

MASSACHUSETTS RIVER OVERVIEW



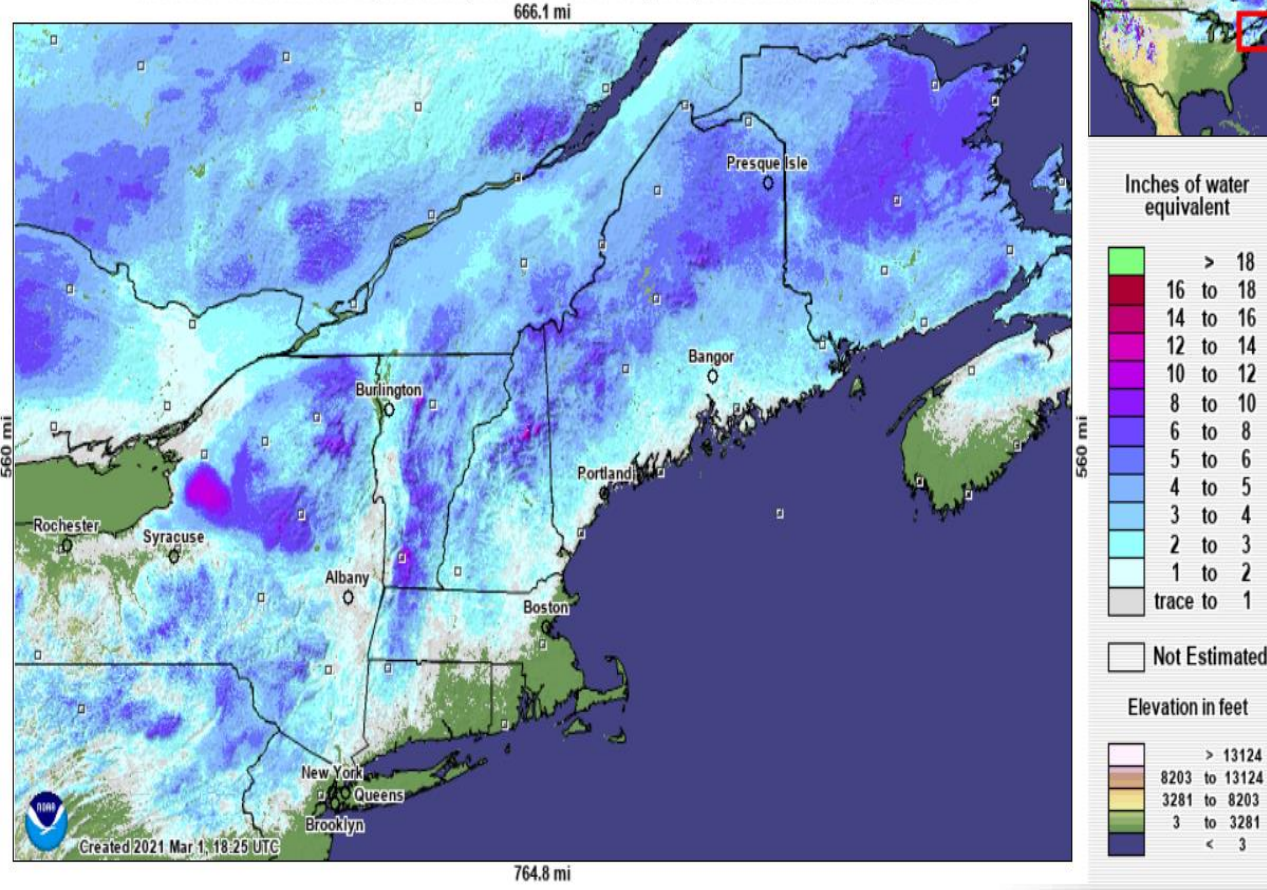
Ronald S.W. Horwood
Sr. Meteorologist
National Weather Service
Northeast River Forecast Center
Norton MA
MA Drought Management Task Force
6 April 2021

AGENDA

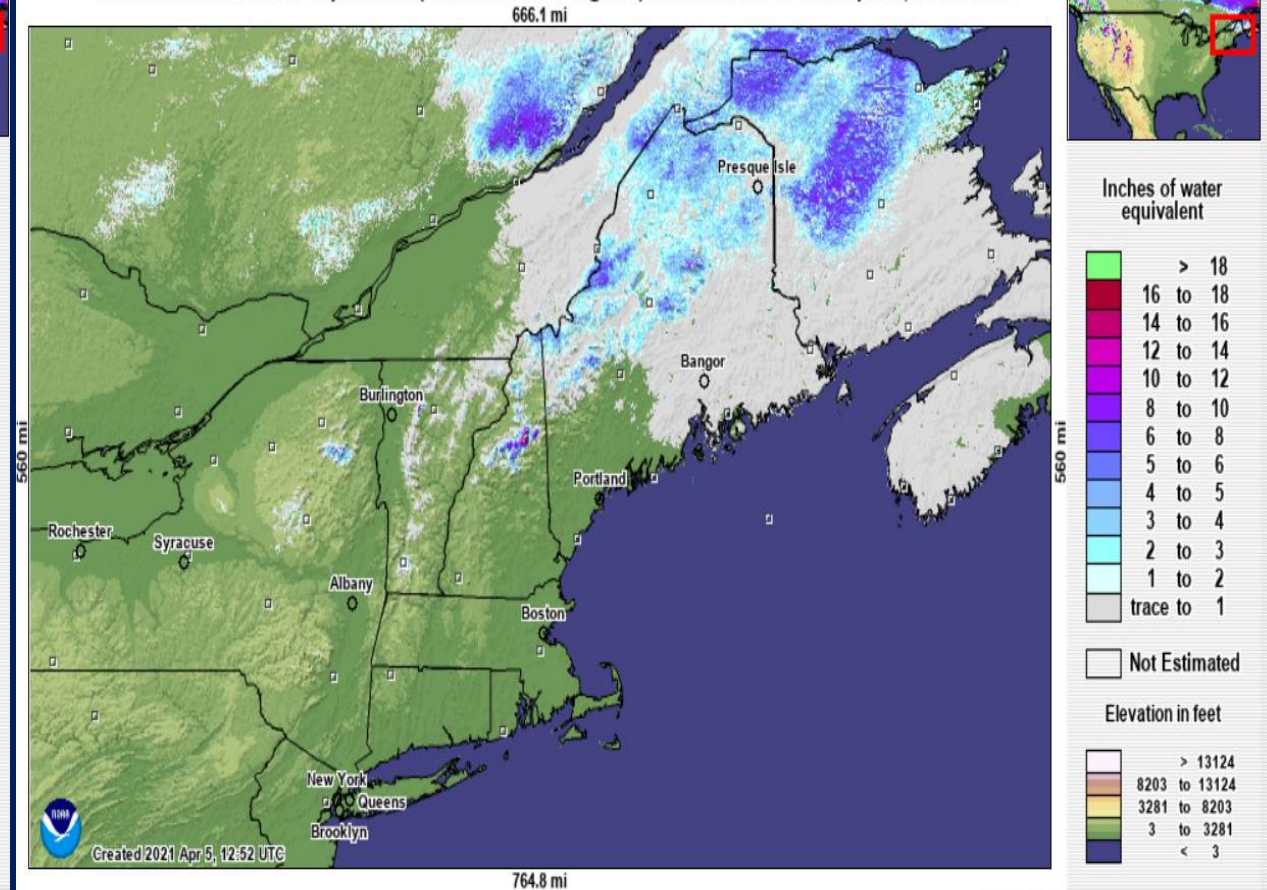
- Review of Snowmelt
- Current River Flow
- Current Groundwater Examples
- Near term river outlooks
- Drought Outlook
- Conclusions

