



MASSACHUSETTS RIVER OVERVIEW



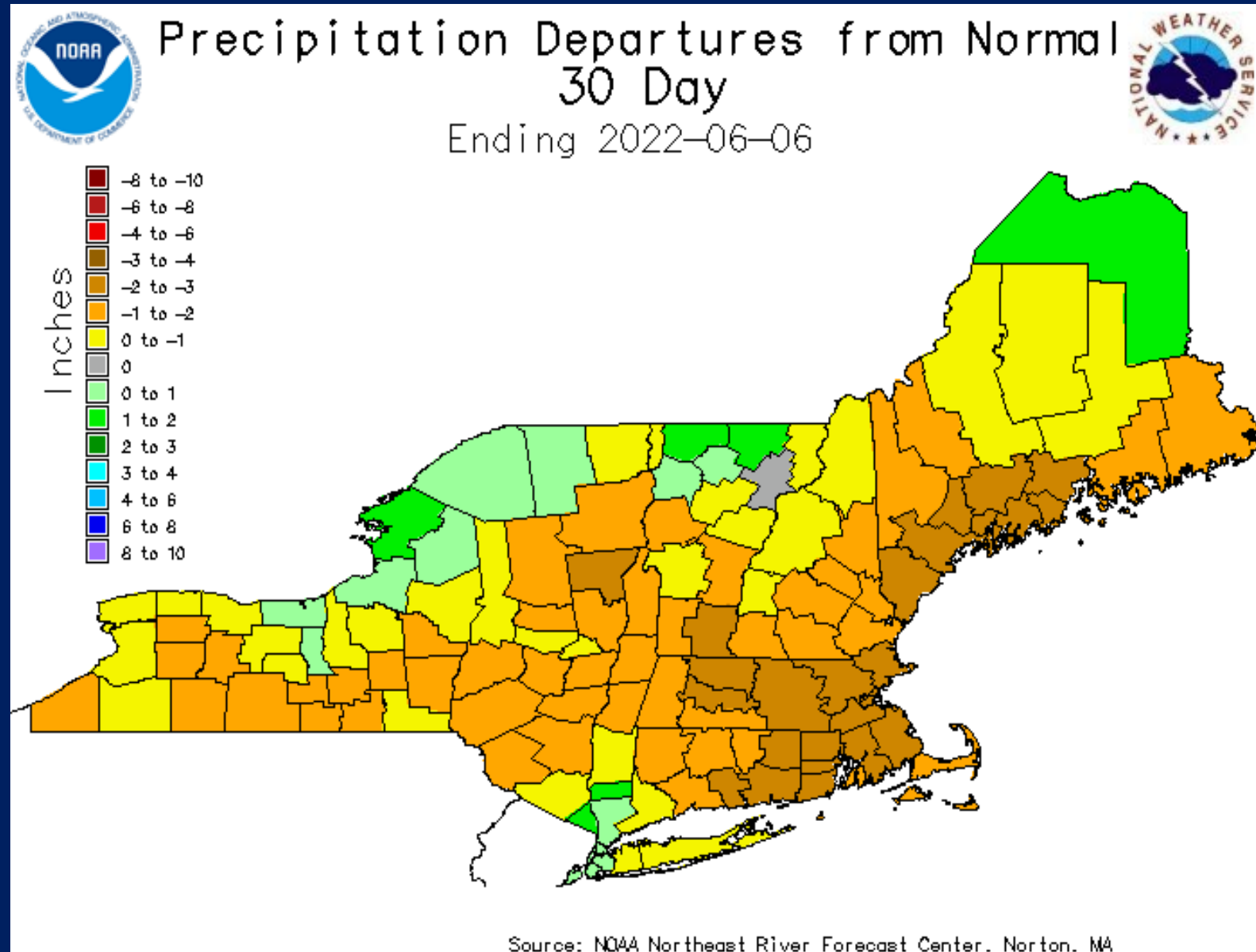
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MA Drought Management Task Force
9 June 2022

