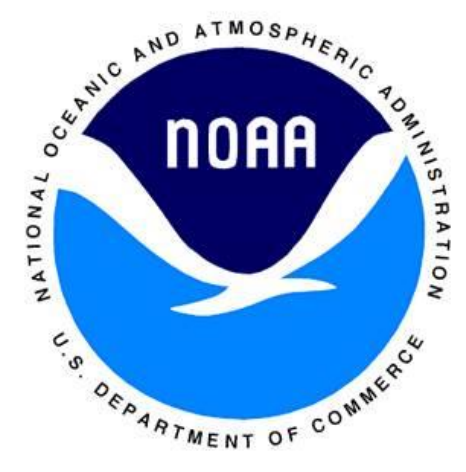


MASSACHUSETTS RIVER OVERVIEW



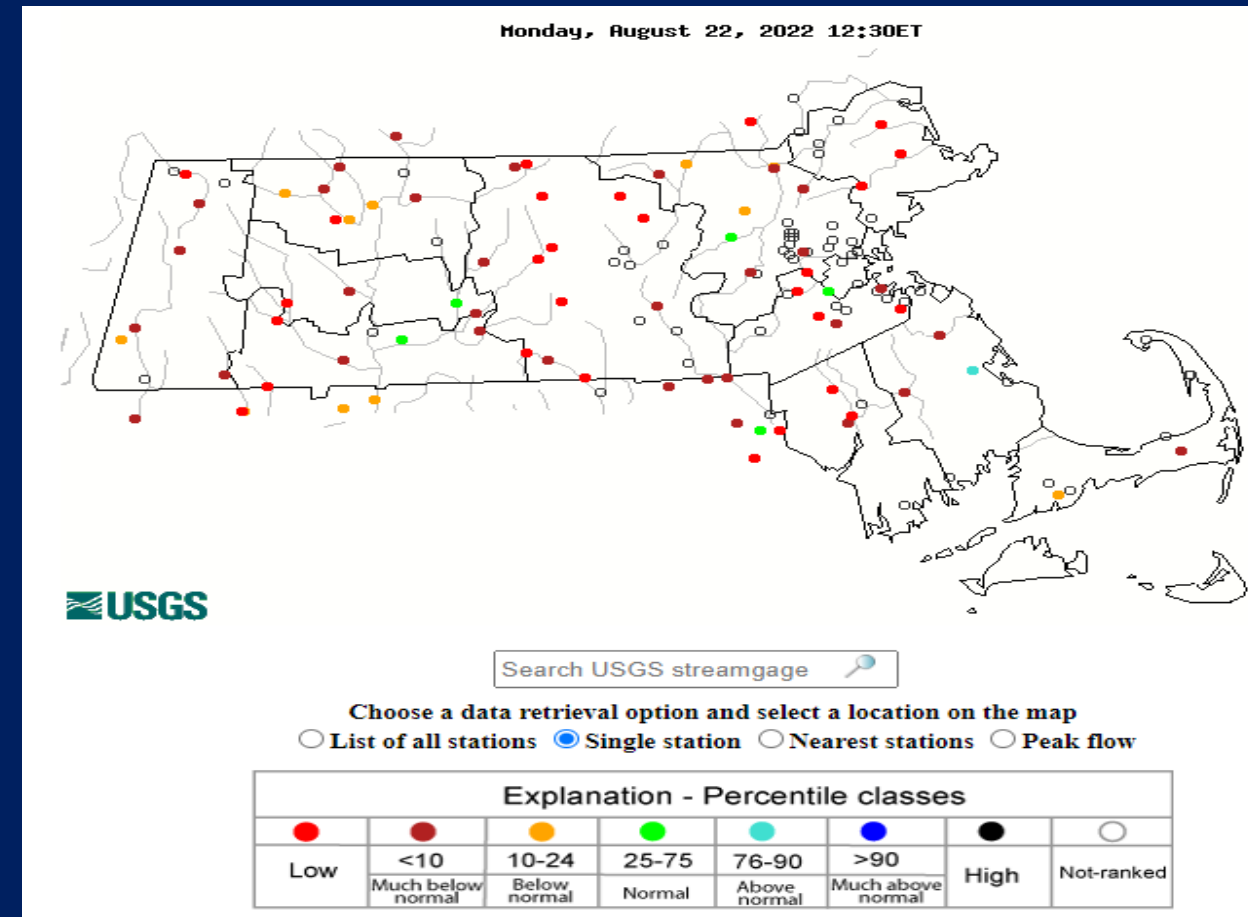
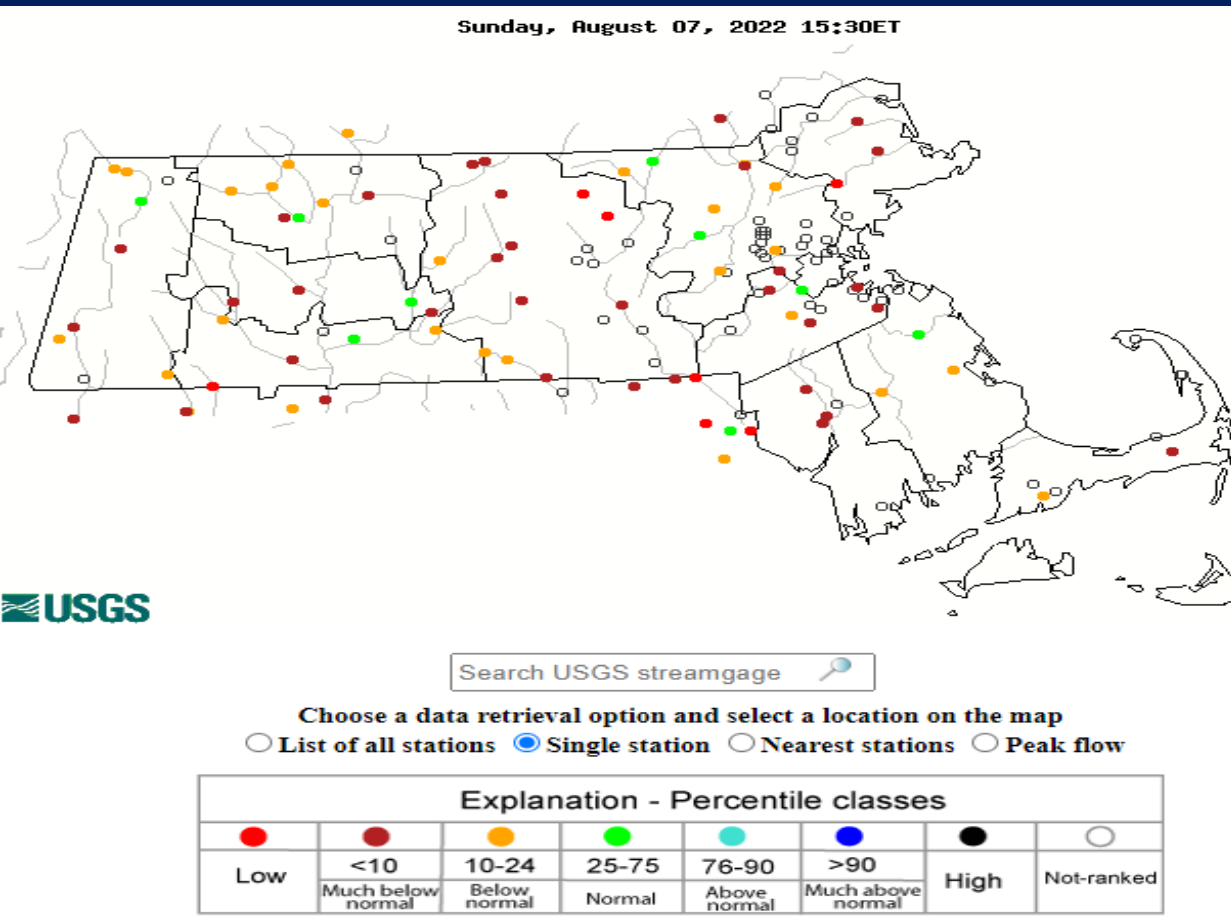
East Branch Neponset River
Canton MA
9 August 2022