REVIEW OF SNOWMELT

Modeled Snow Water Equivalent (Shallow-snow Legend) for 2021 March 1, 12:00 UTC



Modeled Snow Water Equivalent (Shallow-snow Legend) forecasted for 2021 April 5, 12:00 UTC



Heading into March 2021...there were 3 to 6 inches of water in the Berkshires available for melt runoff/recharge and 1 to 3 inches across the high terrain of north central Massachusetts

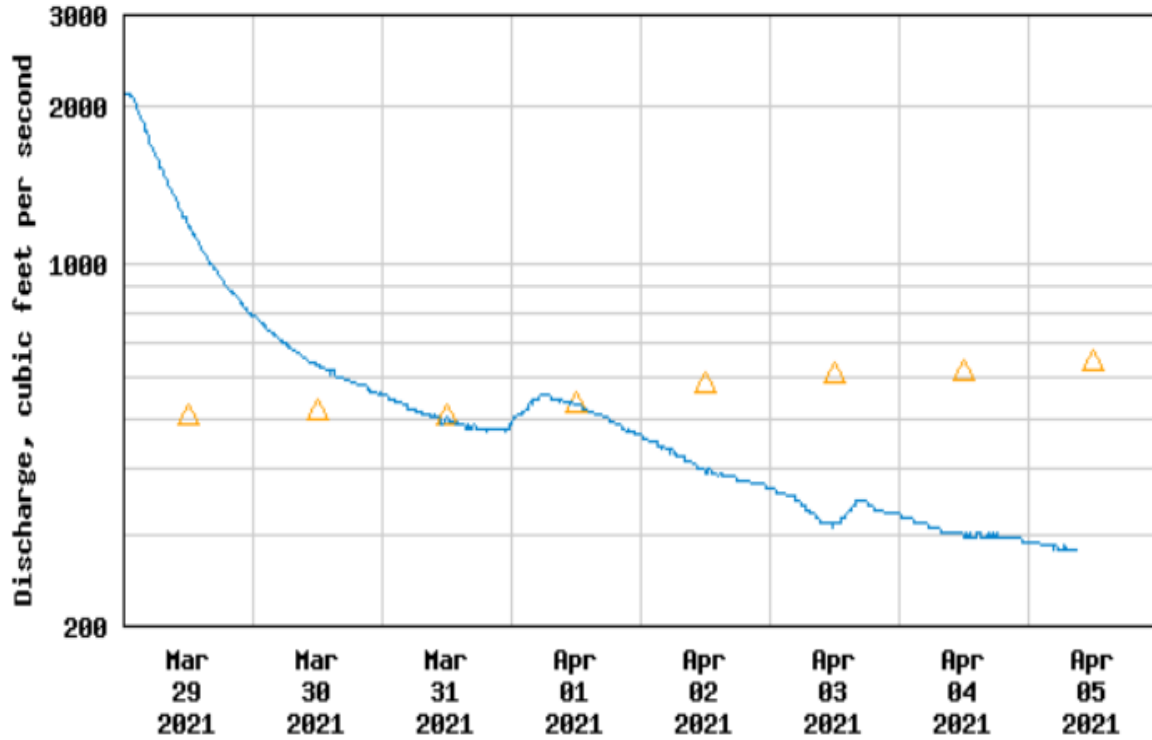
Snow will no longer “save the day” as of 5 April

CURRENT RIVER FLOW

- With the loss of snow and a dry pattern continuing...river flows across a lot of western and central Massachusetts have been declining.
- A couple of significant rain events along and south of Interstate 95 have kept river flows closer to normal across southeast portions of the Commonwealth.