OUTLINE

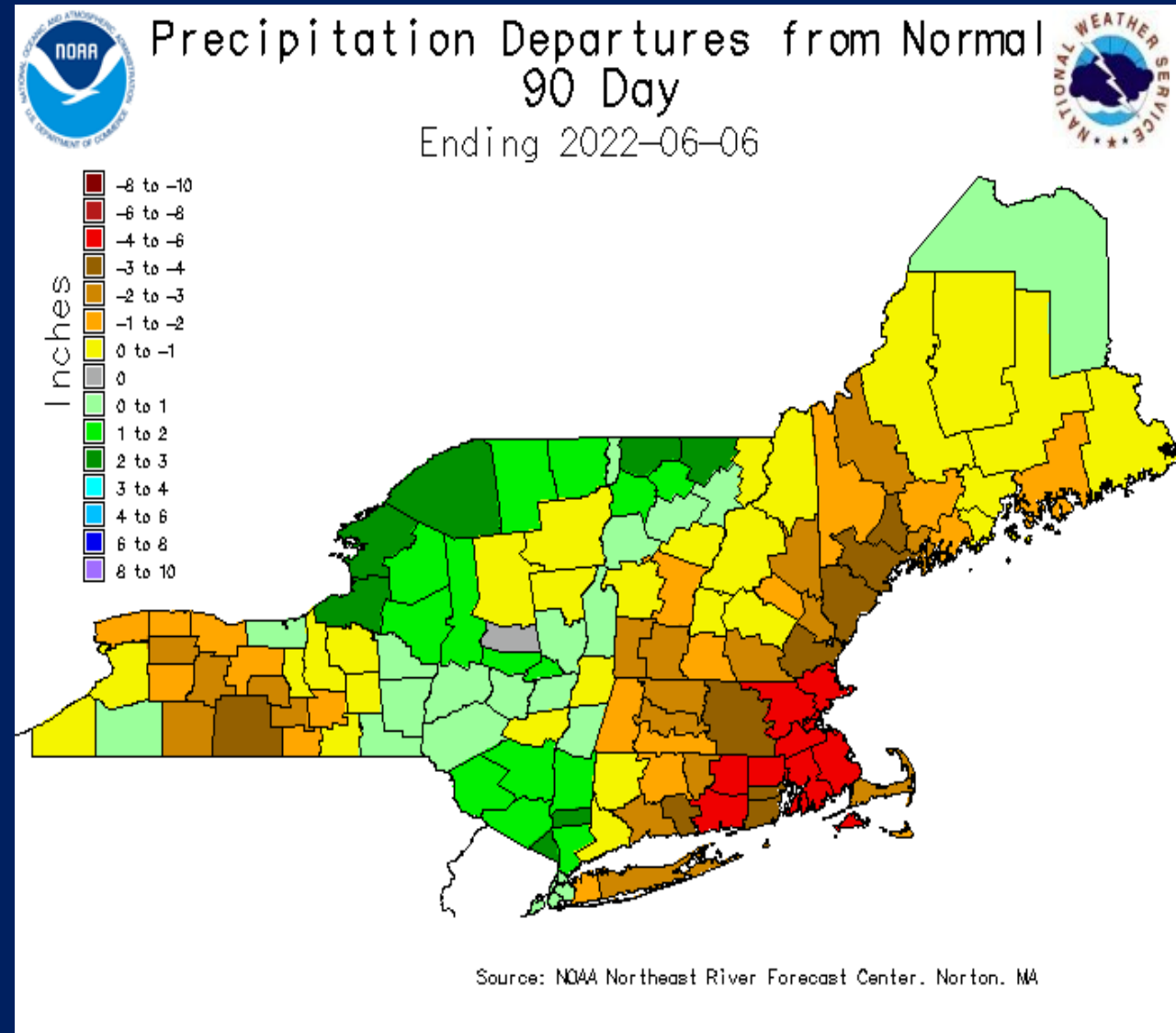
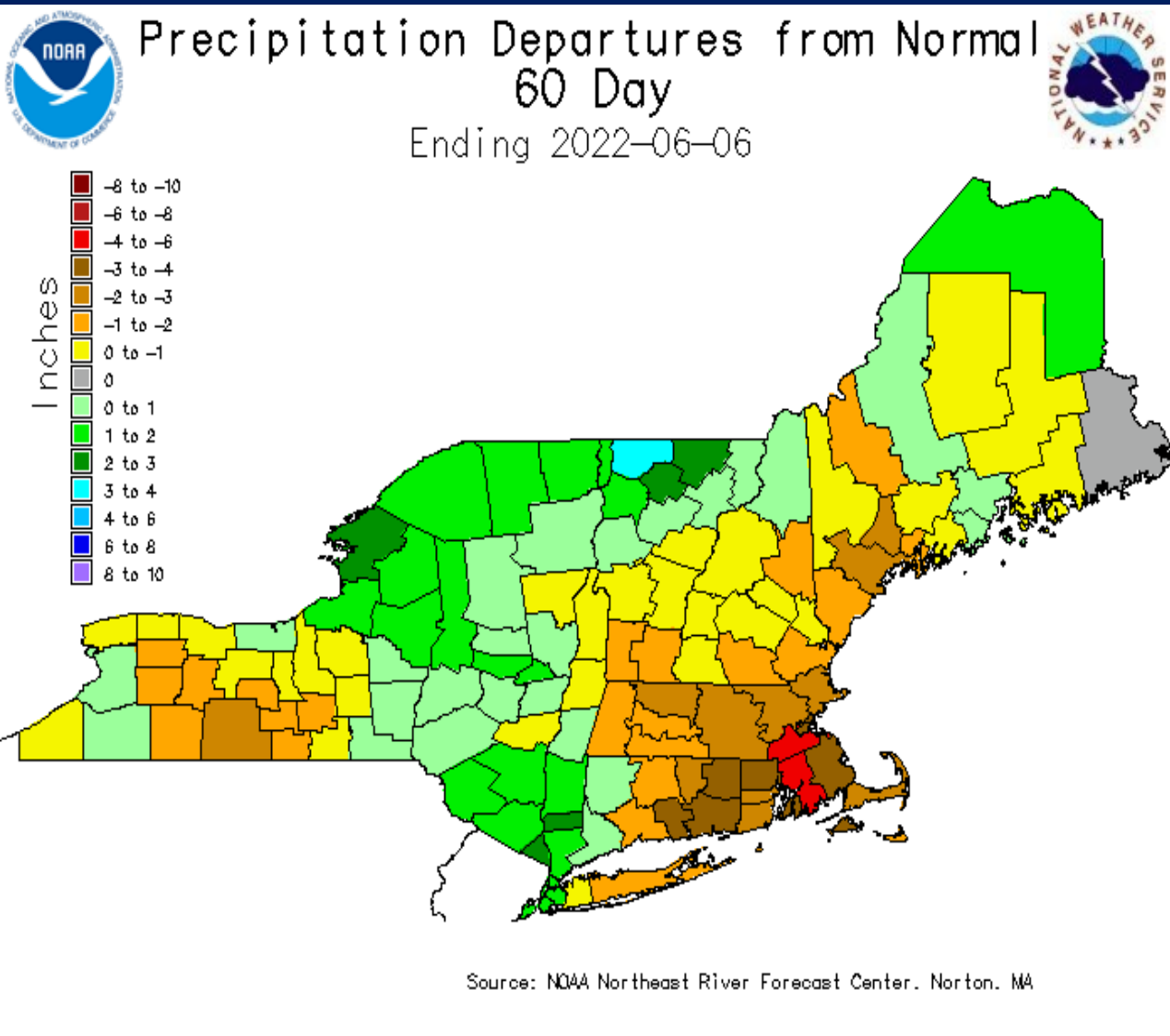
- Massachusetts Rainfall Departures – Spring 2022
- Current River Flows / Groundwater
- River Forecast Outlook
- Conclusions

MASS RAINFALL DEPARTURES – SPRING 2022

- All of the Commonwealth received below normal rainfall during Spring 2022 (Mar...Apr and May).
Boston -4.48"
Worcester -2.04"
- The highest negative departures occurred in eastern sections of Massachusetts (Cape Cod fared marginally better).