Ronald S.W. Horwood
Sr. Meteorologist
NWS / NERFC
MA Drought Management
Task Force
23 August 2022

OUTLINE

- Snapshot of Massachusetts River Flows
- Comments on Previous NERFC Forecast Outlook
- NERFC River Forecast Outlook
- Takeaways

MASSACHUSETTS RIVER FLOWS

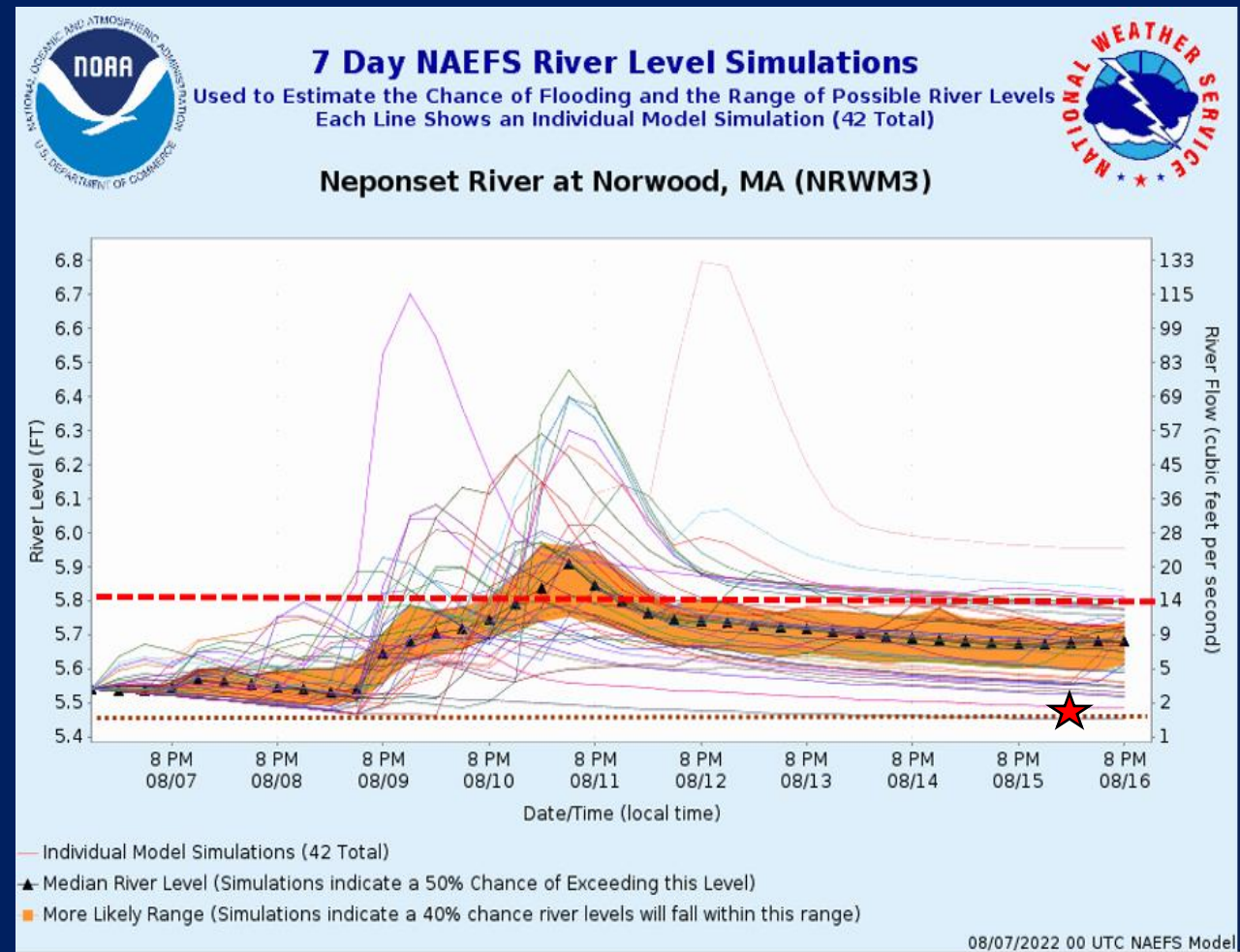
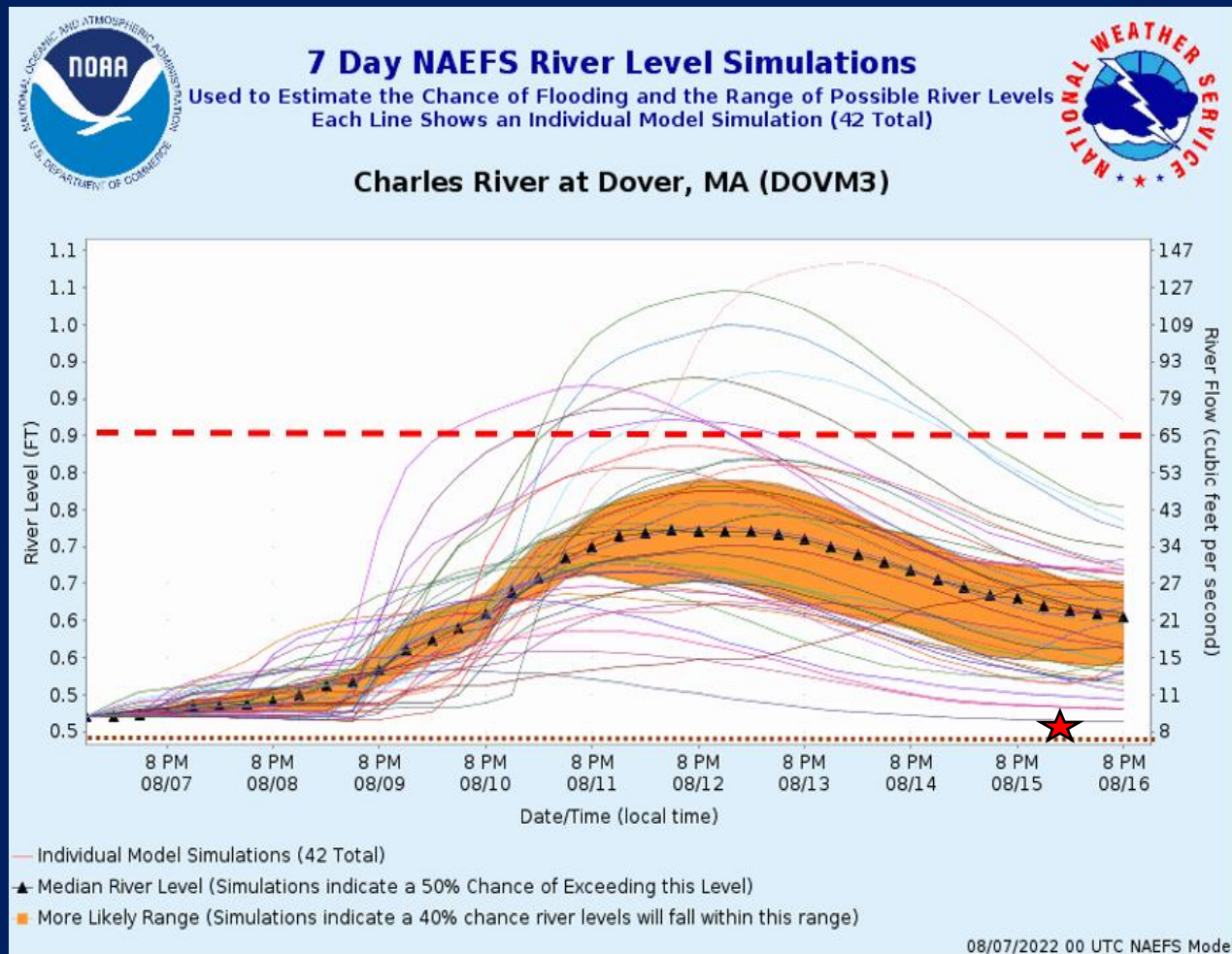


Almost all areas in the Commonwealth have seen intensifying drought and degrading river and stream flows since our last meeting. Worcester...Essex...Norfolk and Bristol counties look especially poor.

