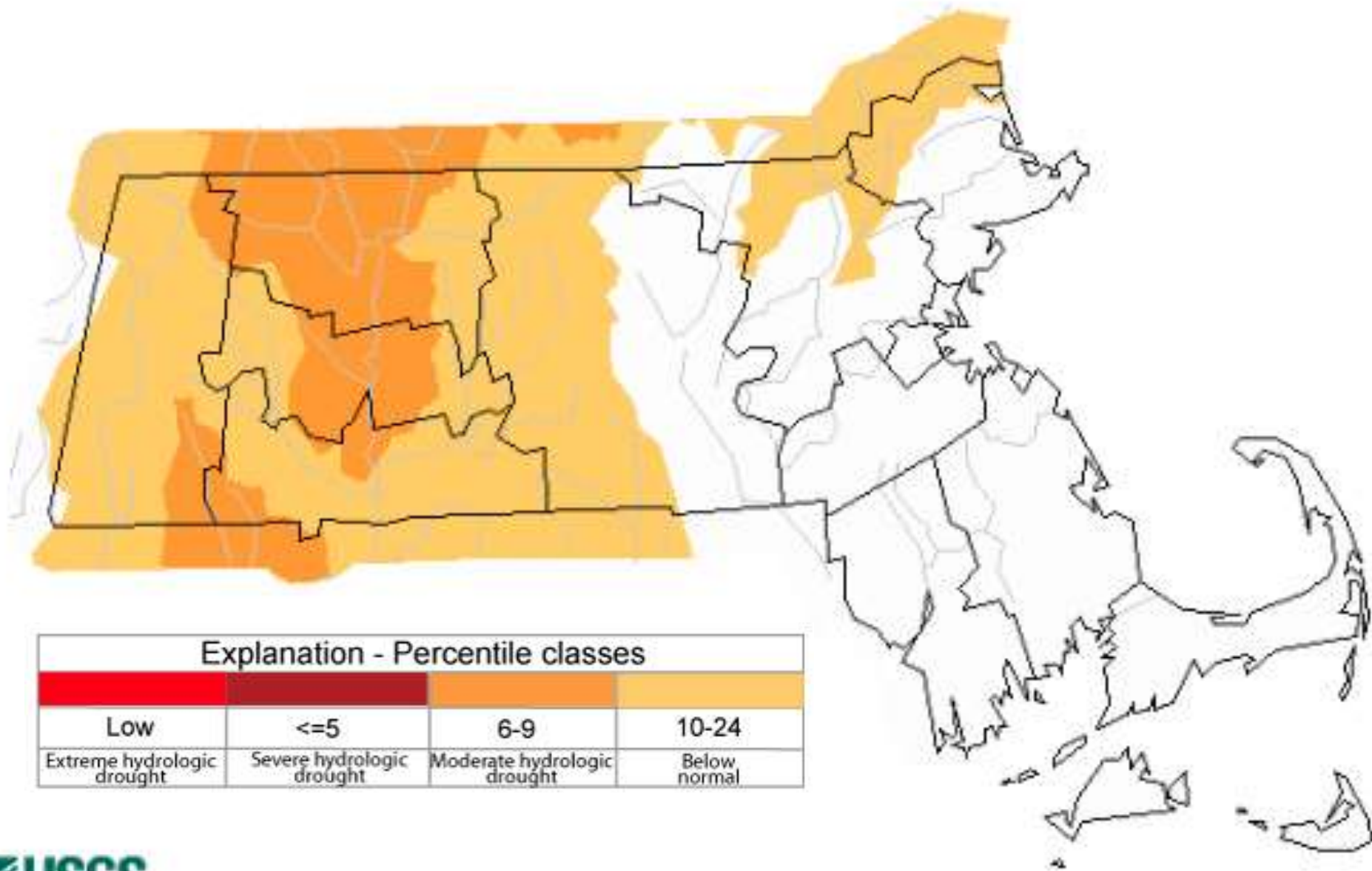
# Below normal 14-day average streamflow – July 7, 2020

Monday, July 06, 2020

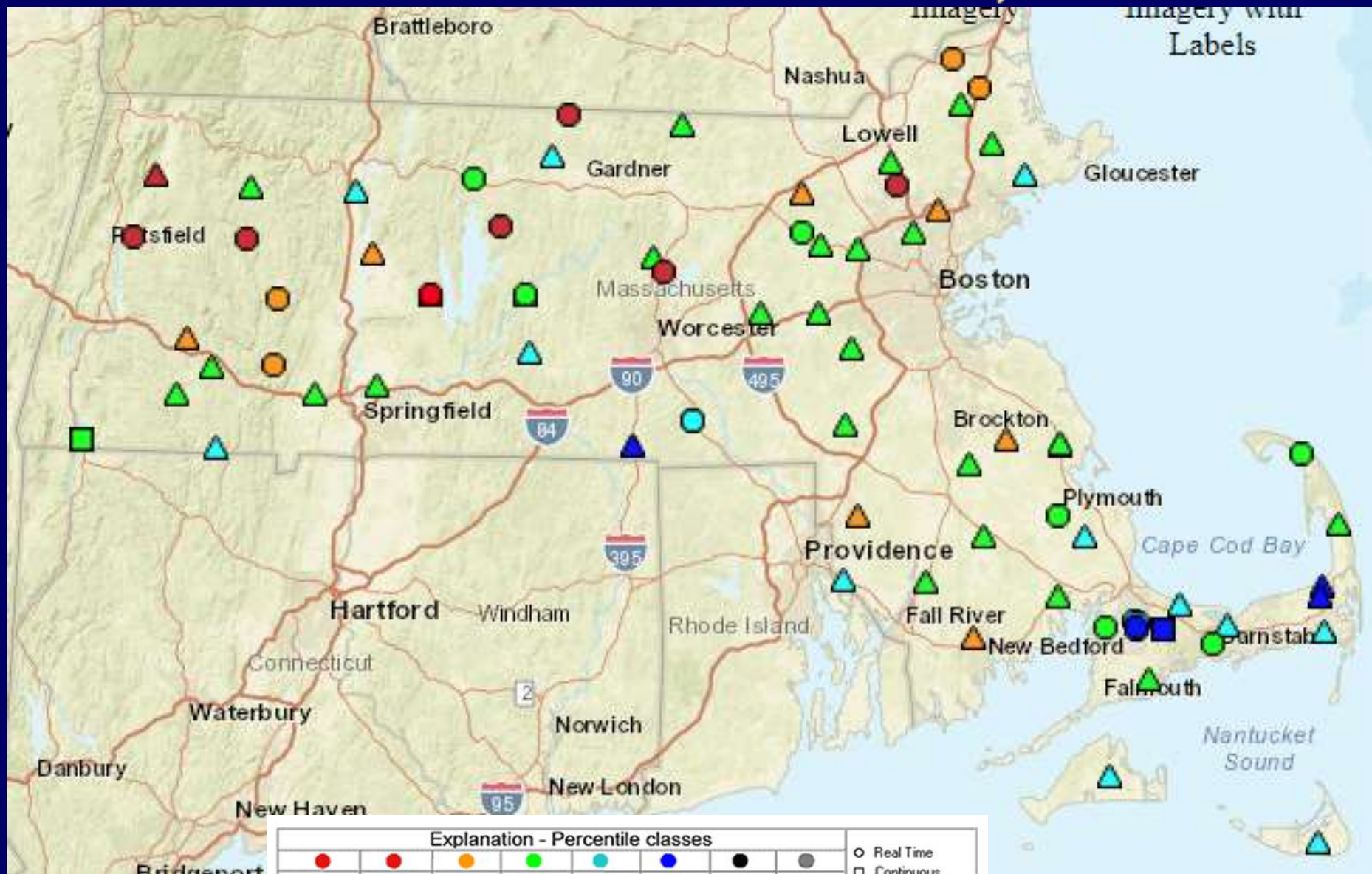


# Below normal 28-day average streamflow – July 7, 2020

Monday, July 06, 2020



# GW Conditions Late June, 2020



Explanation - Percentile classes							
New Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	New High	Not Ranked
							Real Time Continuous Periodic Measurements