RIVER FLOW - cont

USGS 01332500 HOOSIC RIVER NEAR WILLIAMSTOWN, MA

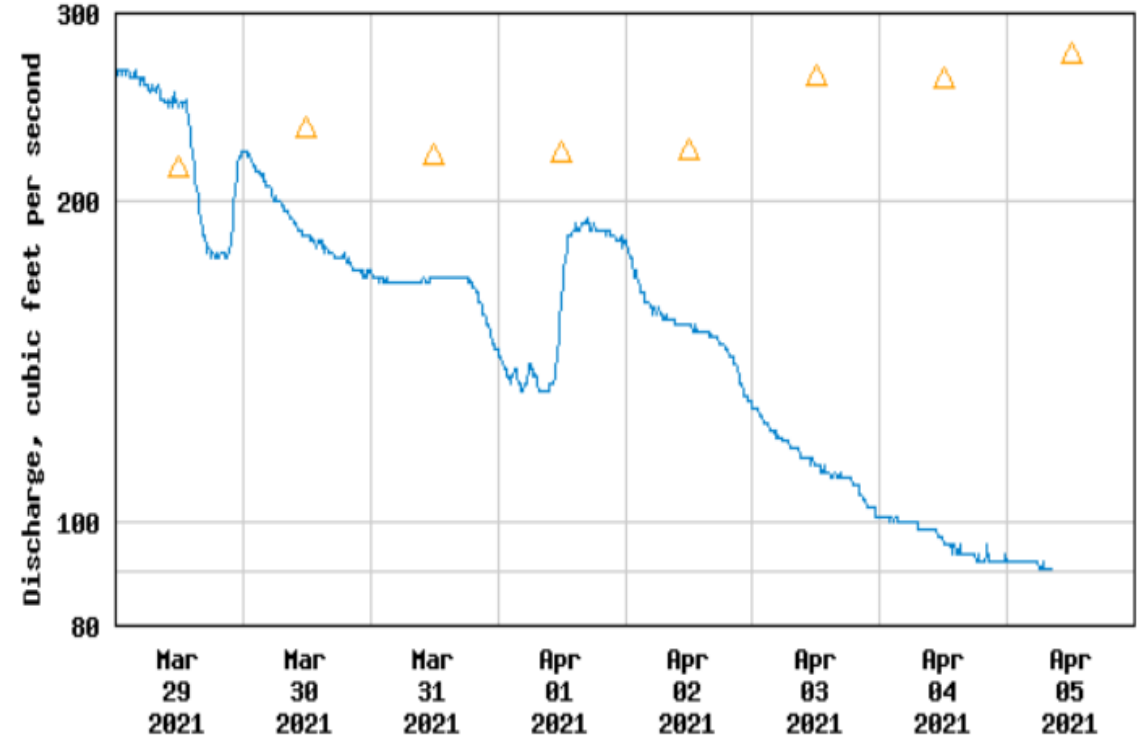


----- Provisional Data Subject to Revision -----

△ Median daily statistic (80 years) — Discharge

Berkshires

USGS 01094400 NORTH NASHUA RIVER AT FITCHBURG, MA



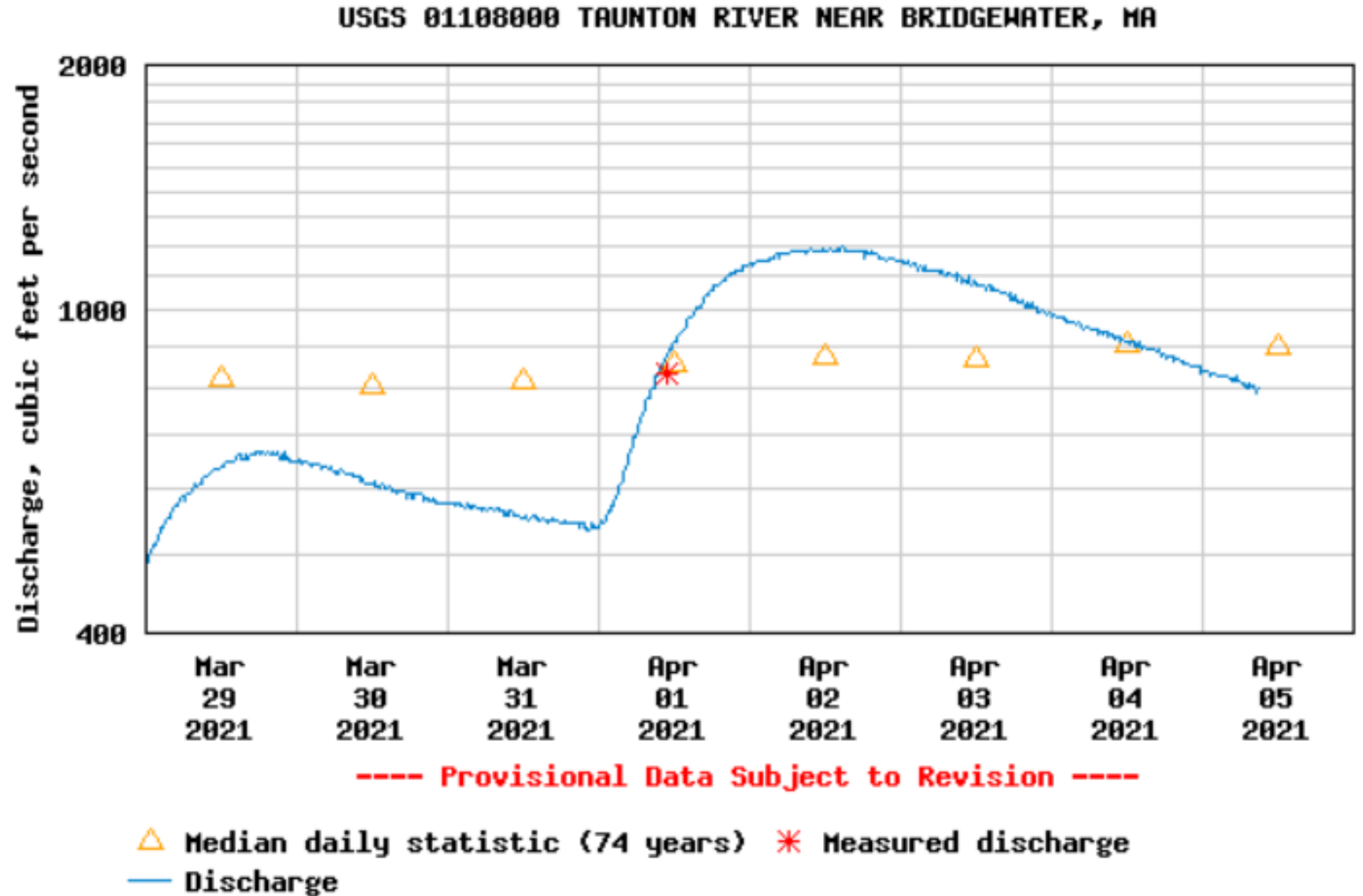
----- Provisional Data Subject to Revision -----