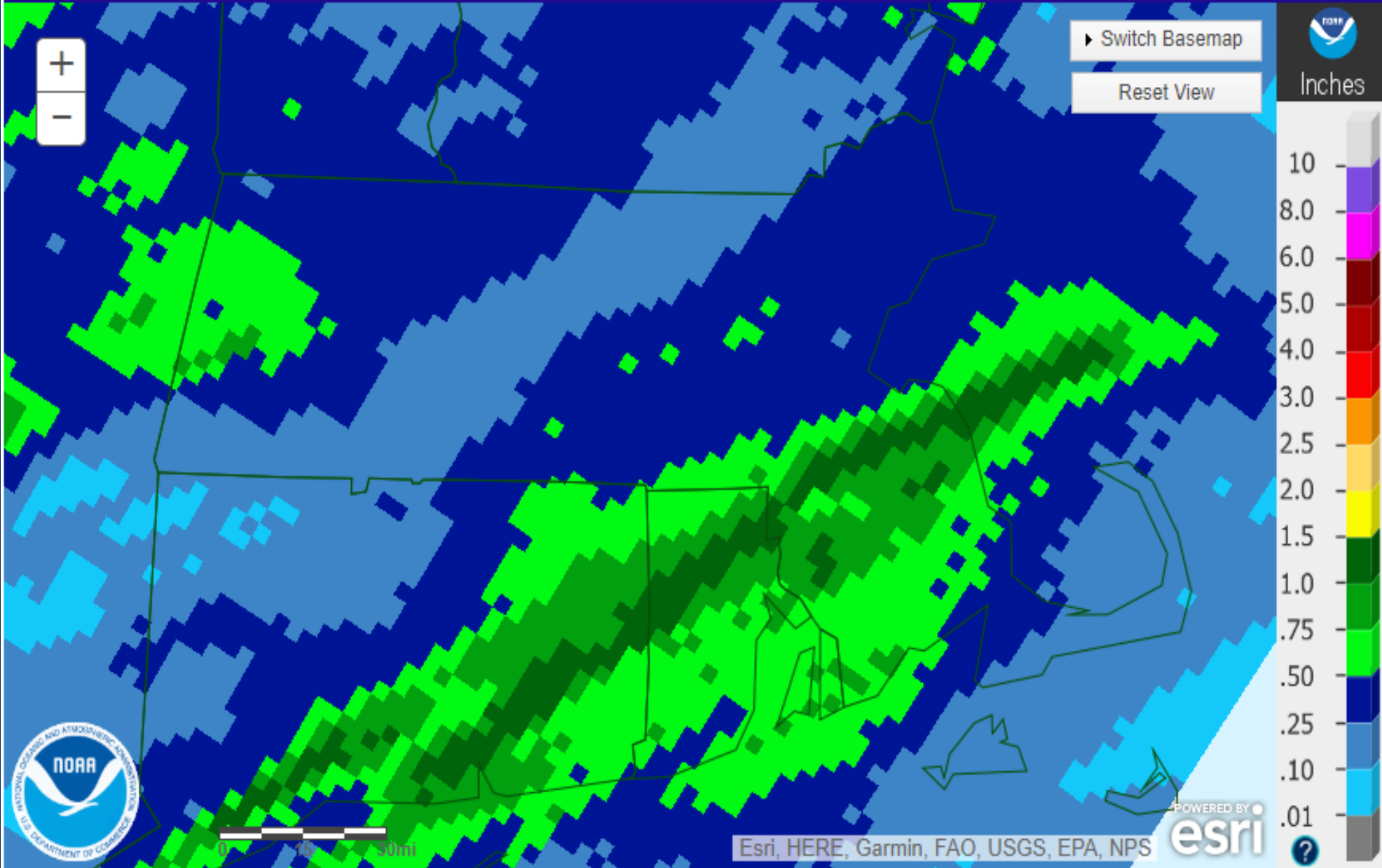


MASS RAINFALL DEPARTURES – SPRING 2022



What is UTC time? Map Help

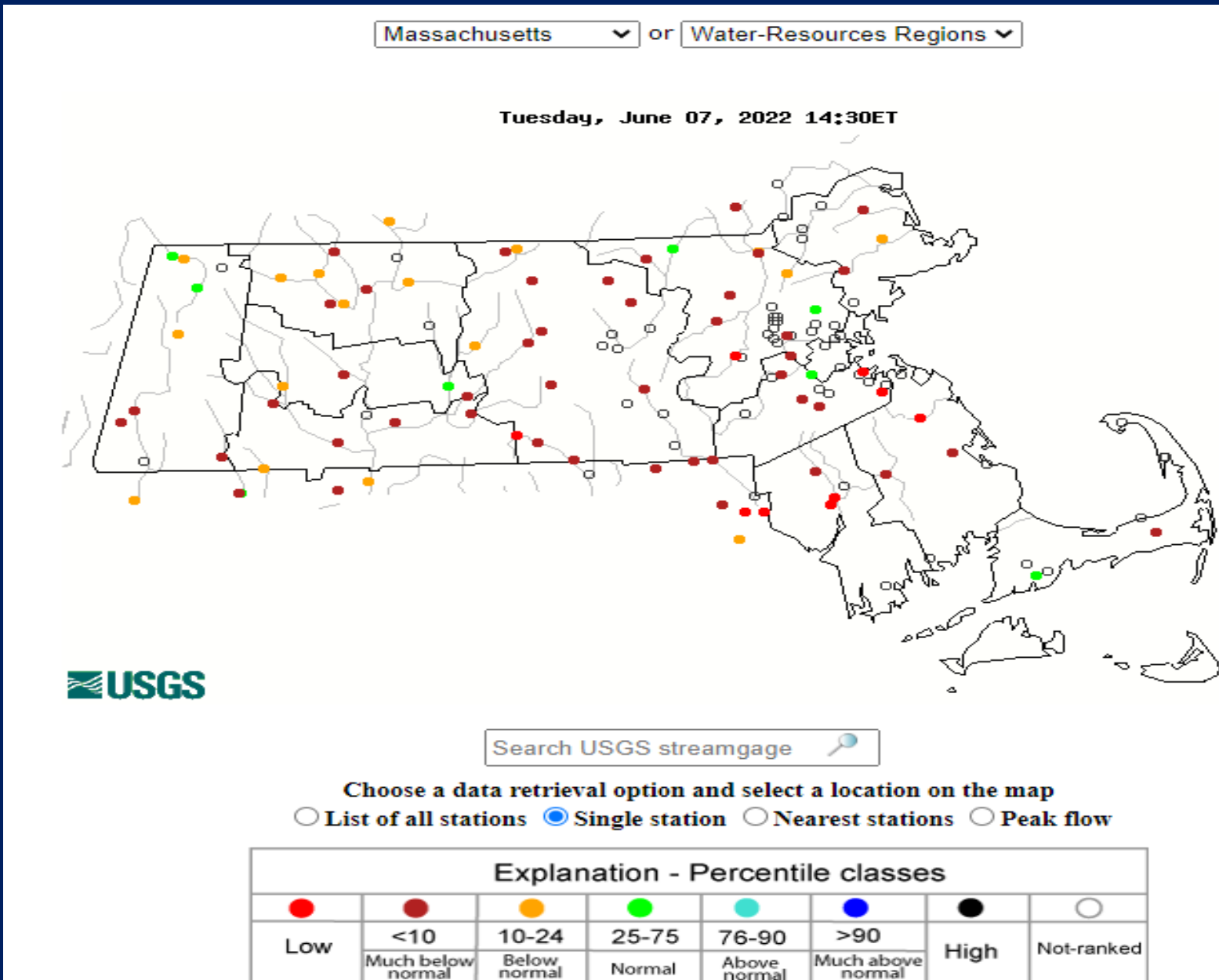
Find address or location



- 24-hour rainfall ending 8AM EDT 8 June

CURRENT RIVER FLOWS

- Flows were below to much below normal across the State as of 7 June 2022.
- Several record low daily flows (bright red circles) were observed across southeast Massachusetts where the drought is emerging most rapidly.