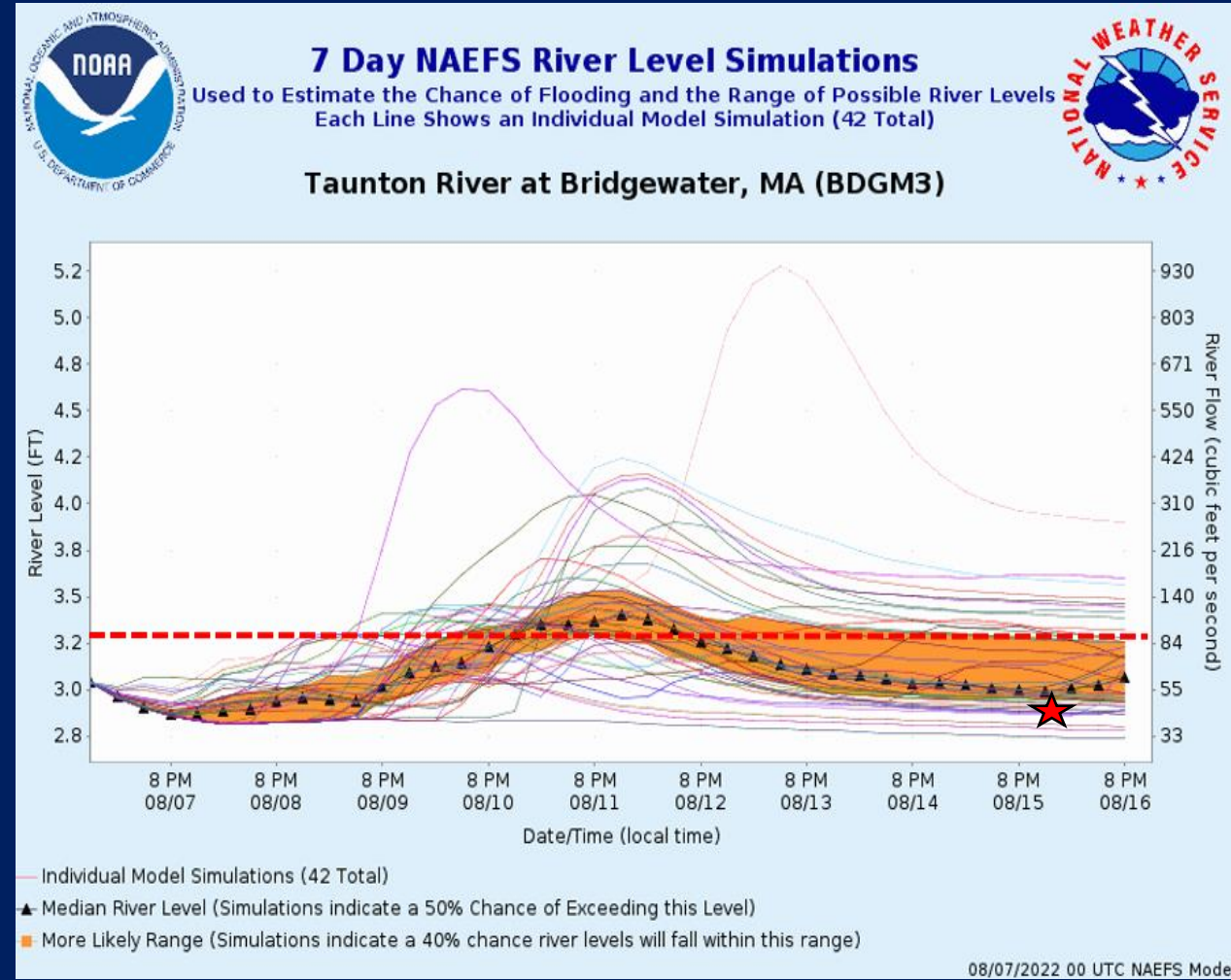
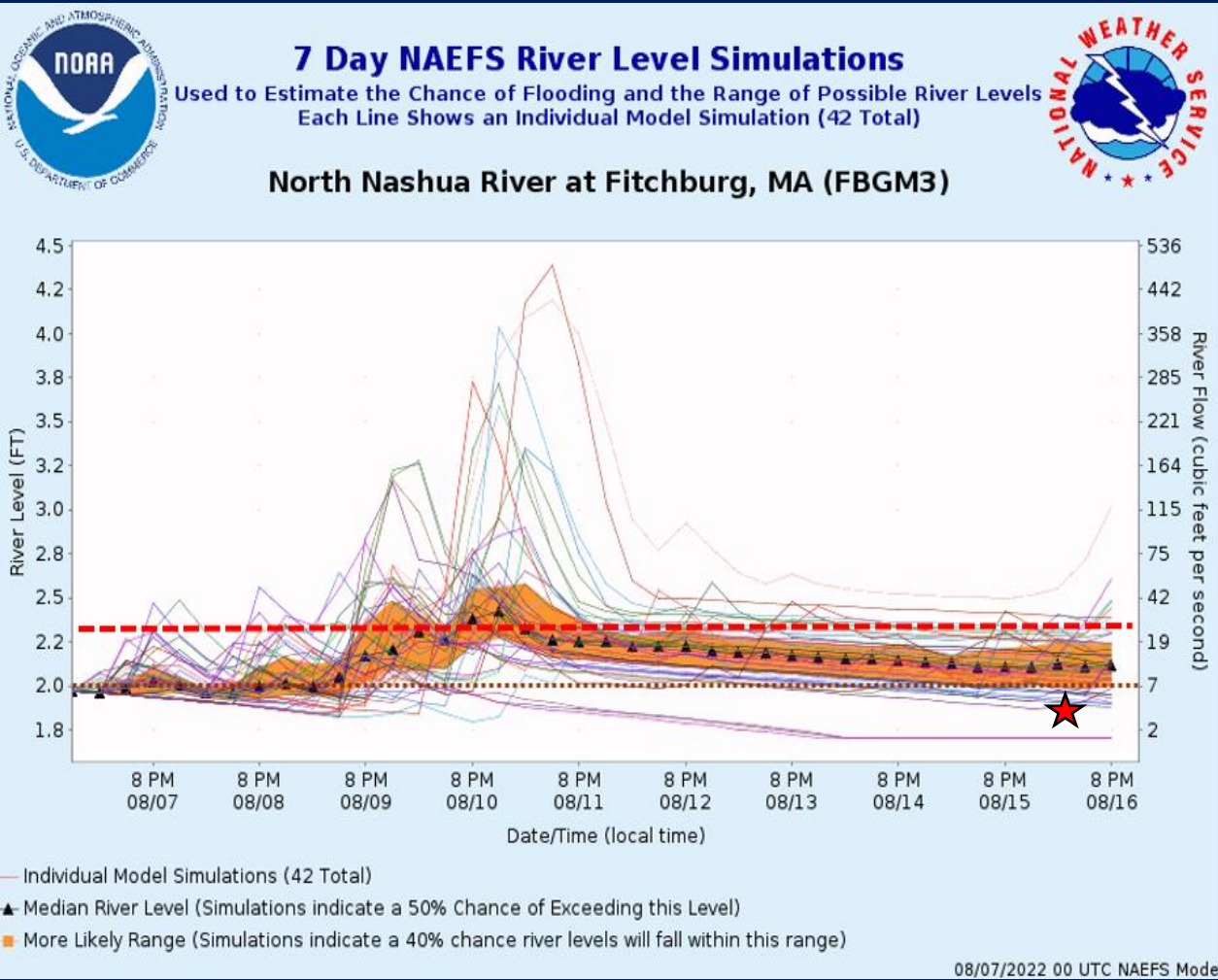
COMMENTS ON PREVIOUS OUTLOOK

- During our last meeting...the NERFC ensemble river forecasts suggested widespread improvement. Out of the 42 member ensemble...the rainfall totals were amongst the lowest of the members.
 - Intense drought is on the far end of the bell curve and forecasts can become difficult.
- Lets take a quick look at how bad the predictions were.