# MA Drought Management Task Force NWS Update

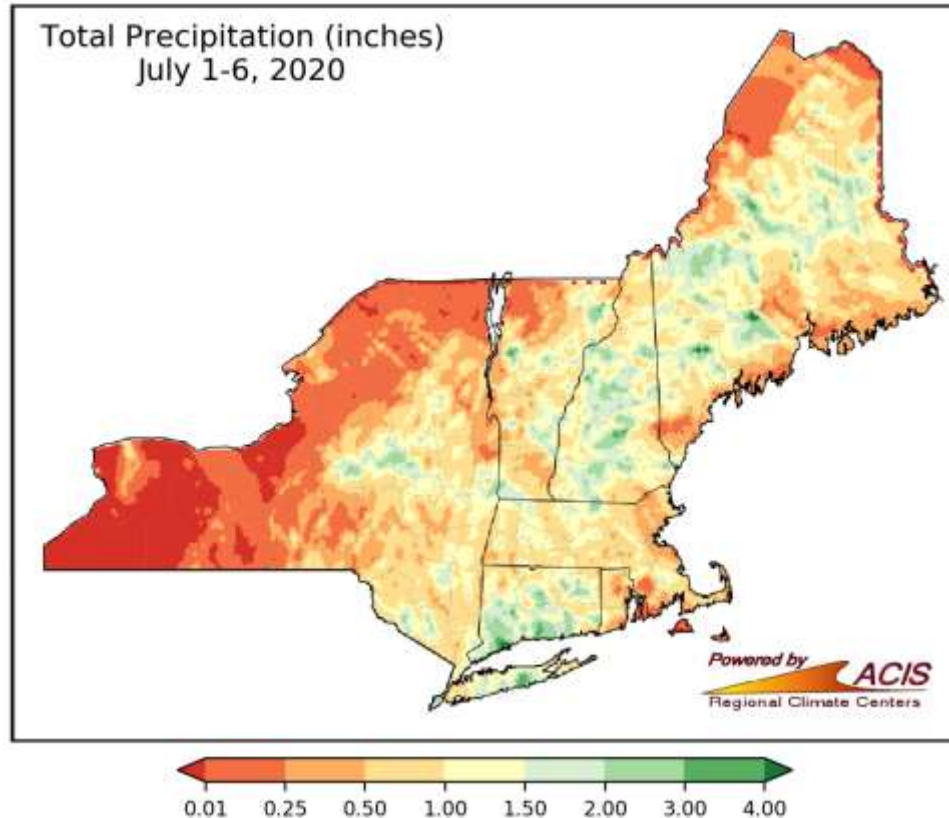
Nicole Belk

National Weather Service Boston/Norton MA

July 8th 2020



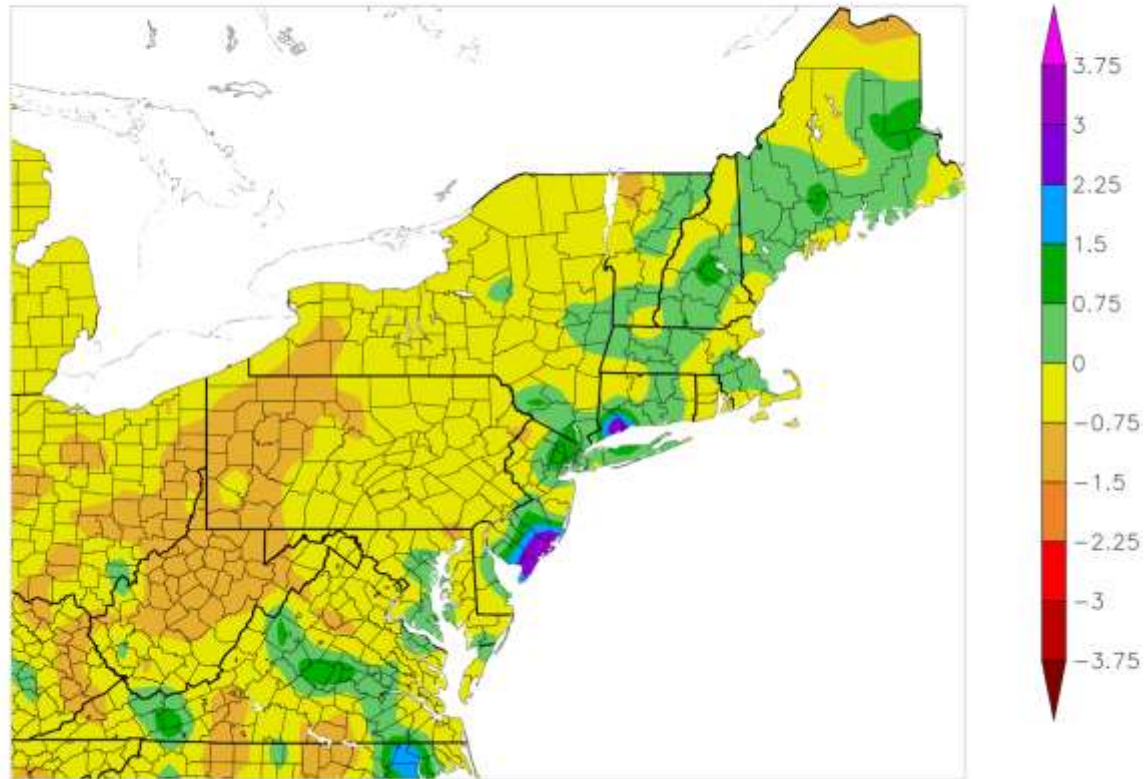
# July 1-6 Month-to-Date Rainfall



# Some July MTD Specifics:

Location			
	0.18	-0.36	0.54
Lawrence	0.47	-0.22	0.69
Middleboro	2.15	+1.47	0.68
Chatham	0.49	+0.02	0.67
Worcester	0.53	-0.20	0.73
Amherst	1.31	+0.49	0.82
Greenfield	0.29	-0.55	0.84
Pittsfield	0.39	-0.29	0.68