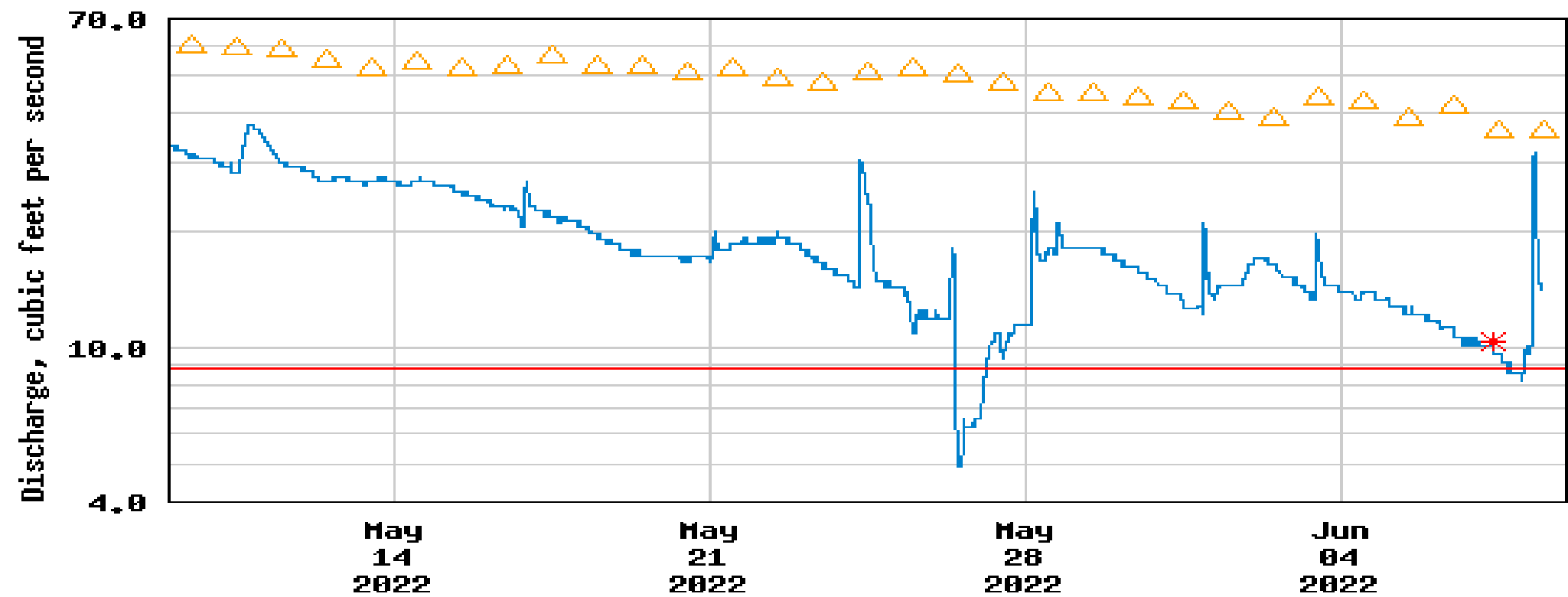


CURRENT RIVER FLOWS - cont

Discharge, cubic feet per second

Most recent instantaneous value: 14.6 06-08-2022 11:00 EDT

USGS 01105000 NEPONSET RIVER AT NORWOOD, MA

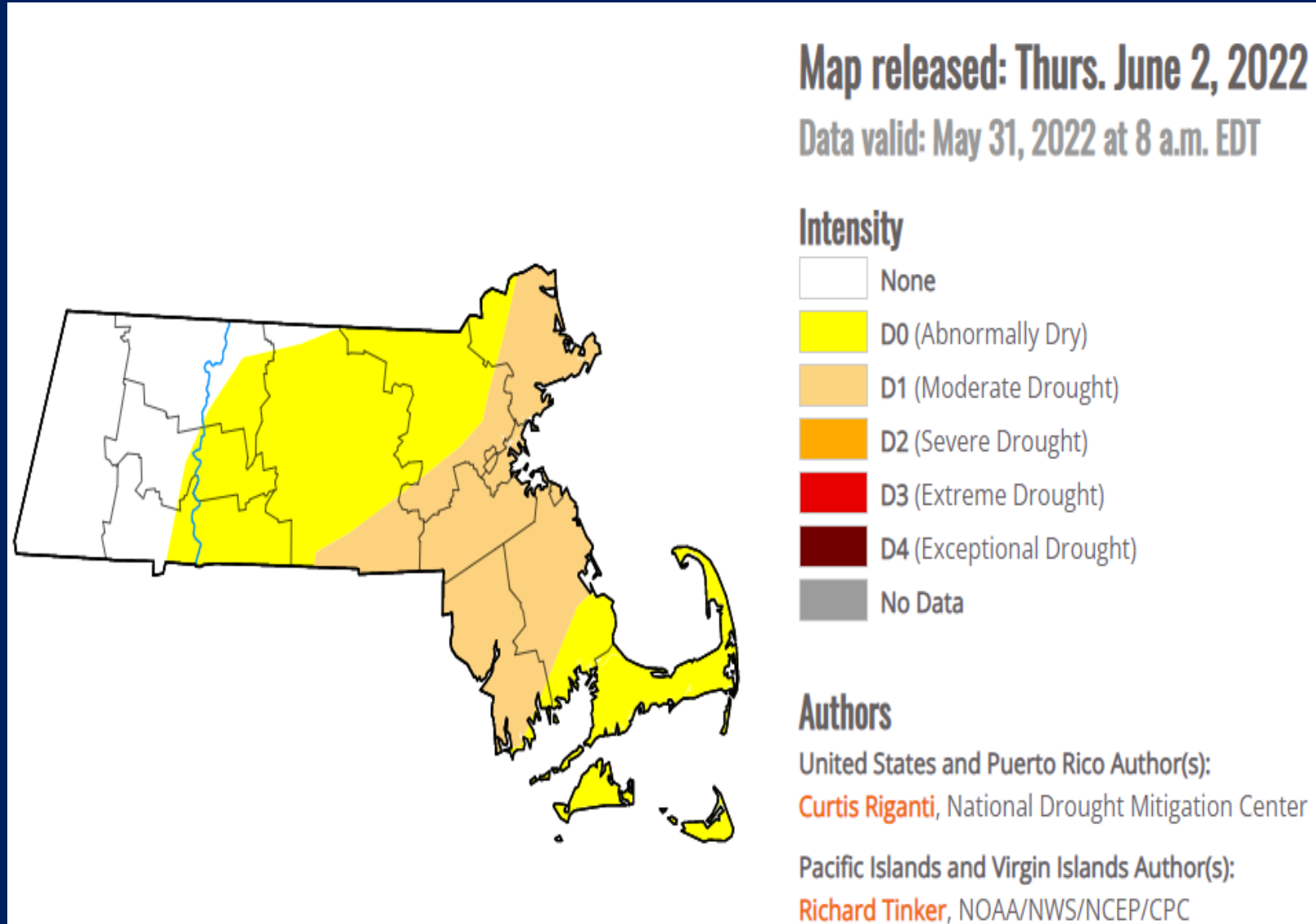


---- Provisional Data Subject to Revision ----

- △ Median daily statistic (82 years)
- ★ Measured discharge
- Discharge
- 90-percent Flow Duration