COMMENTS ON PREVIOUS OUTLOOK - cont

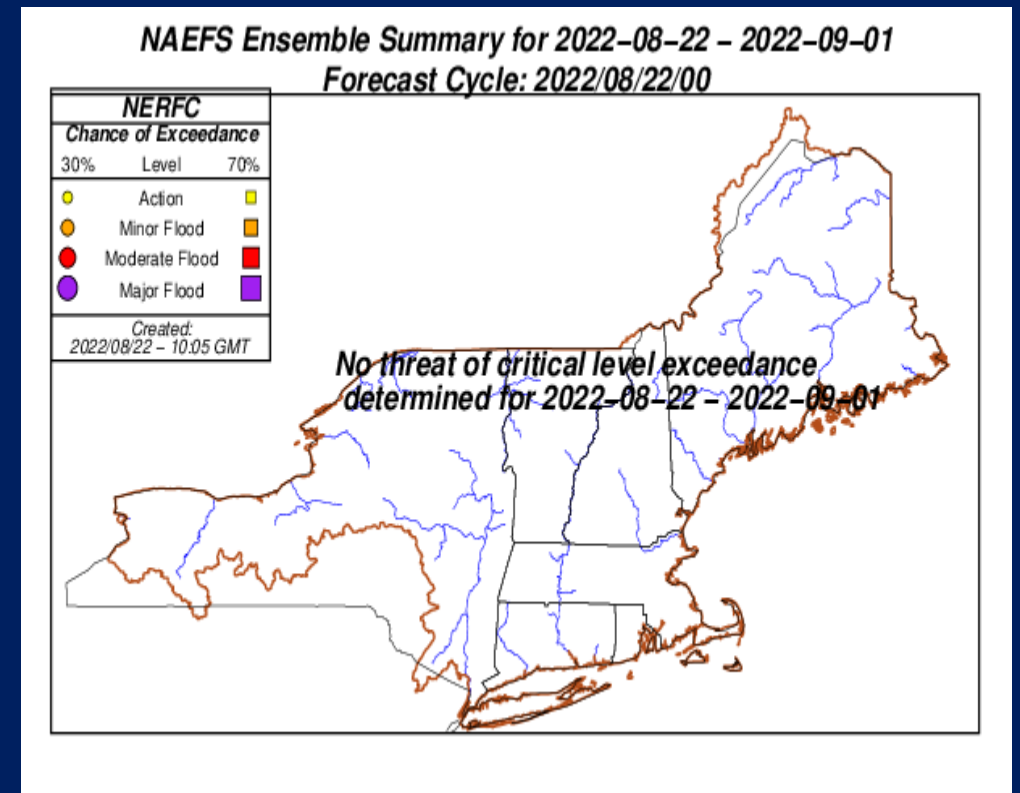


COMMENTS ON PREVIOUS OUTLOOK - cont



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 out 10 days.
 - Basically 42 slightly different initial conditions in the weather models lead to 42 different river forecasts based on rainfall and temperature.
- Will show results for...
 - Charles River at Dover (DOVM3)
 - Neponset River at Norwood (NRWM3)
 - North Nashua River at Fitchburg (FBGM3)
 - Taunton River near Bridgewater (BDGM3)