# Departure from Normal Precipitation (in) 7/1/2020 – 7/6/2020

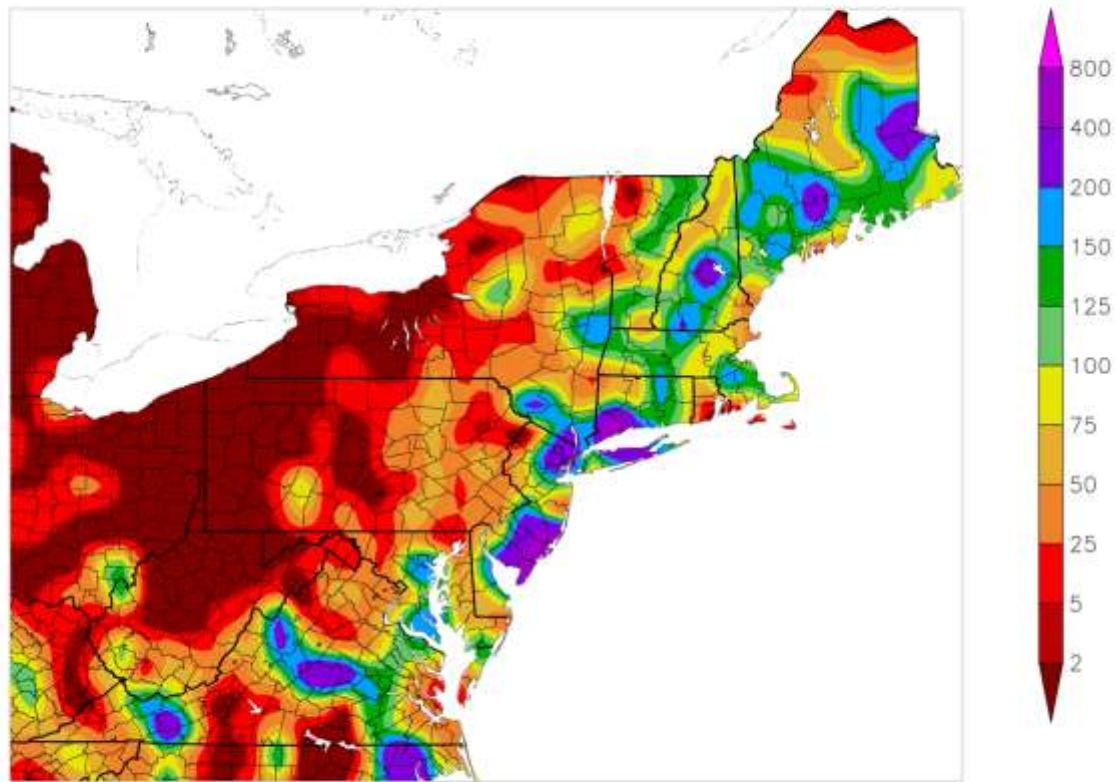


Generated 7/7/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers



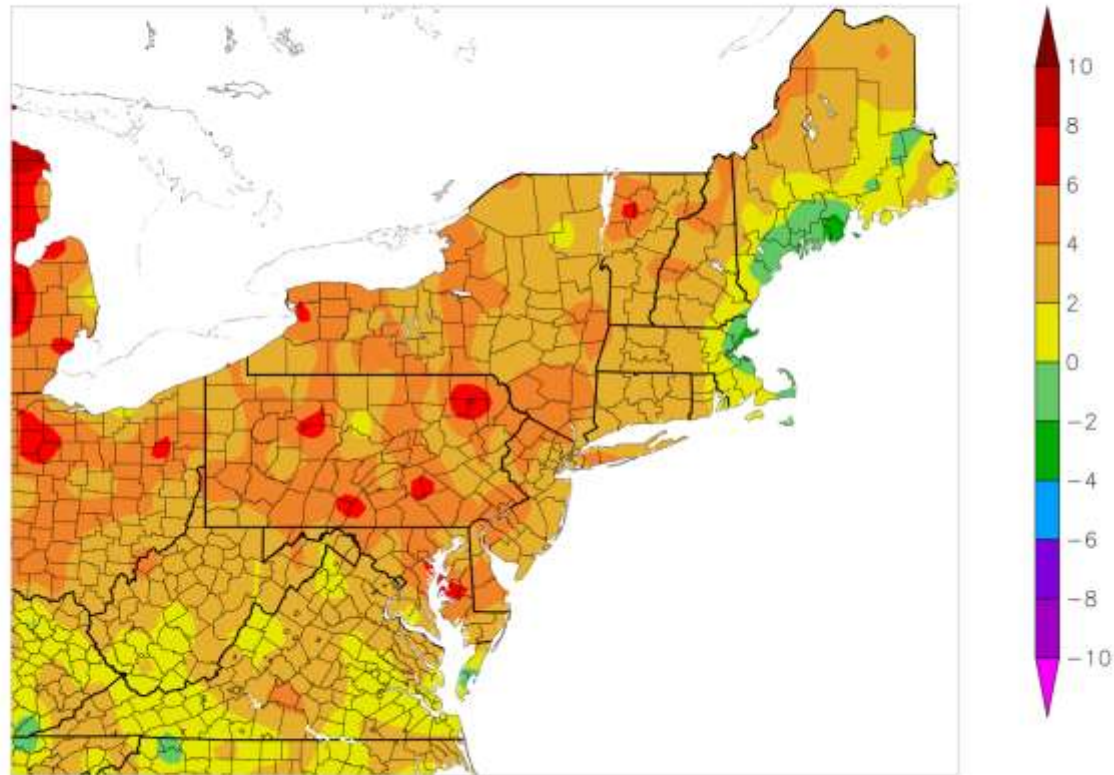
# Percent of Normal Precipitation (%) 7/1/2020 – 7/6/2020