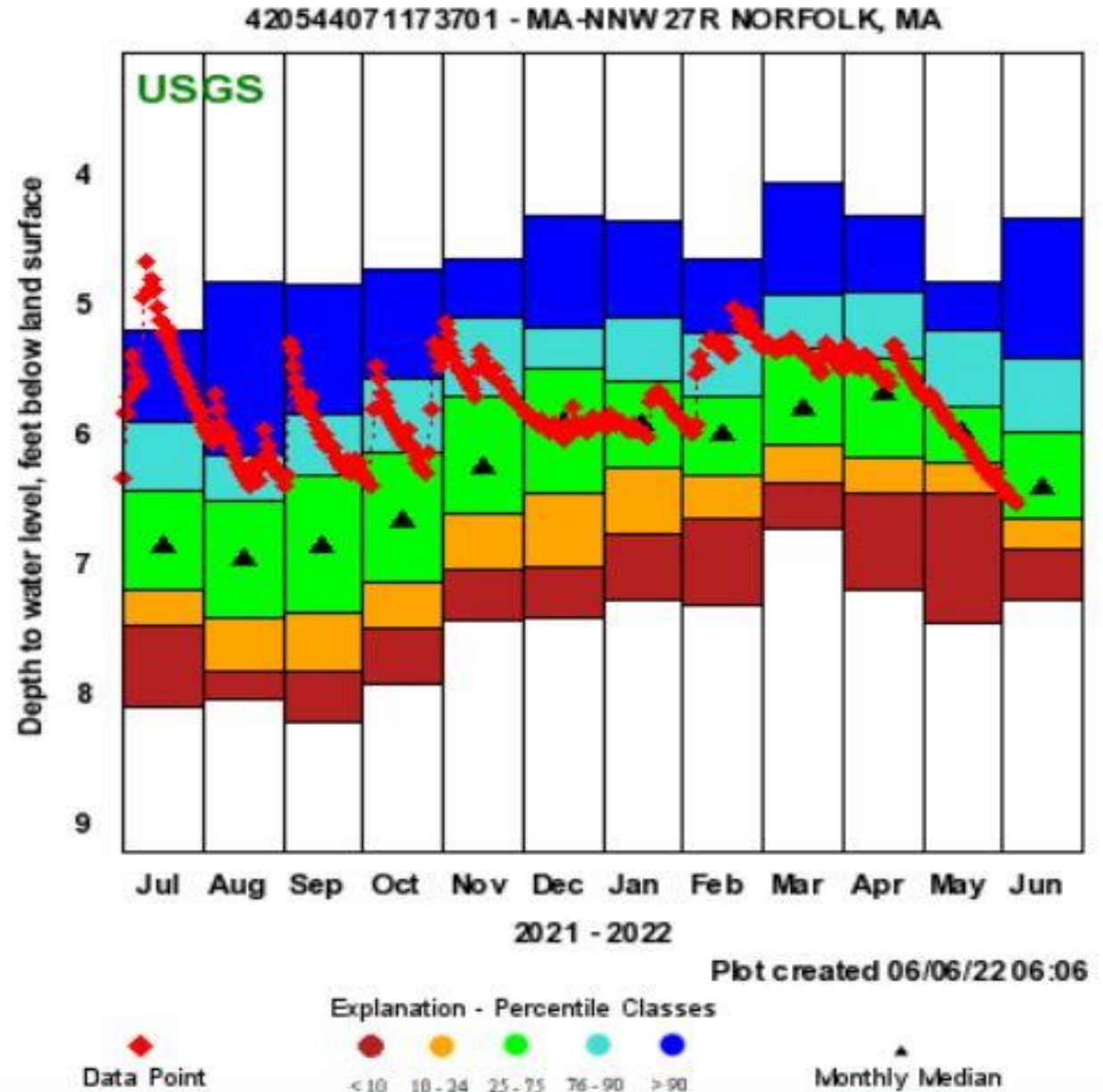
CURRENT RIVER FLOWS - cont

- Current USDM D1 corresponds nicely to the areas with record low daily flows.



GROUNDWATER

- Groundwater levels across the Commonwealth are in much better shape than surface flows. Even the shallow wells in the current drought areas are holding near normal although beginning to decline.



NAEFS ENSEMBLE RIVER FORECAST OUTLOOK

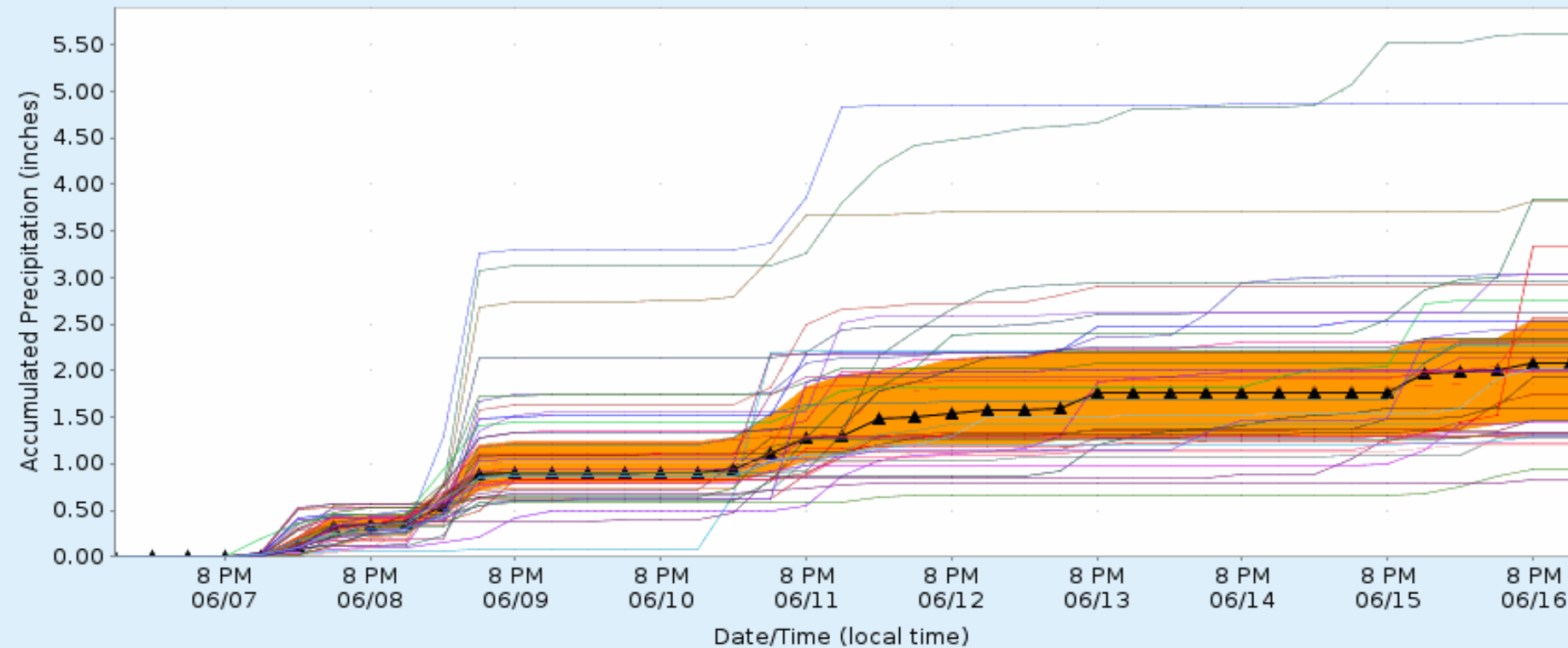
- A 42 member ensemble run for all NERFC forecast points to give us an idea of the possible range of river flows.
 - Basically 42 slightly different initial conditions lead to 42 different forecasts based on rainfall and temperature.
- Will show results for the Neponset River at Norwood (NRWM3) and the Westfield River at Westfield (WSFM3).

NAEFS – NRW3



10 Day NAEFS Accumulated Precipitation Simulations Used as Input to the River Level Simulations

Neponset River at Norwood, MA (NRWM3)



Rainfall forecasts are clustered in the 1.00 – 2.00 inch range over the next 10 days.

A few outlier solutions suggest 4+ inches of rainfall.