△ Median daily statistic (48 years) — Discharge

North Central Massachusetts

RIVER FLOW - cont

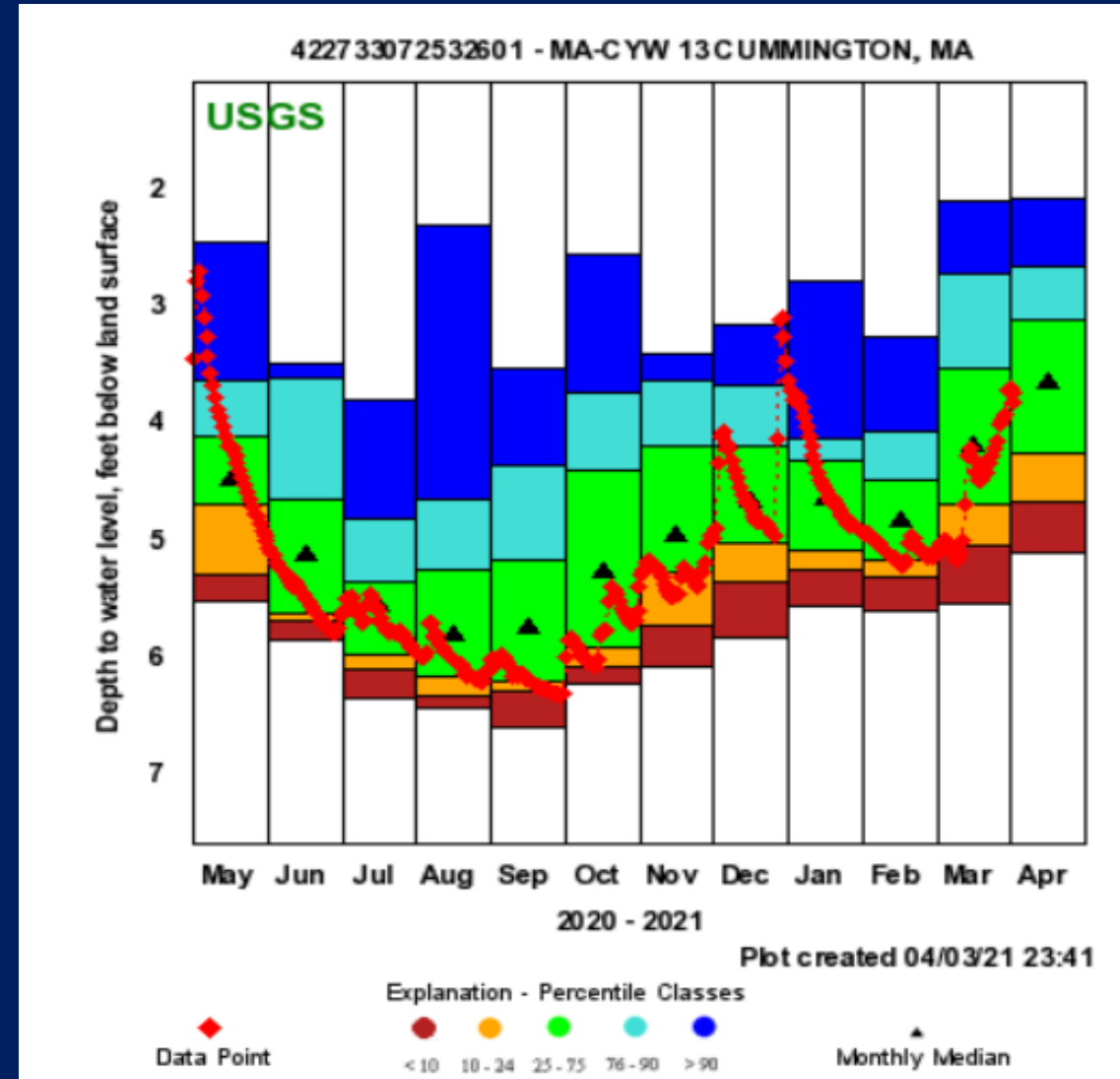
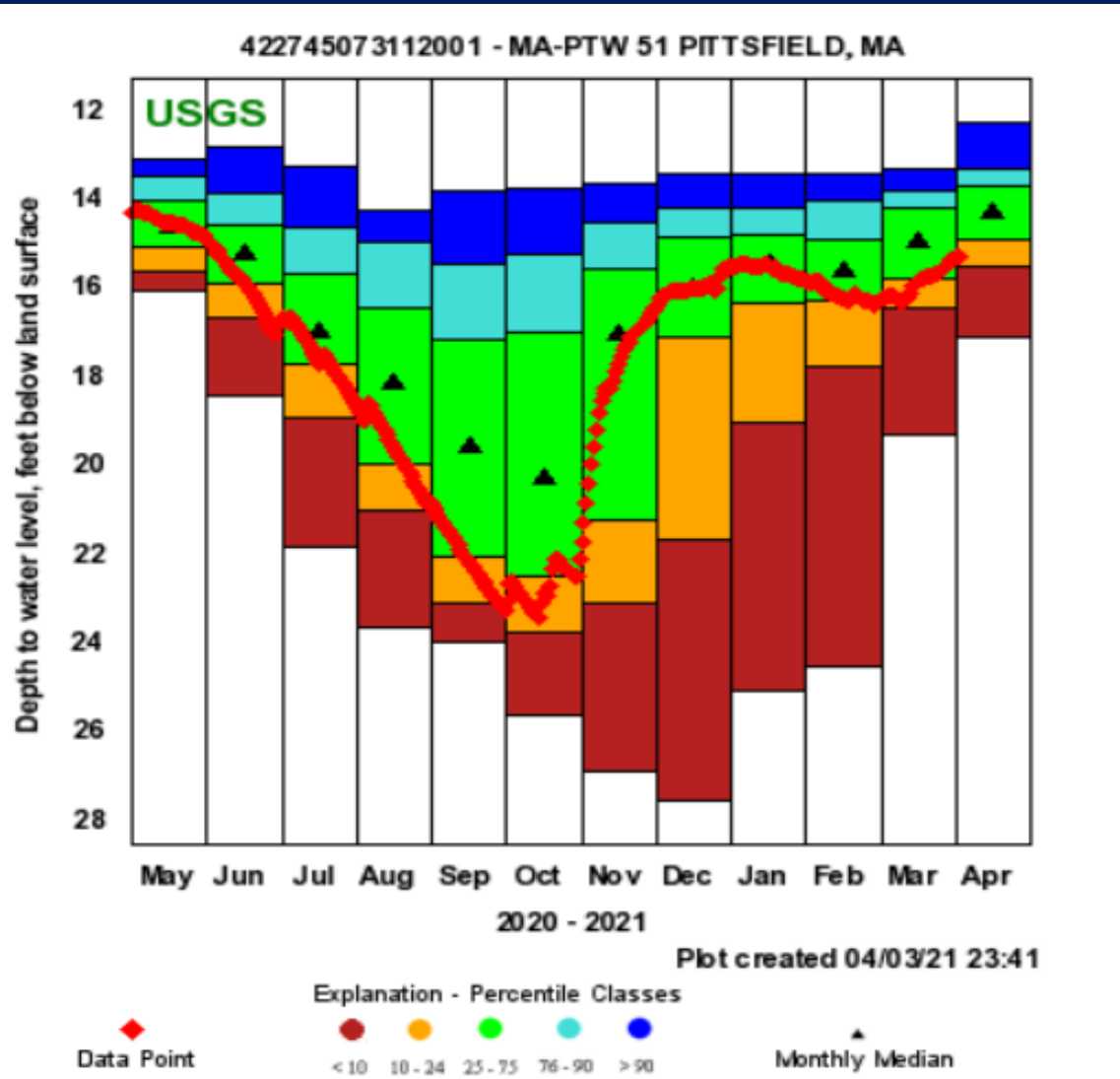
- Note the benefit of the 2 rainfall events