Generated 7/7/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

# Departure from Normal Temperature (F) 7/1/2020 – 7/6/2020



Generated 7/7/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

# Forecast for Boston



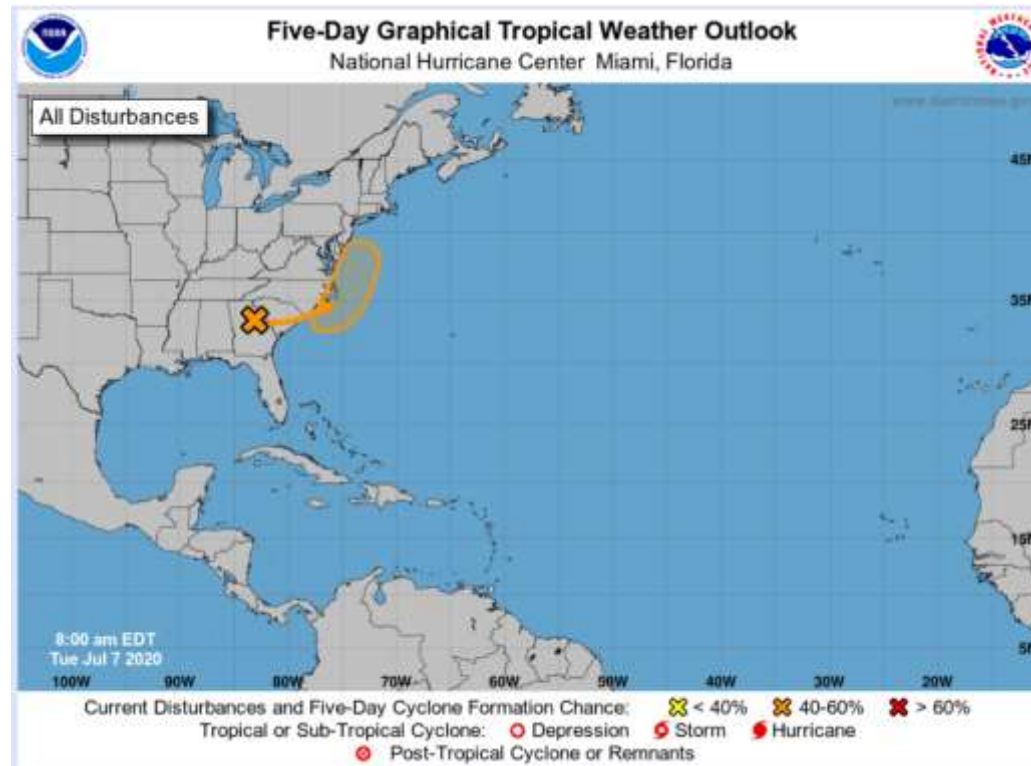
Normals:  
High temp: 81  
Low temp: 65

# Forecast for Springfield



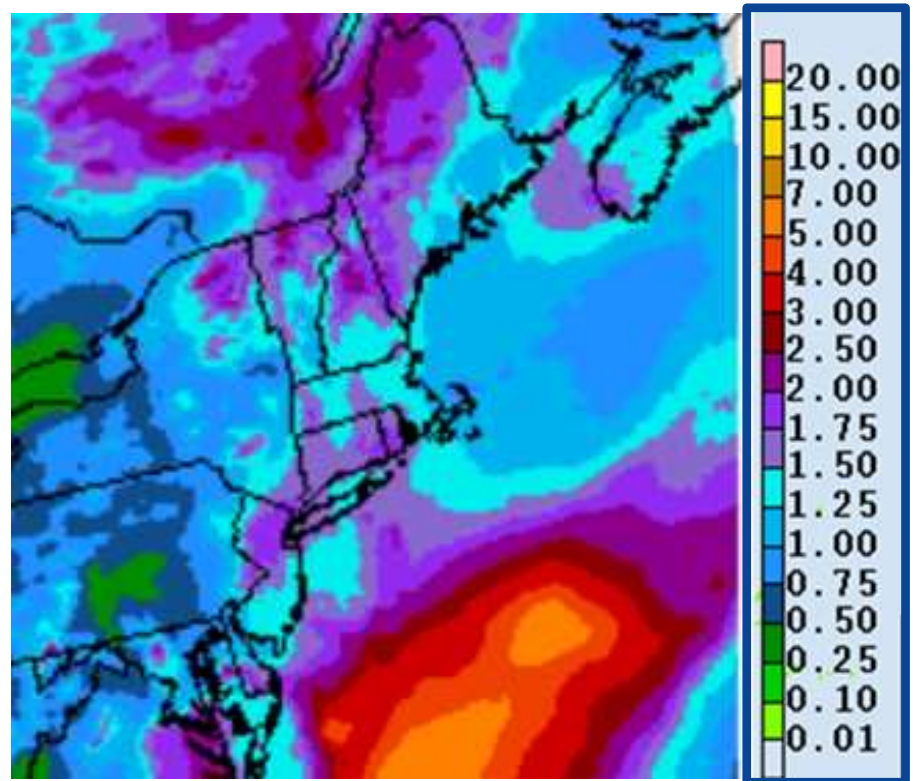
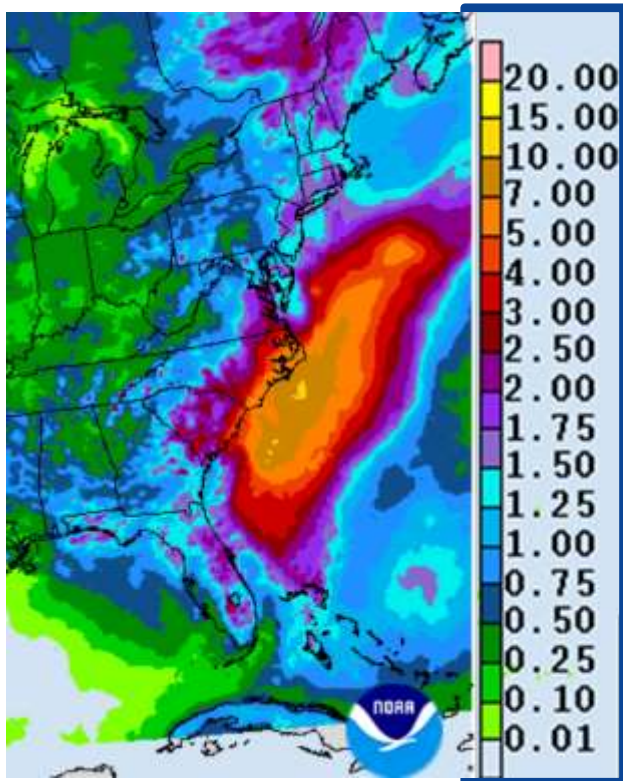
Normals:  
High temp: 82  
Low temp: 59

# Something to Watch During the Next Few Days...

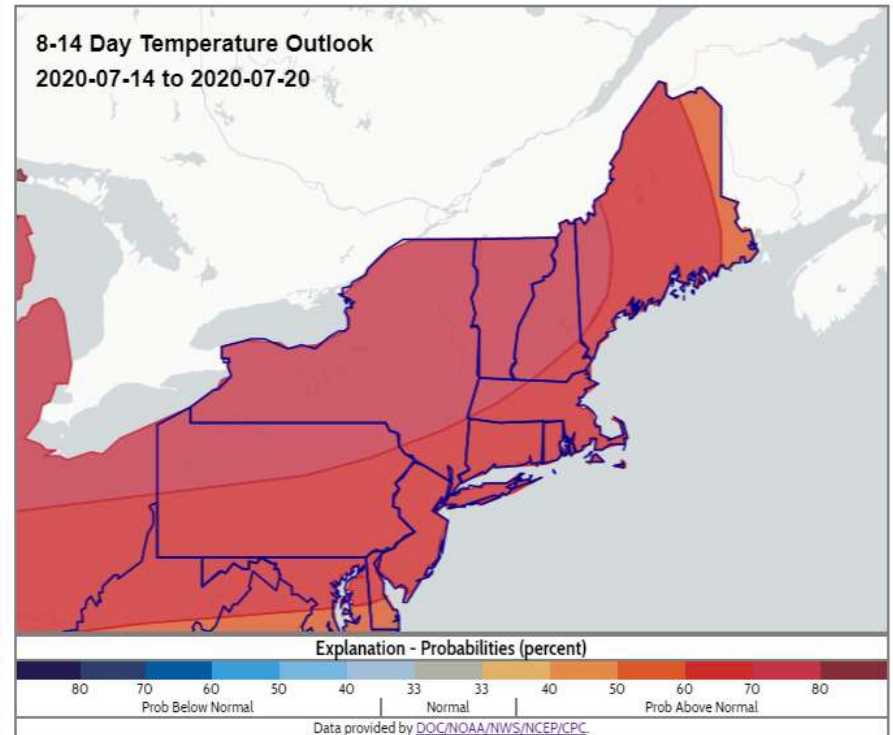
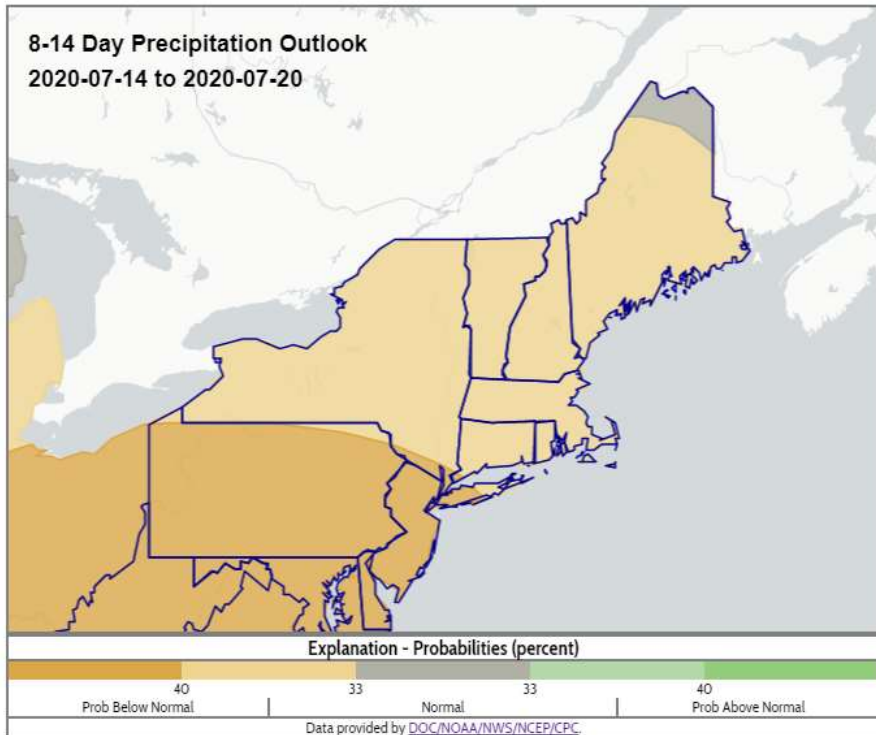