- Individual Model Simulations (42 Total)
- ▲ Median Precipitation (Simulations indicate a 50% Chance of Exceeding this Rainfall Amount)
- More Likely Range (Simulations indicate a 40% chance precipitation amounts will fall within this range)

NAEFS – NRW3

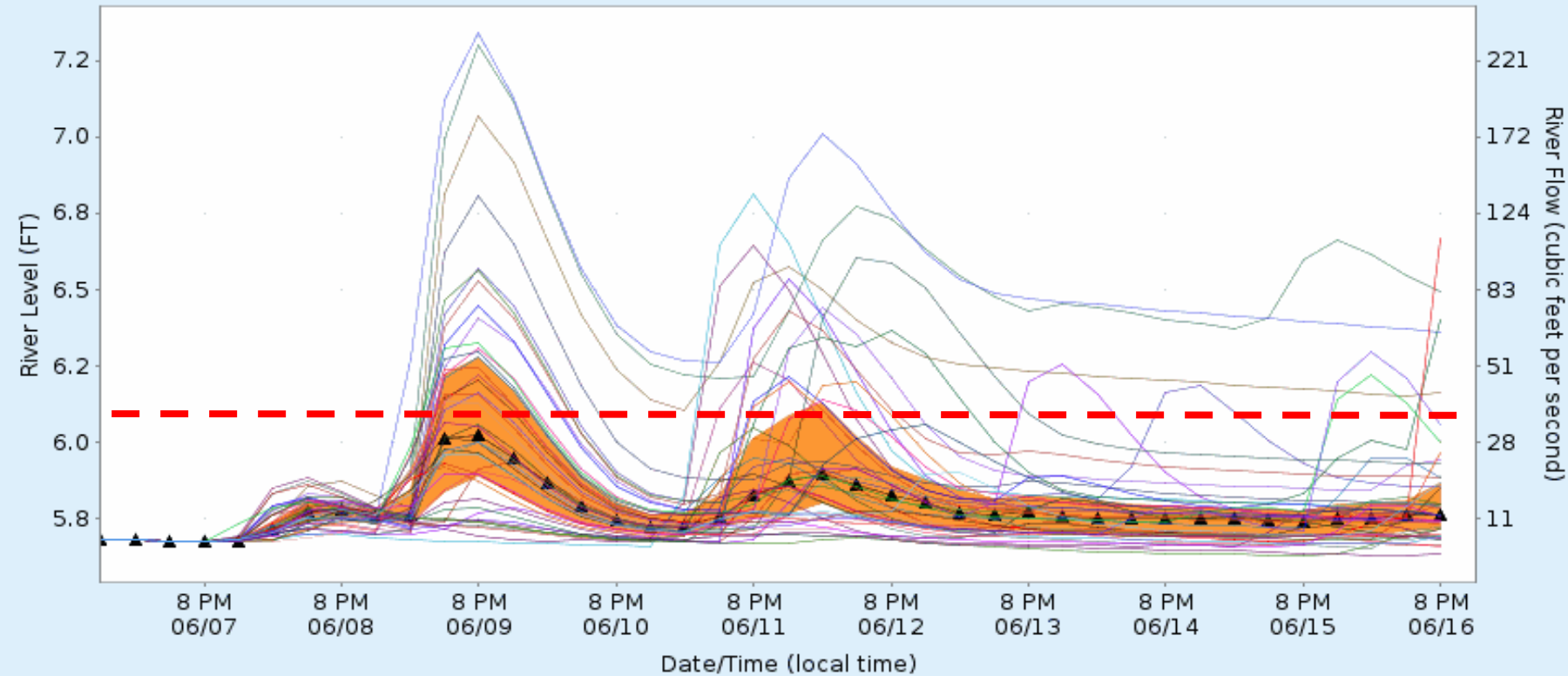


7 Day NAEFS River Level Simulations

Used to Estimate the Chance of Flooding and the Range of Possible River Levels
Each Line Shows an Individual Model Simulation (42 Total)



Neponset River at Norwood, MA (NRWM3)



- Individual Model Simulations (42 Total)
- ▲ Median River Level (Simulations indicate a 50% Chance of Exceeding this Level)
- More Likely Range (Simulations indicate a 40% chance river levels will fall within this range)

Most all solutions suggest river flows will be higher in 10 days than they were entering this week but below the median flow for early June.