GROUNDWATER

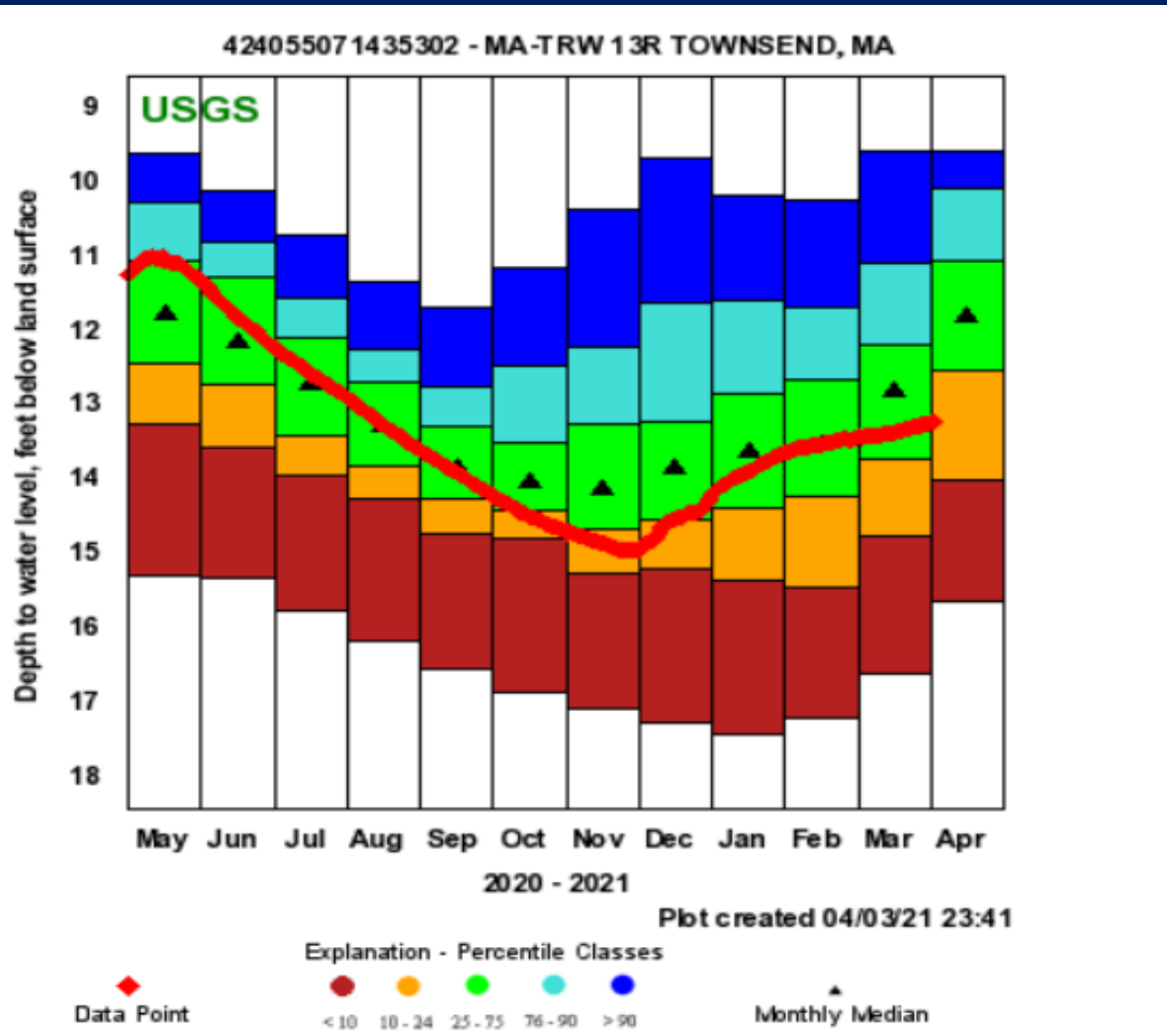
- Groundwater has been recharging in the Berkshires due to snowmelt but this has been partially offset by a very dry weather pattern.
- Most of the Commonwealth is seeing groundwater levels near to below normal heading into Spring 2021.