# Rainfall Forecast through 8 am Tue Jul 14th

## Normal 1 week rainfall ~1" in July

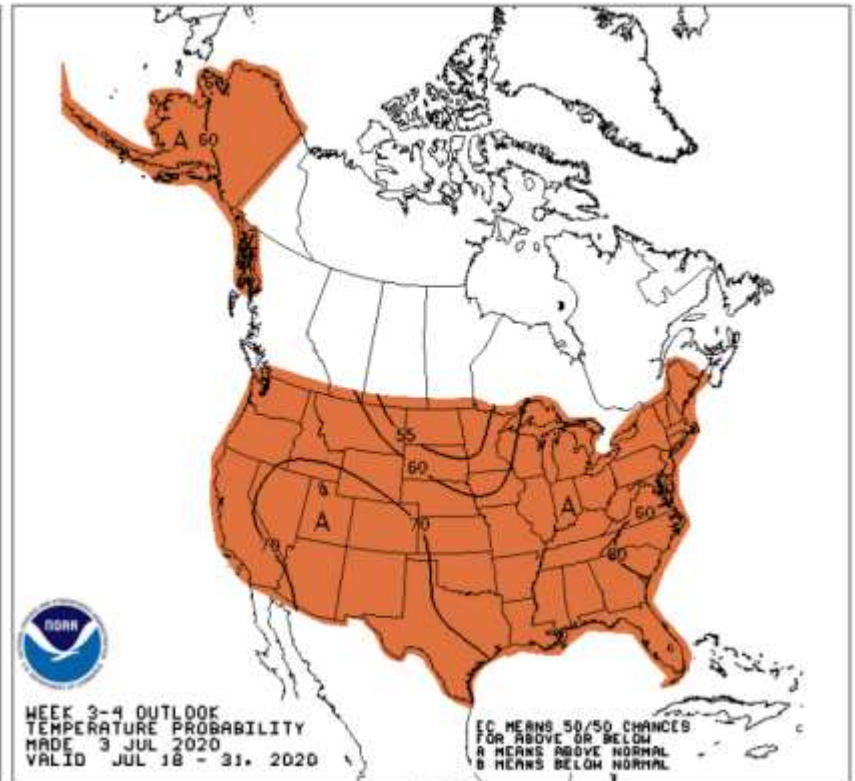
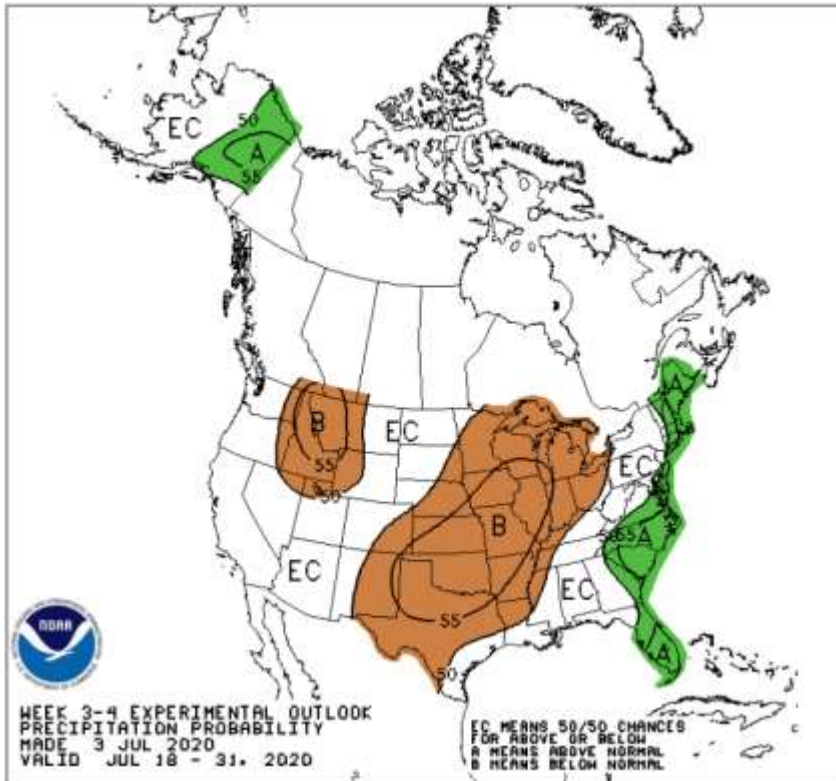


# Outlook for July 14-20, 2020

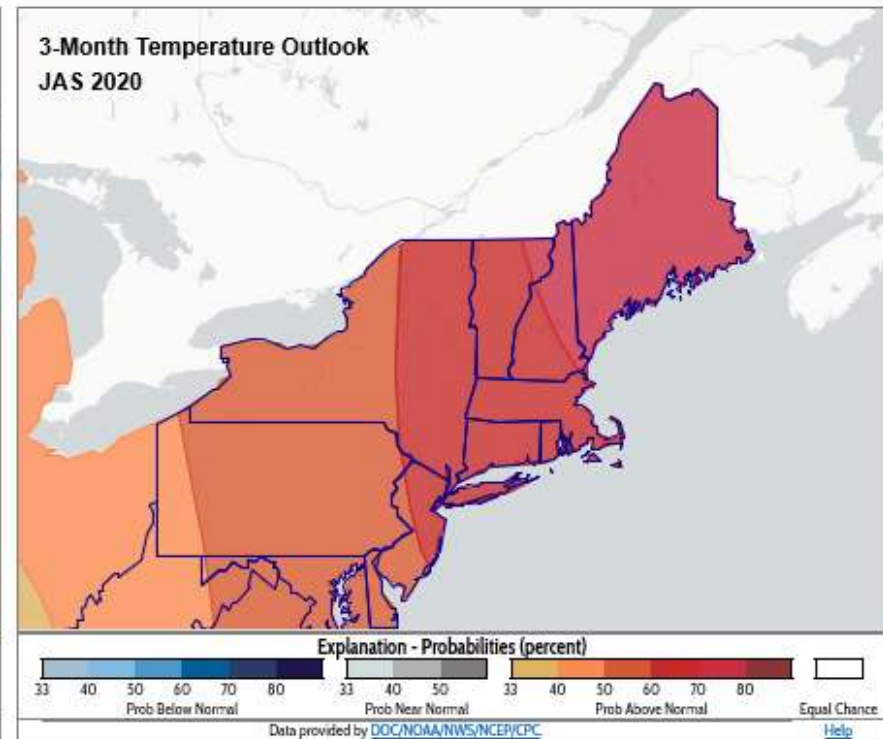
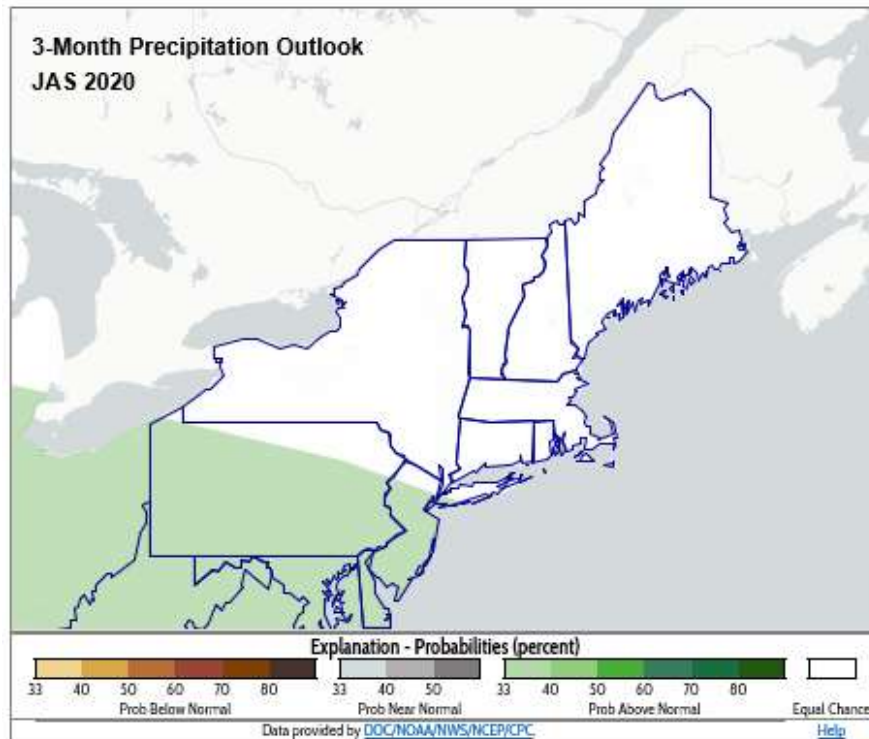