NAEFS PCPN – DOVM3

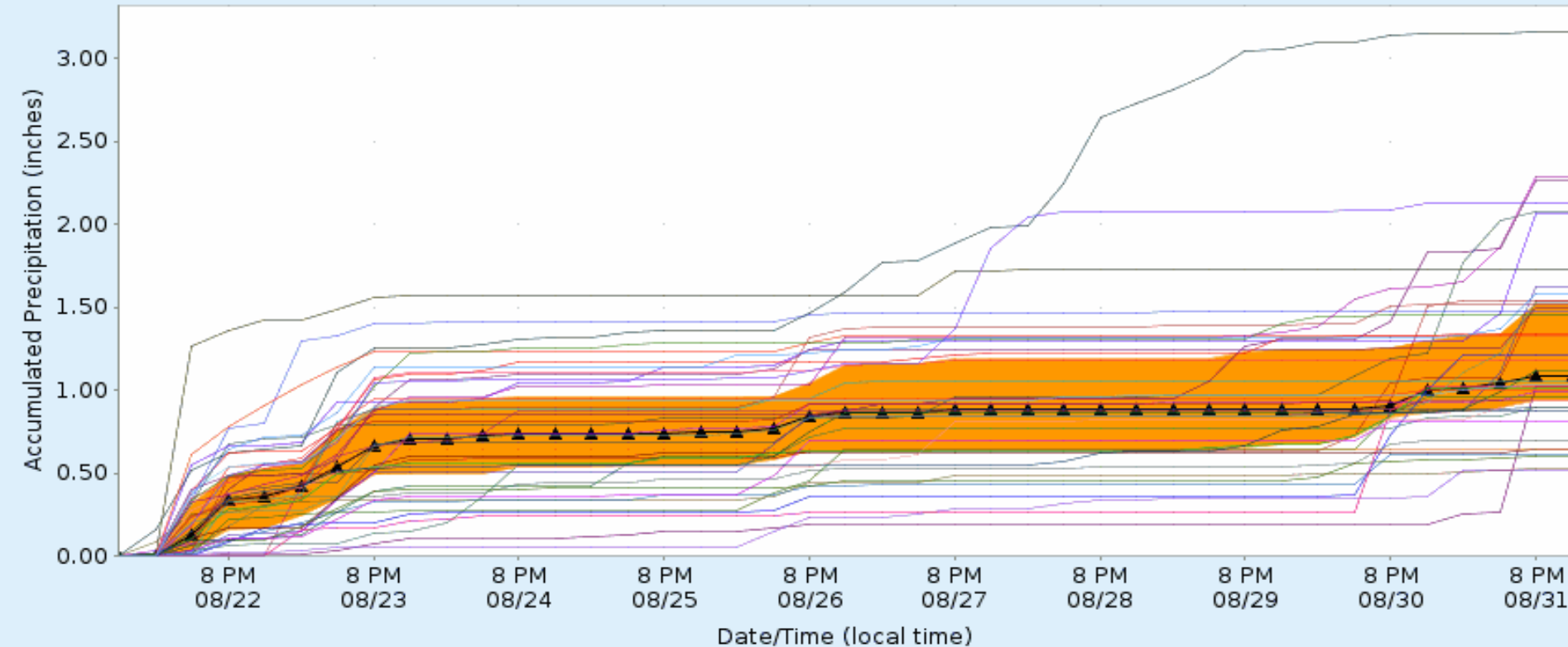


10 Day NAEFS Accumulated Precipitation Simulations

Used as Input to the River Level Simulations



Charles River at Dover, MA (DOVM3)



- 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)

Outside of what falls yesterday and today... the prospect for significant rainfall is not expected to be high.

Basically near or under 0.25 inches from 24-31 August.

NAEFS – DOVM3

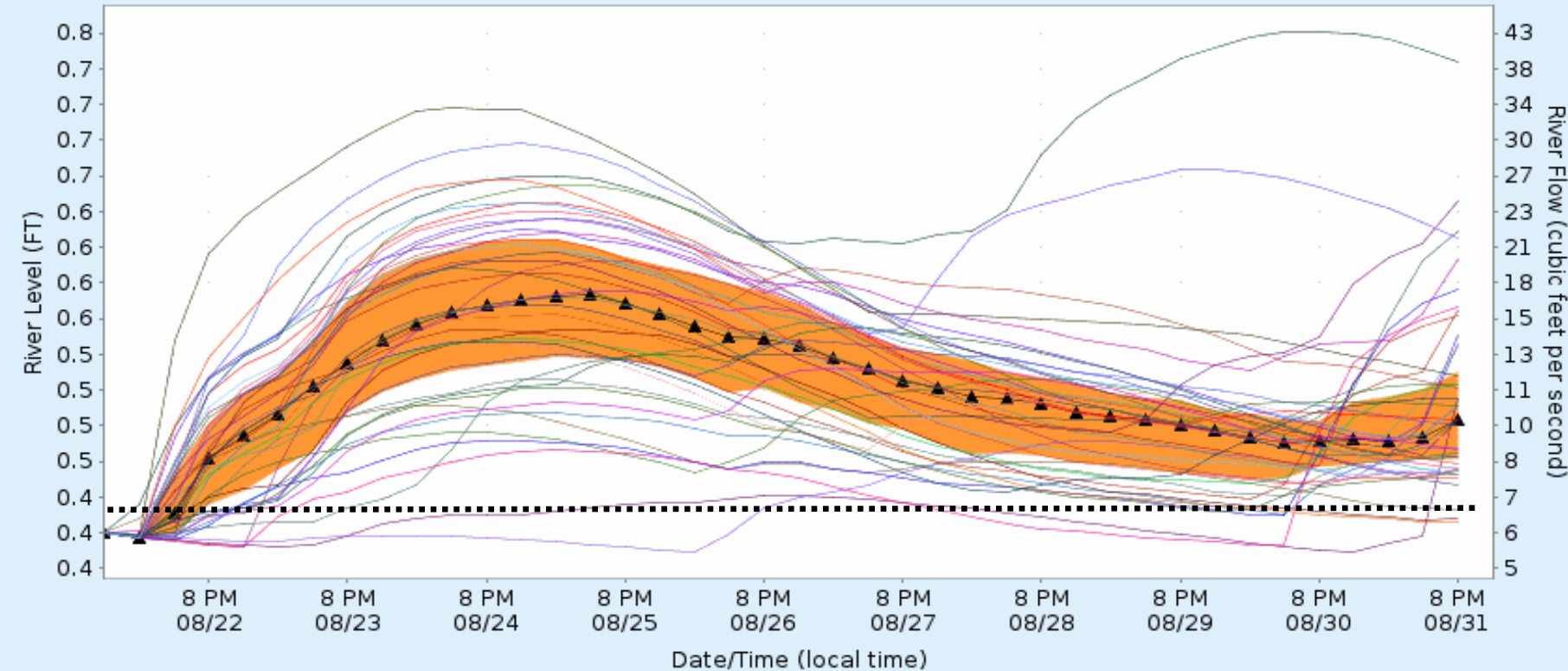


7 Day NAEFS River Level Simulations

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



Charles River at Dover, MA (DOVM3)



- 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)

As of yesterday...the Charles at Dover was at a record daily low flow with 84 years of record. Only “slight” recovery is forecast.

The median flow for this time of the year is around 61 cubic feet per second (CFS) which is off the high end of the chart.