GROUNDWATER - cont

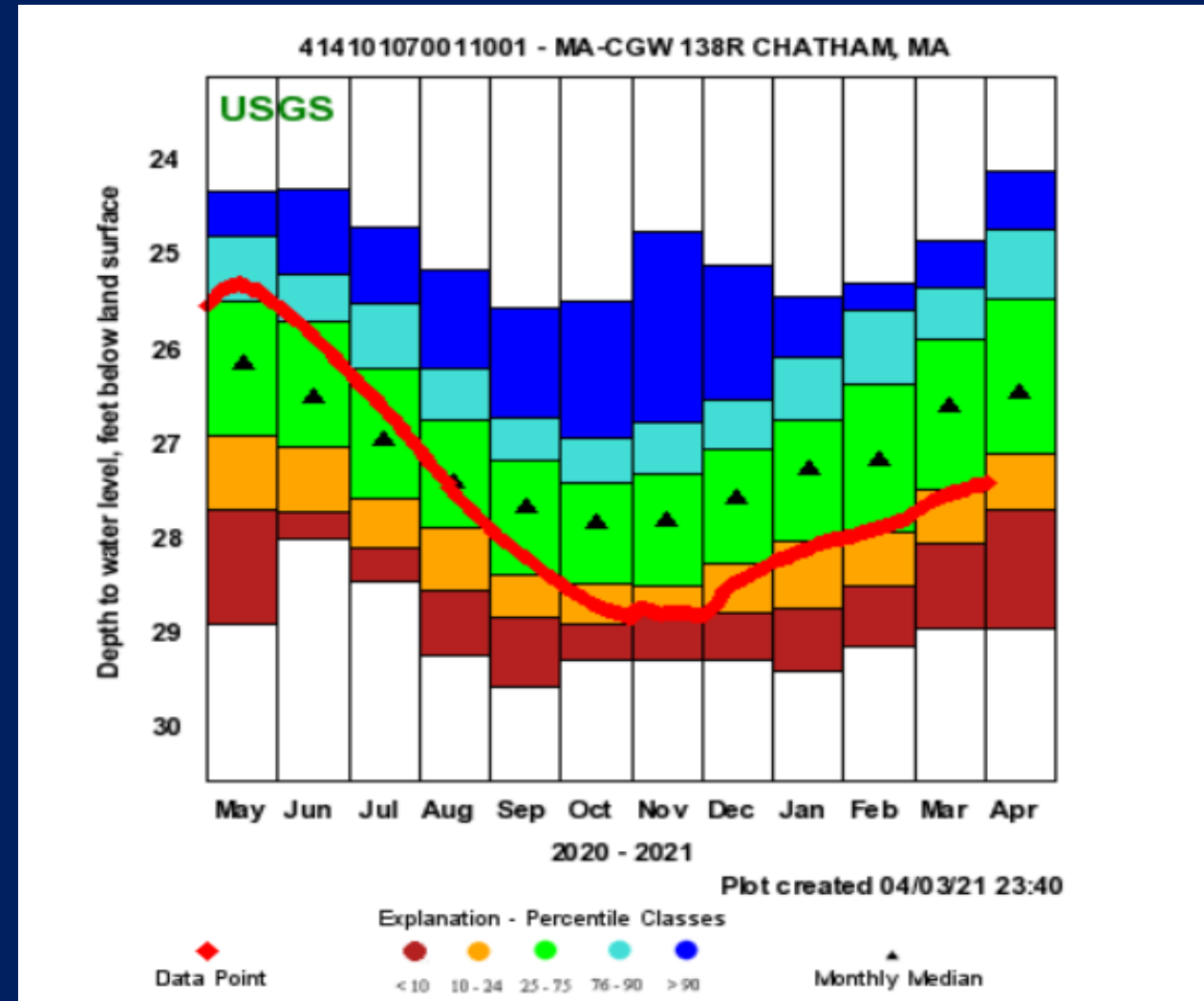


Western Massachusetts Groundwater Wells

GROUNDWATER - cont



North Central Massachusetts



Cape Cod

NEAR TERM RIVER OUTLOOK

- With no snow left to melt and a rather dry precipitation forecast...there is little hope for significant increases in river flow through mid-April
- Lets check out a few simulations...

NEAR TERM RIVER OUTLOOK - cont



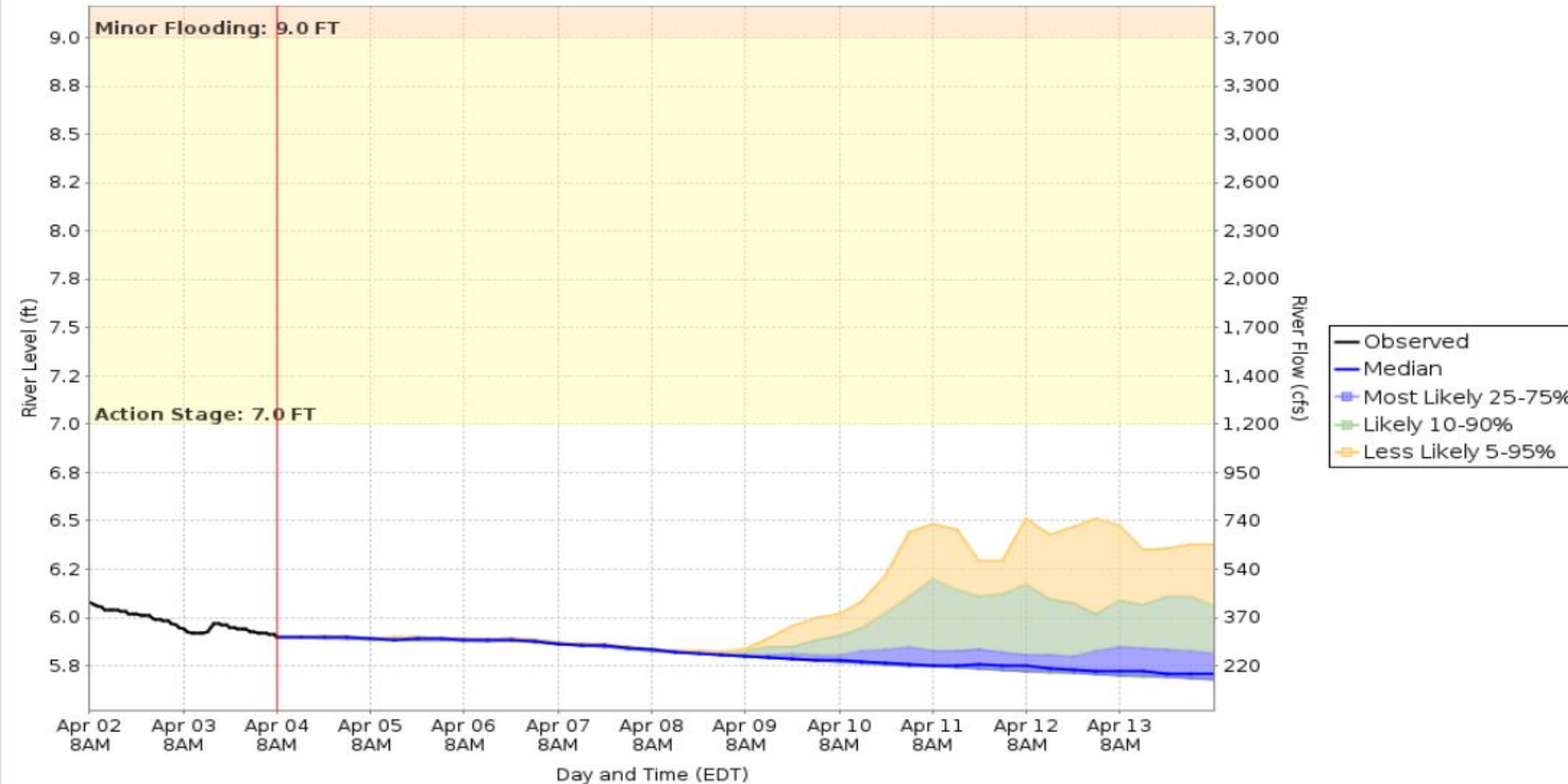
10 Day River Level Probabilities

Used to Estimate the Range of Possible River Levels

Caution: Official forecast may be updated after this graph is generated.
For the latest official forecast, go to <http://water.weather.gov/ahps>



Hoosic River at Williamstown, MA (WILM3)