# Week 3-4 Outlook\*, July 18 to 31

\*Outlook updated at 3 pm EDT Friday



# 3 Month Outlook- July/August/September

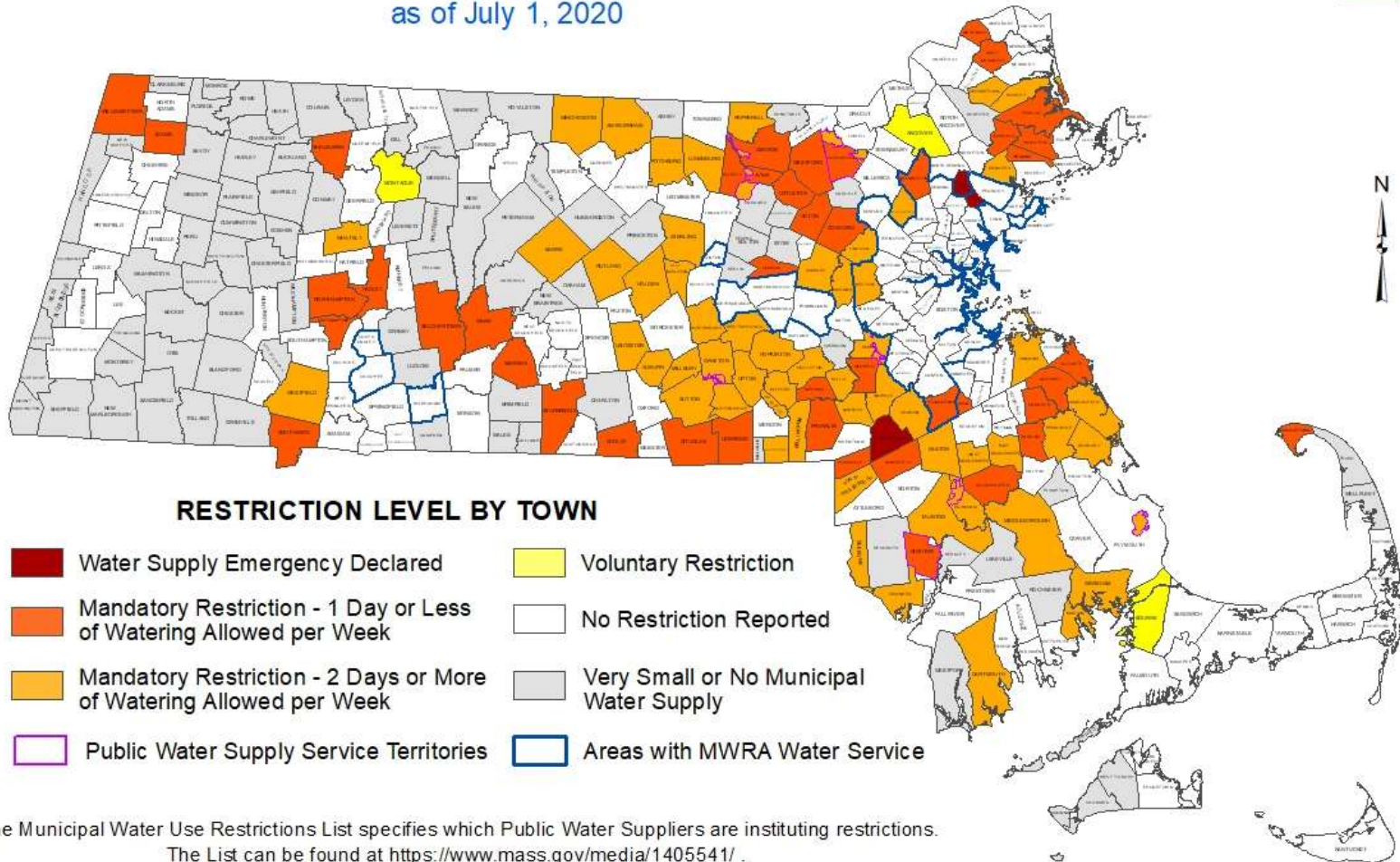




# CURRENT MUNICIPAL WATER USE RESTRICTIONS

## Non-Essential Outdoor Water Use Restrictions

as of July 1, 2020



The Municipal Water Use Restrictions List specifies which Public Water Suppliers are instituting restrictions.  
The List can be found at <https://www.mass.gov/media/1405541/>.

#### SOURCES:

MassDEP Bureau of Water Resources, Water Management Program; MassDEP GIS Program; MassGIS.  
Restriction Level data provided by municipal Public Water Suppliers or by MassDEP internet search.  
For more information contact MassDEP Water Management Program at 617-292-5706.

NOTE: Sub-town water supply service areas are approximate.



## Drought Management Task Force Update

07.07.20

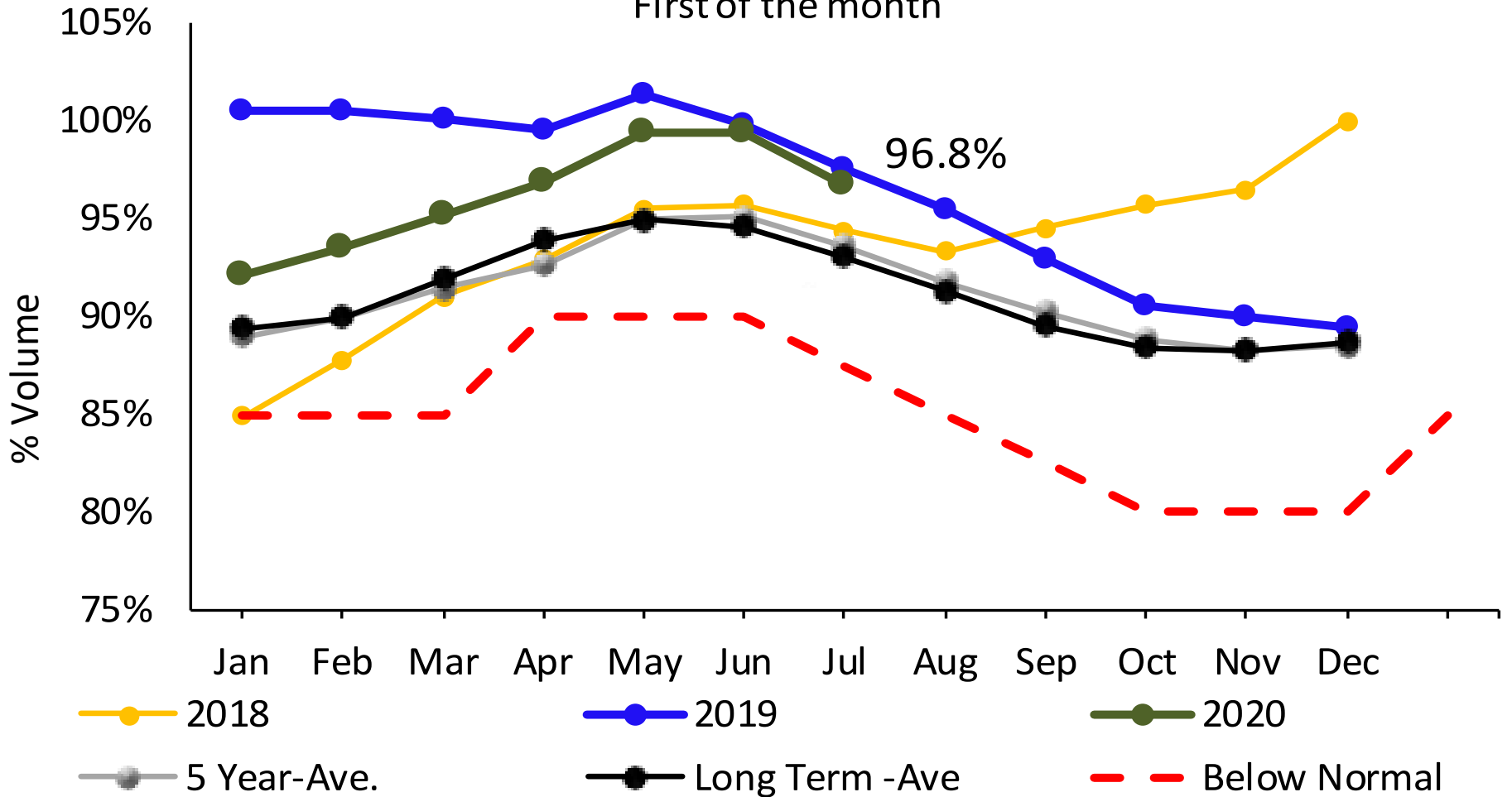
John Gregoire, Program Manager, Reservoir Operations