NAEFS – NRW3

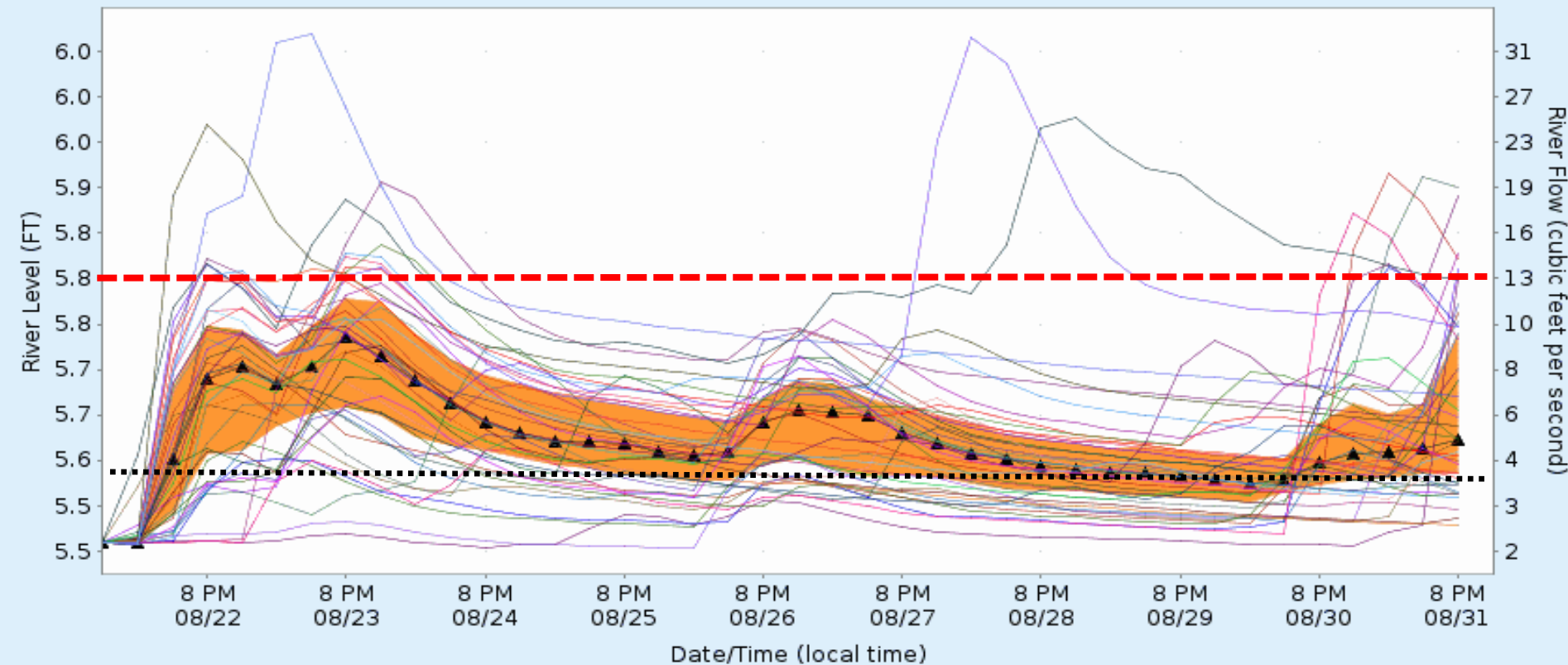


7 Day NAEFS River Level Simulations

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)

Again...we see record low daily flows as of yesterday at Norwood with 82 years of record.

After yesterdays rain...we will likely recede to near record low levels again by the upcoming weekend.