Most likely scenario is for declining stages into mid-April

NEAR TERM RIVER OUTLOOK - cont



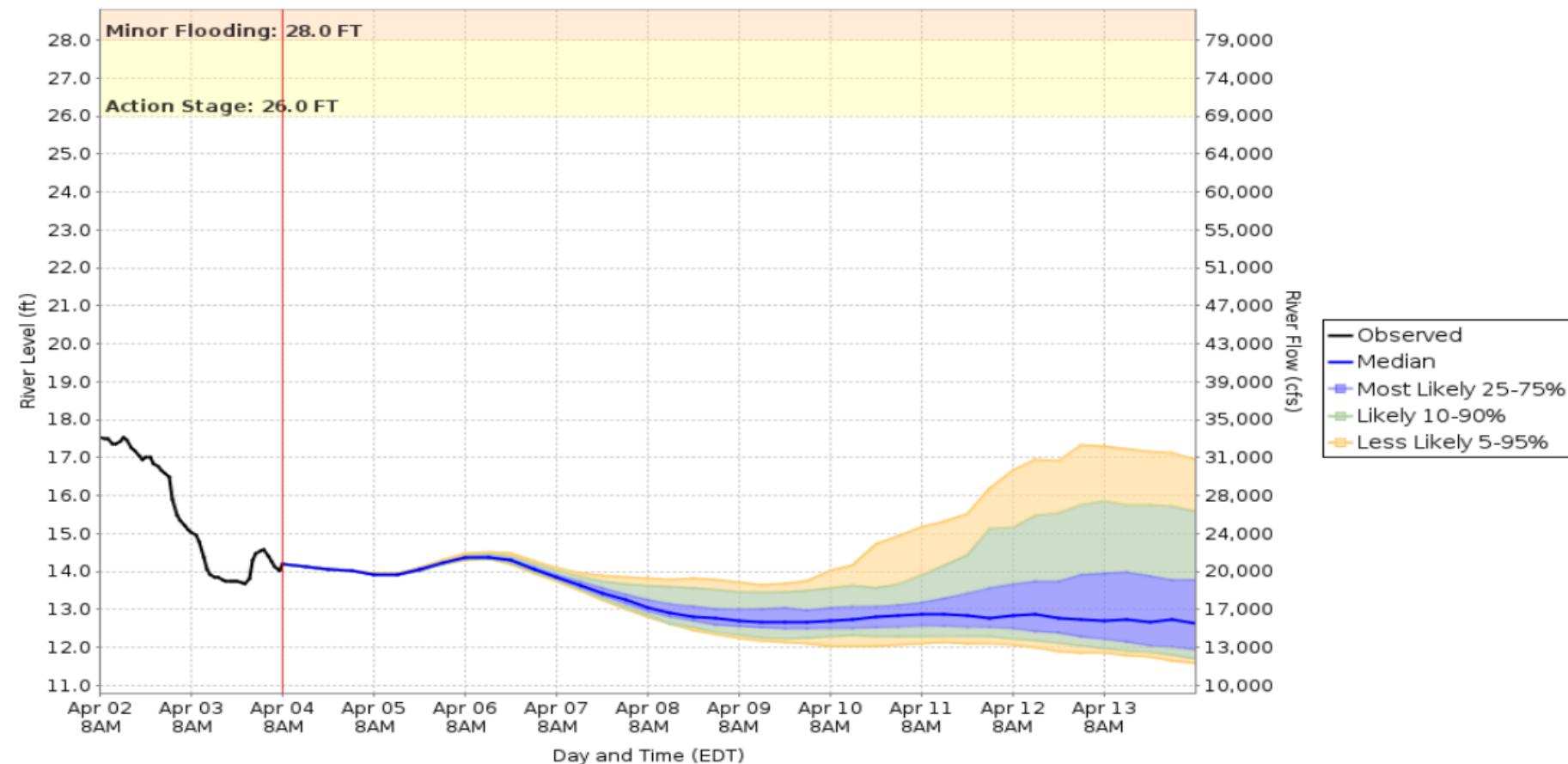
10 Day River Level Probabilities

Used to Estimate the Range of Possible River Levels

Caution: Official forecast may be updated after this graph is generated.
For the latest official forecast, go to <http://water.weather.gov/ahps>



Connecticut River at Montague, MA (MNTM3)



- No significant snow left in northern New England

NEAR TERM RIVER OUTLOOK - cont



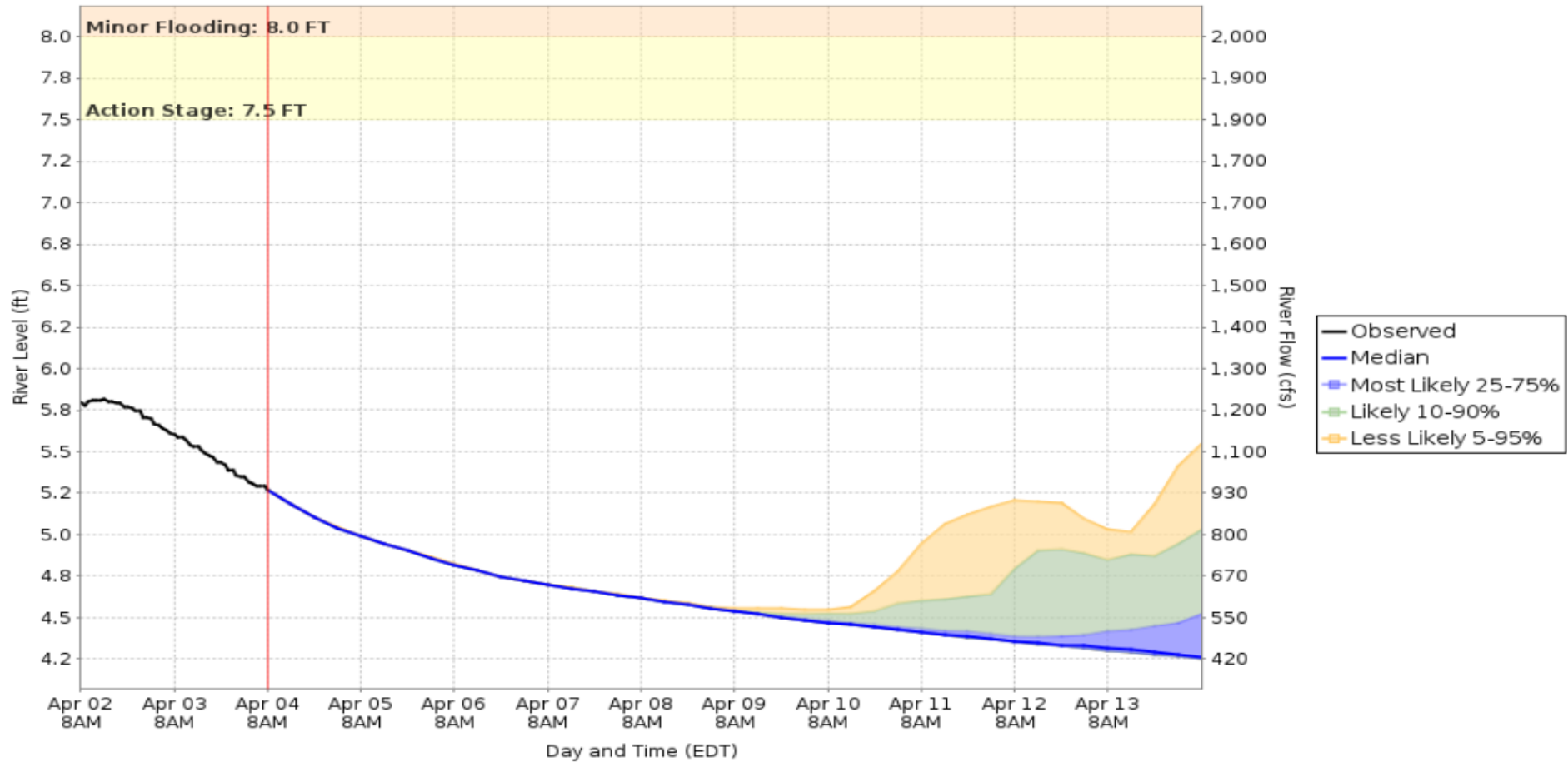
10 Day River Level Probabilities

Used to Estimate the Range of Possible River Levels

Caution: Official forecast may be updated after this graph is generated.
For the latest official forecast, go to <http://water.weather.gov/ahps>