# Quabbin Reservoir

## Quabbin Reservoir Volume

First of the month

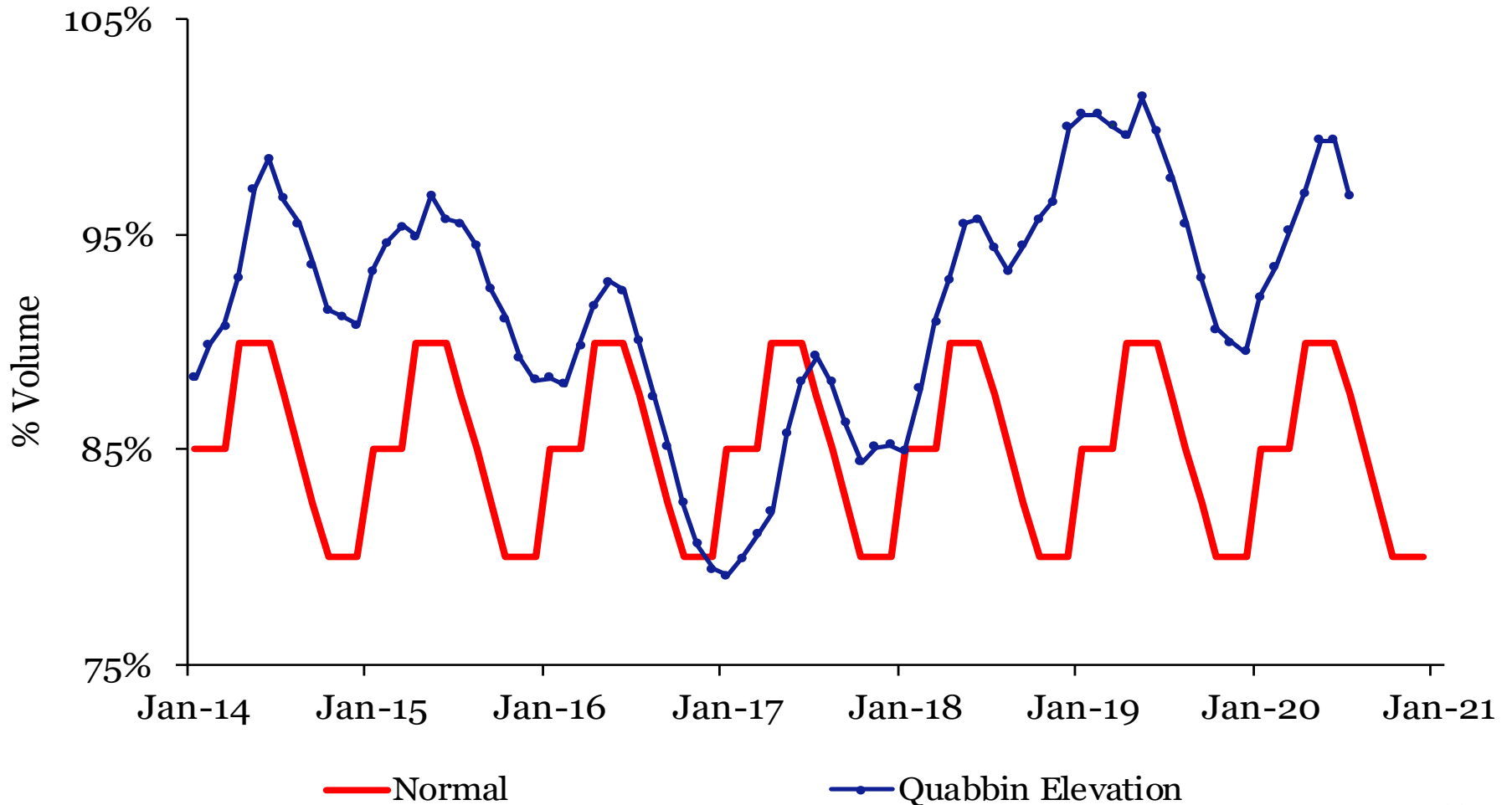




# Quabbin Reservoir

Date	Elevation	Volume	% Volume
7/7/20	528.18	398,086	96.6%
6/23/20	528.67	401,859	97.5%
Totals	-0.49	-3,773	-0.9%

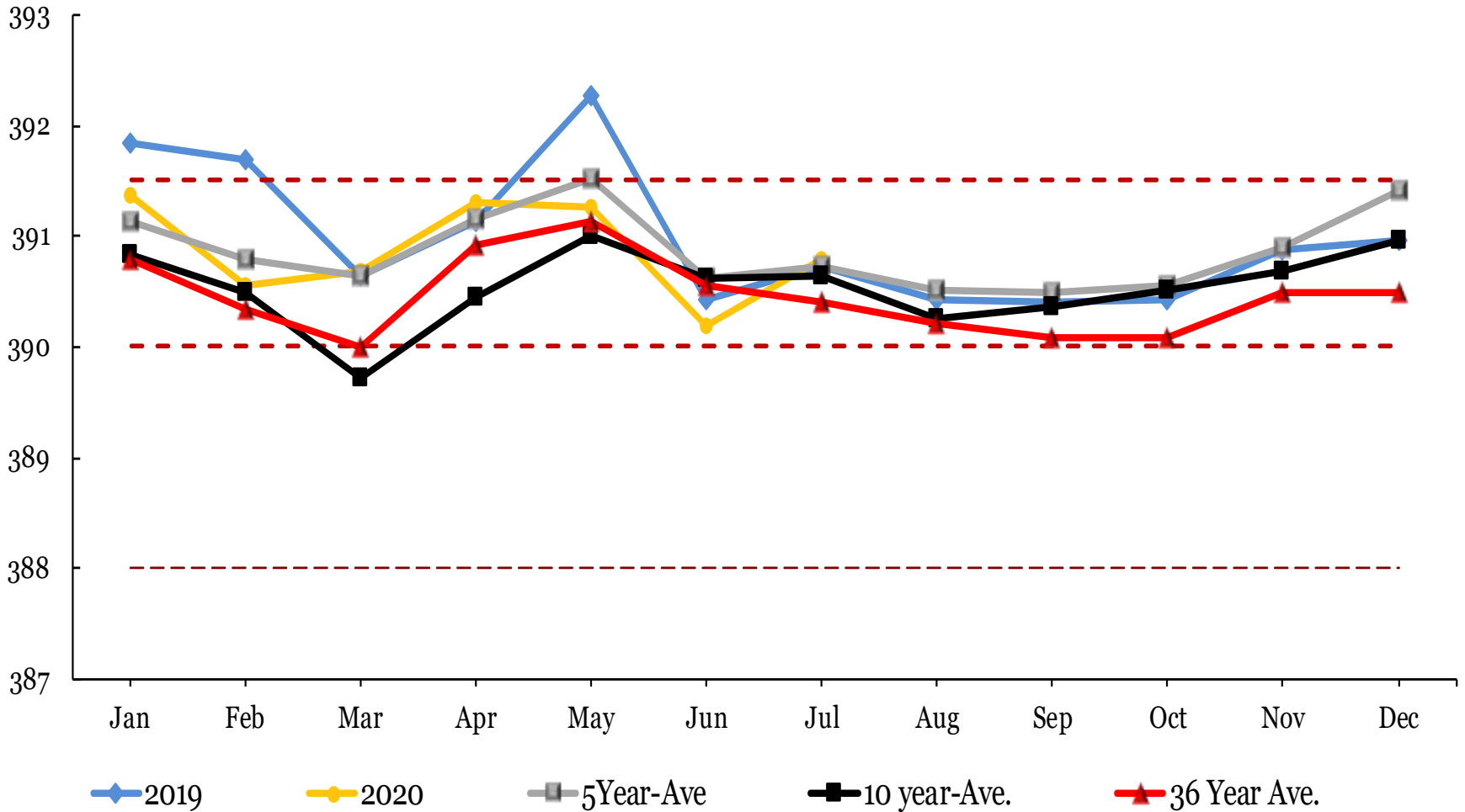
## Quabbin Reservoir Volume First of the Month