NAEFS – FBGM3

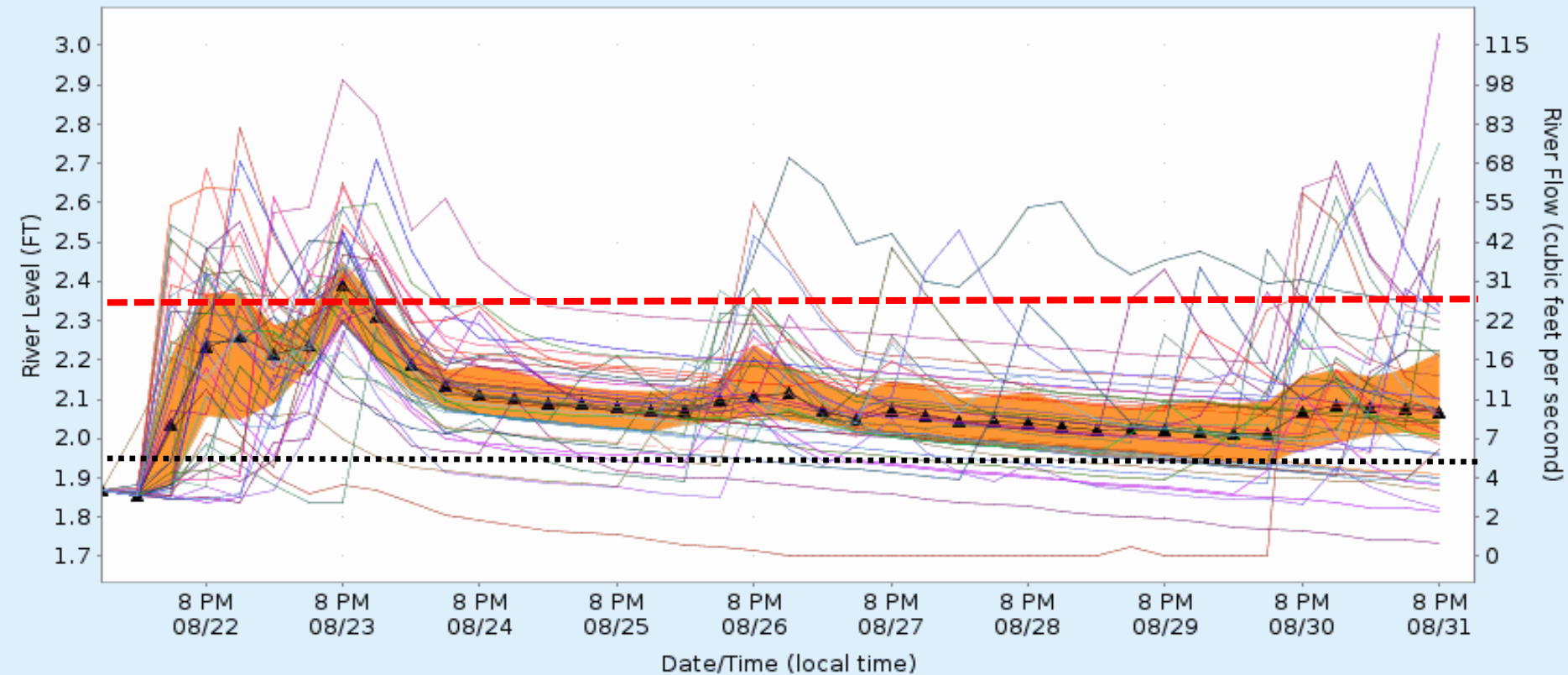


7 Day NAEFS River Level Simulations

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



North Nashua River at Fitchburg, MA (FBGM3)



- 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)

- The North Nashua River at Fitchburg was also at record low daily levels on 21 August with a 49 year period of record.
- After yesterday's runoff...flows will likely fall to near or just above record low levels yet again.

NAEFS – BDGM3

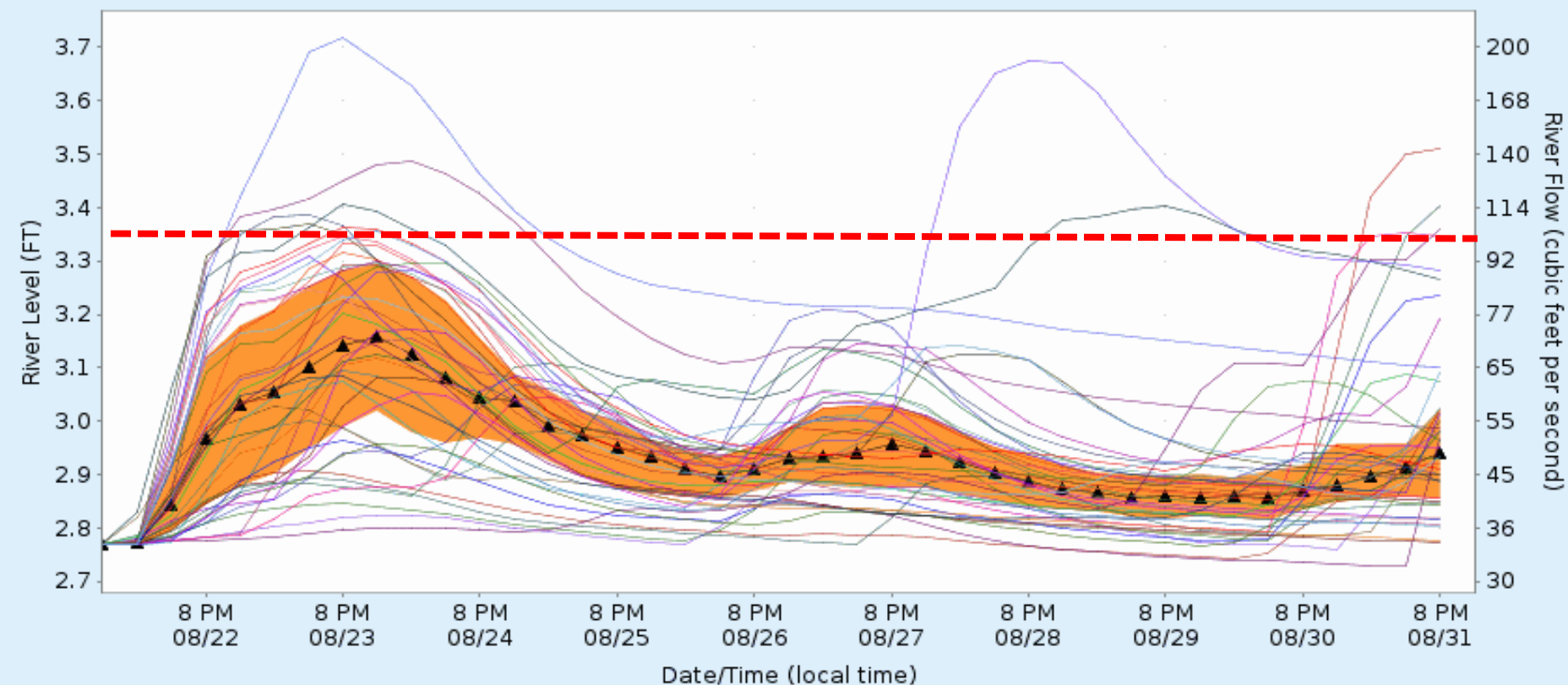


7 Day NAEFS River Level Simulations

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



Taunton River at Bridgewater, MA (BDGM3)



- 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 will likely remain below the median for August but are a fair ways above the record low flows for the date which are around 12 CFS.
- Plymouth County has seen a bit more rain than most other areas in the state over the past 3 weeks.

TAKEAWAYS

- River flows have degraded across the Commonwealth since our last meeting on 8 August 2022.
 - Worcester...Essex...Bristol and Norfolk counties are in particularly bad shape.
- Many rivers and streams were at record low daily flow levels as of yesterday morning (22 August).
- After yesterday's and today's rainfall...the prospect for significant rainfall is not great over the next 10 days.
 - Localized rainfall amounts over 2 inches occurred in spots yesterday (extreme western portions of Cape Cod north to Plymouth County) while other areas saw little beneficial rainfall.
- NERFC ensemble river forecasts call for many Massachusetts rivers to see only slight improvements over the next 10 days with some rivers and streams likely returning to near or below record low daily flow levels.
 - Taunton River at Bridgewater will likely be one of the rivers to see more beneficial flow increases due to downpours yesterday.

weather.gov/nerfc