Taunton River at Bridgewater, MA (BDGM3)

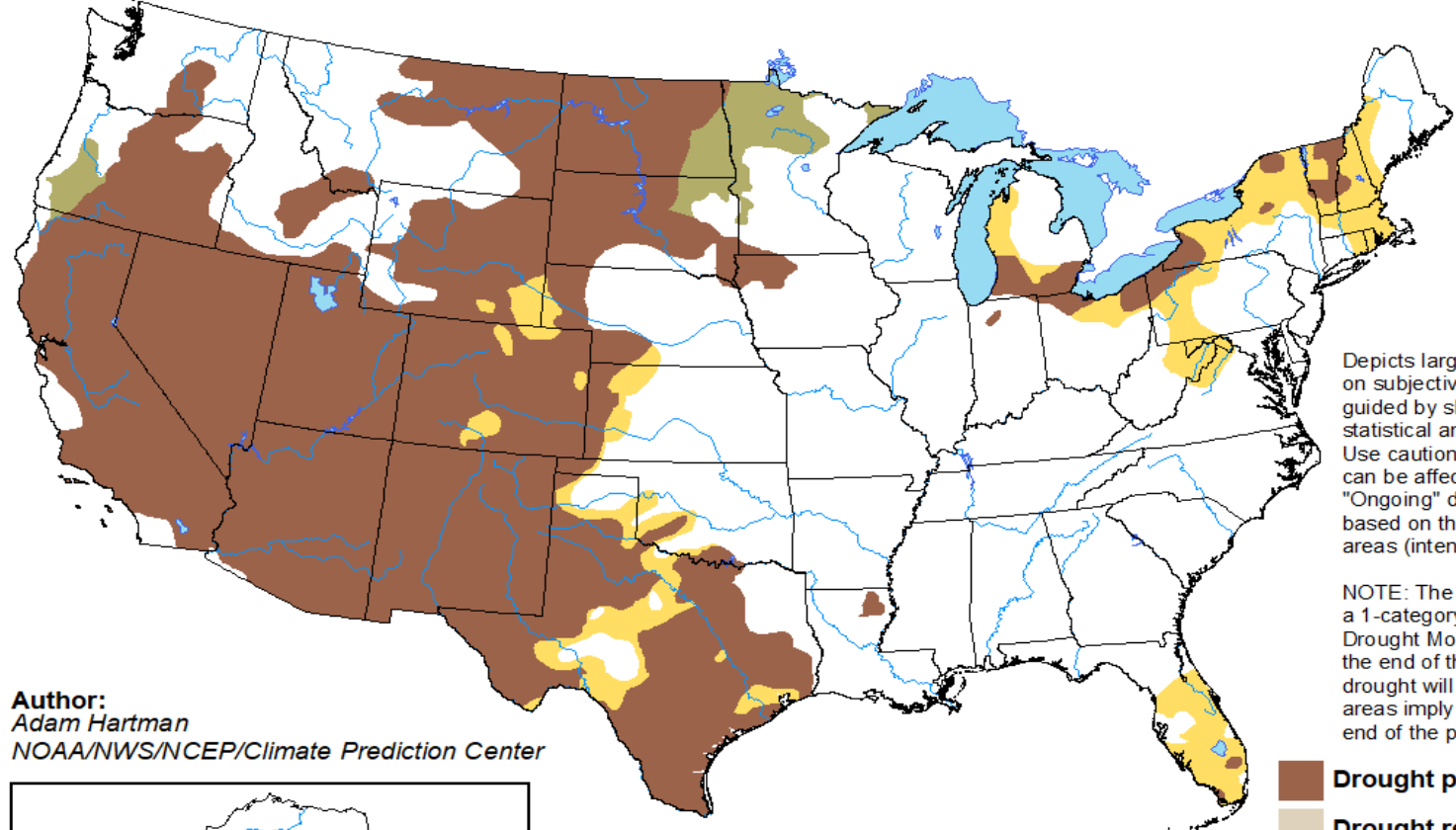


- Same story: little chance for river rises into mid-April

DROUGHT OUTLOOK

U.S. Monthly Drought Outlook **Drought Tendency During the Valid Period**

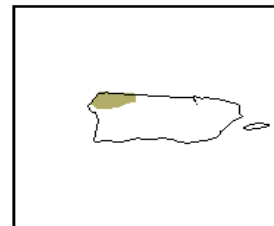
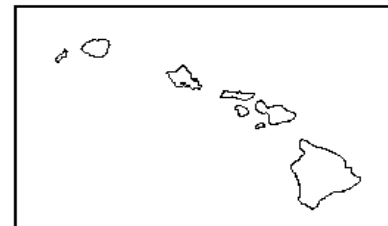
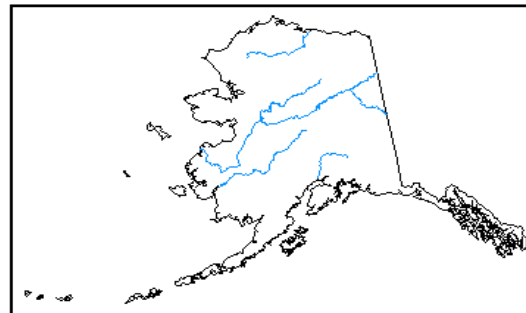
Valid for April 2021
Released March 31, 2021







Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author:
Adam Hartman
NOAA/NWS/NCEP/Climate Prediction Center



-  **Drought persists**
-  **Drought remains but improves**
-  **Drought removal likely**
-  **Drought development likely**



<http://go.usa.gov/3eZGd>

- NOAA outlook...which was for drought improvement a month ago...now calls for likely deterioration across much of Massachusetts

CONCLUSIONS

- River flows are in steady decline due to both the loss of snowmelt for recharge and a very dry precipitation pattern since 1 March 2021 (southeast Mass faring a little better).
- Little relief is seen in near term river ensemble forecast members (although flows are highest this time of year).
- Growing season will begin soon which will increase evapotranspiration and make recharge more difficult.
- NOAA now forecasting drought expansion likely across much of Massachusetts during April.

QUESTIONS??