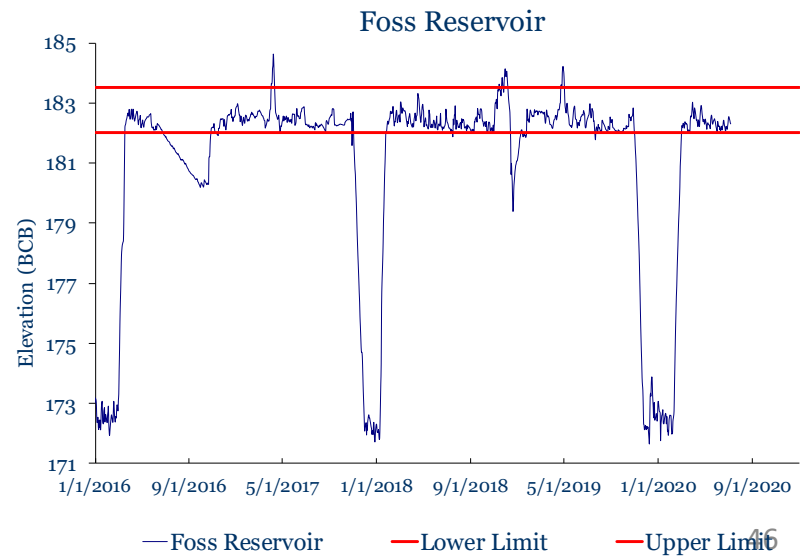
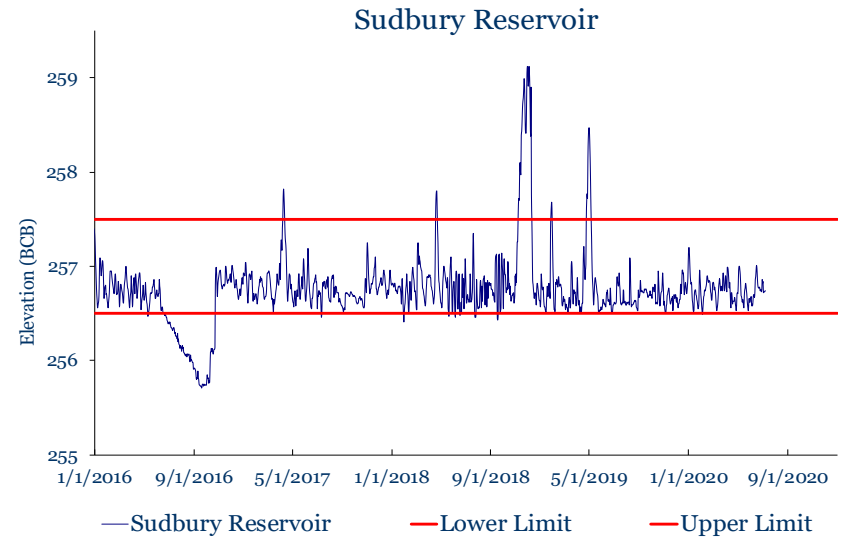
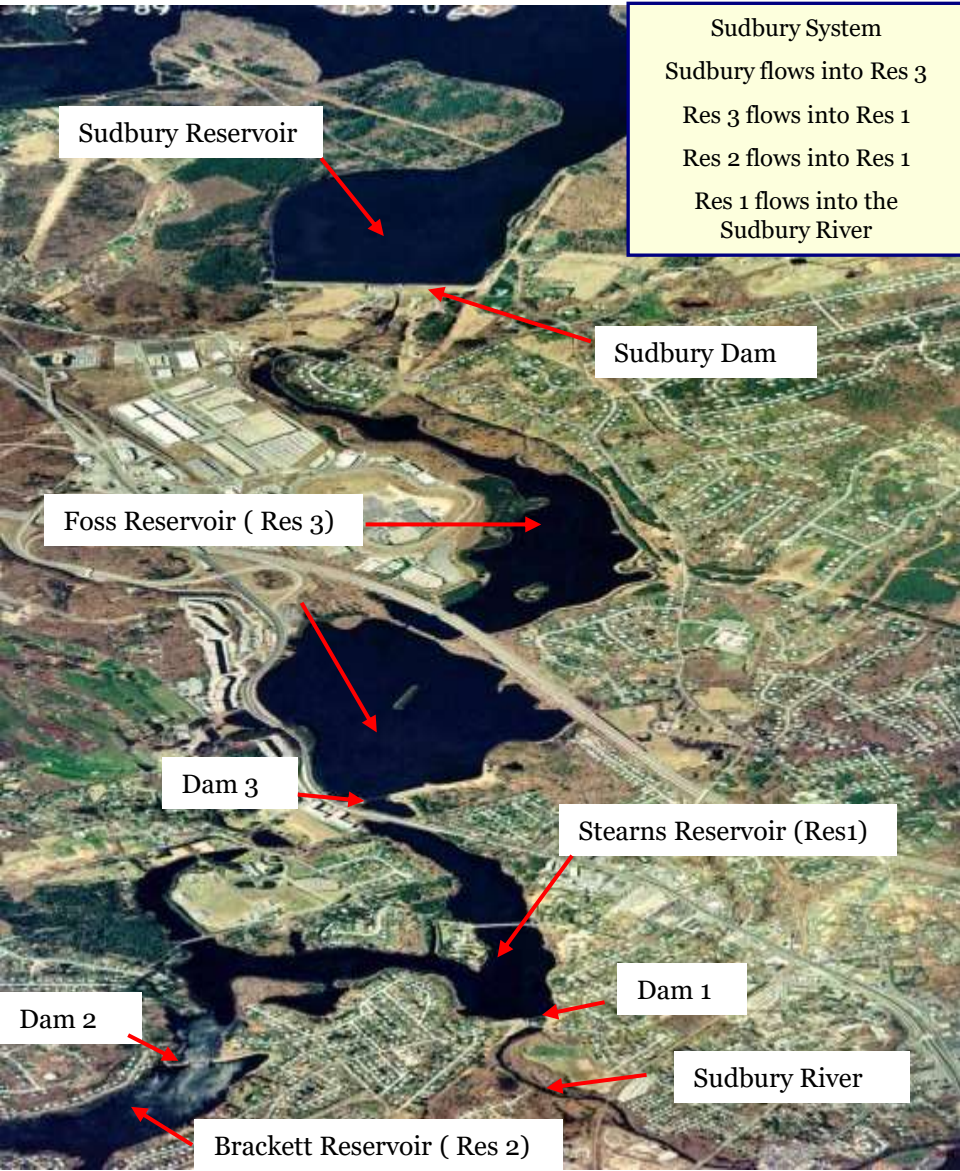
# Wachusett Reservoir

## Wachusett Reservoir Elevation





# Sudbury & Foss Reservoirs





## Messaging

- The MWRA system is well situated to withstand drought.
- Currently, MWRA's reservoirs are nearly full and well within their Normal Operating Range.
- No mandatory water use restrictions are required by MWRA fully-supplied communities. (Partially supplied communities may have DEP Water Management Act restrictions that they need to follow.)
- Last week MWRA reminded consumers that while there are no water use restrictions, they should continue to use water wisely.