NAEFS – WSFM3

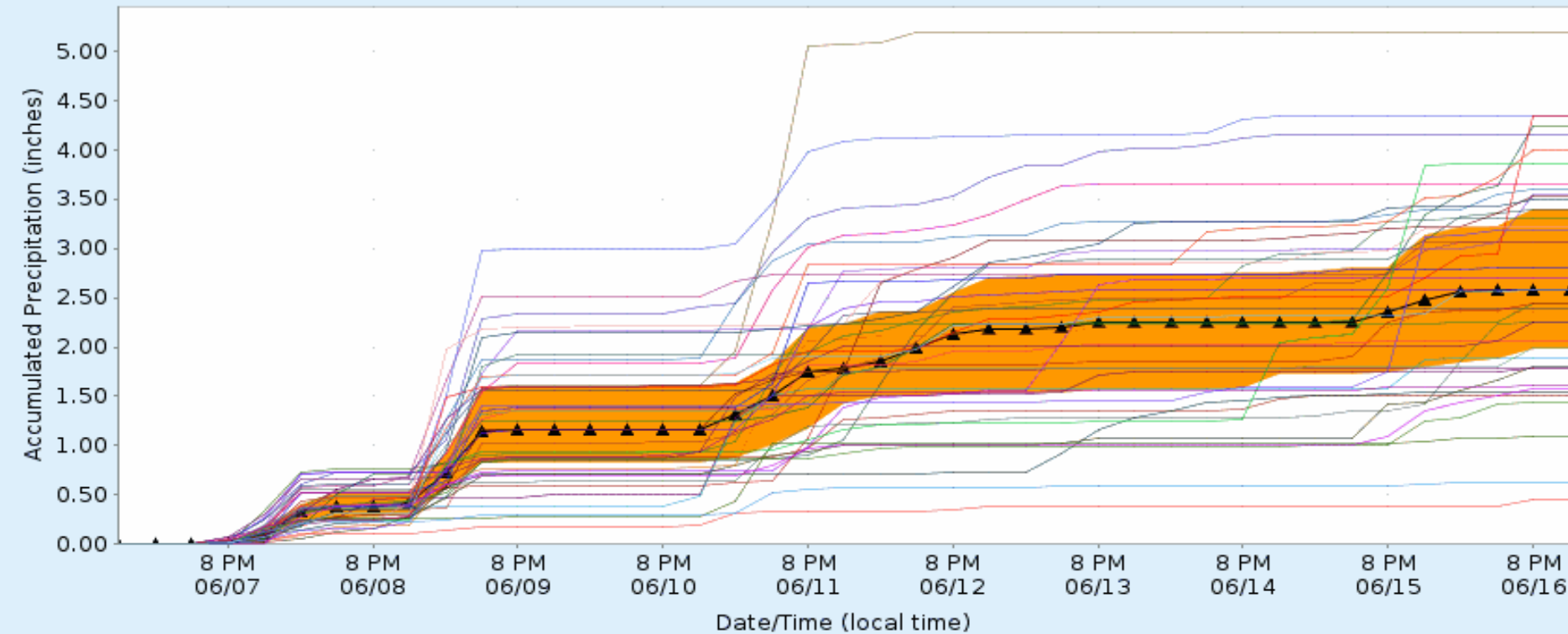


10 Day NAEFS Accumulated Precipitation Simulations

Used as Input to the River Level Simulations



Westfield River at Westfield, MA (WSFM3)



- Individual Model Simulations (42 Total)
- ▲ Median Precipitation (Simulations indicate a 50% Chance of Exceeding this Rainfall Amount)
- More Likely Range (Simulations indicate a 40% chance precipitation amounts will fall within this range)

Rainfall is projected to be a bit higher here...between 1.50 and 3.00 inches.

There is more uncertainty with less clustering around the median.

NAEFS – WSFM3

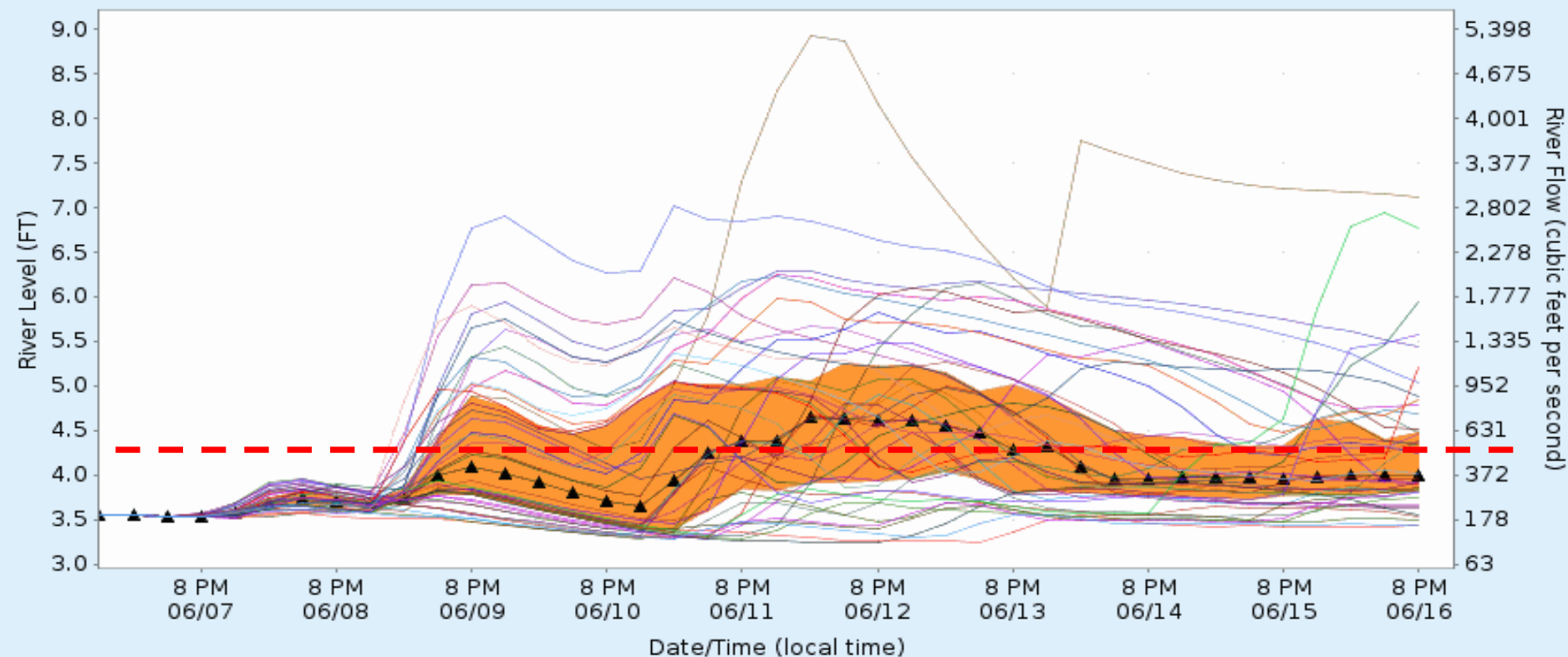


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Westfield River at Westfield, MA (WSFM3)



- Individual Model Simulations (42 Total)
- ▲ Median River Level (Simulations indicate a 50% Chance of Exceeding this Level)
- More Likely Range (Simulations indicate a 40% chance river levels will fall within this range)

- Flows in 10 days are likely to be closer to the median compared to Norwood.

CONCLUSIONS

- Most rivers and streams should see flow increases over the next 10 days due to the expected wet weather pattern.
- Groundwater is holding on despite the recent dryness.
- Eastern Massachusetts continues to be at the highest risk for drought expansion as we are entering the hottest part of the year with significant precipitation deficits.
- No excessive heat is indicated over the next 10 days.

[weather.gov/nerfc](https://www.weather.gov/nerfc)