

INTRODUCTION

Significant spring flooding occurred on the Mississippi River in 2019, which set records for both the magnitude of the flooding and the length of time flooding occurred.

ISSUE #1: Partners needed to prepare for flooding in the time-scale *between* when the AHPS Probabilistic Outlooks were produced and when crests were included in the operational forecasts. The Spring Flood Probabilistic Outlook provides good information to prepare, but does not give enough confidence for many partners to take action, meaning prepping, and staging resources. When the ESF's were weeks old, partners began to question their validity and what they should realistically be preparing for in terms of both timing and crest heights.

ISSUE #2: The official forecast only included 24 hours of forecast rainfall through much of the event. In several instances the official hydrographs showed falling stream levels when there was high confidence on levels rising back to critical levels. There is currently no method to portray that on AHPS.

METHODS

WFO Quad Cities developed easy to read graphics using a quasi-ensemble approach to provide ranges in what to expect for future river levels and timing of river rises. These graphics showed what forecasters knew and were not able to provide in the official hydrographs and AHPS pages.

The North Central River Forecast Center did extra modeling to help in this effort which also used products already being created. The information used in the quasi-ensemble approach included forecasts using 5-day QPF, 7-day QPF, NAEFS 16 day QPF, 24-72 hour ensembles, and the AHPS Probabilistic Outlooks. CPC's experimental week 2 potential for extreme rainfall product was also used to gain confidence on the 'probabilistic' information being provided.

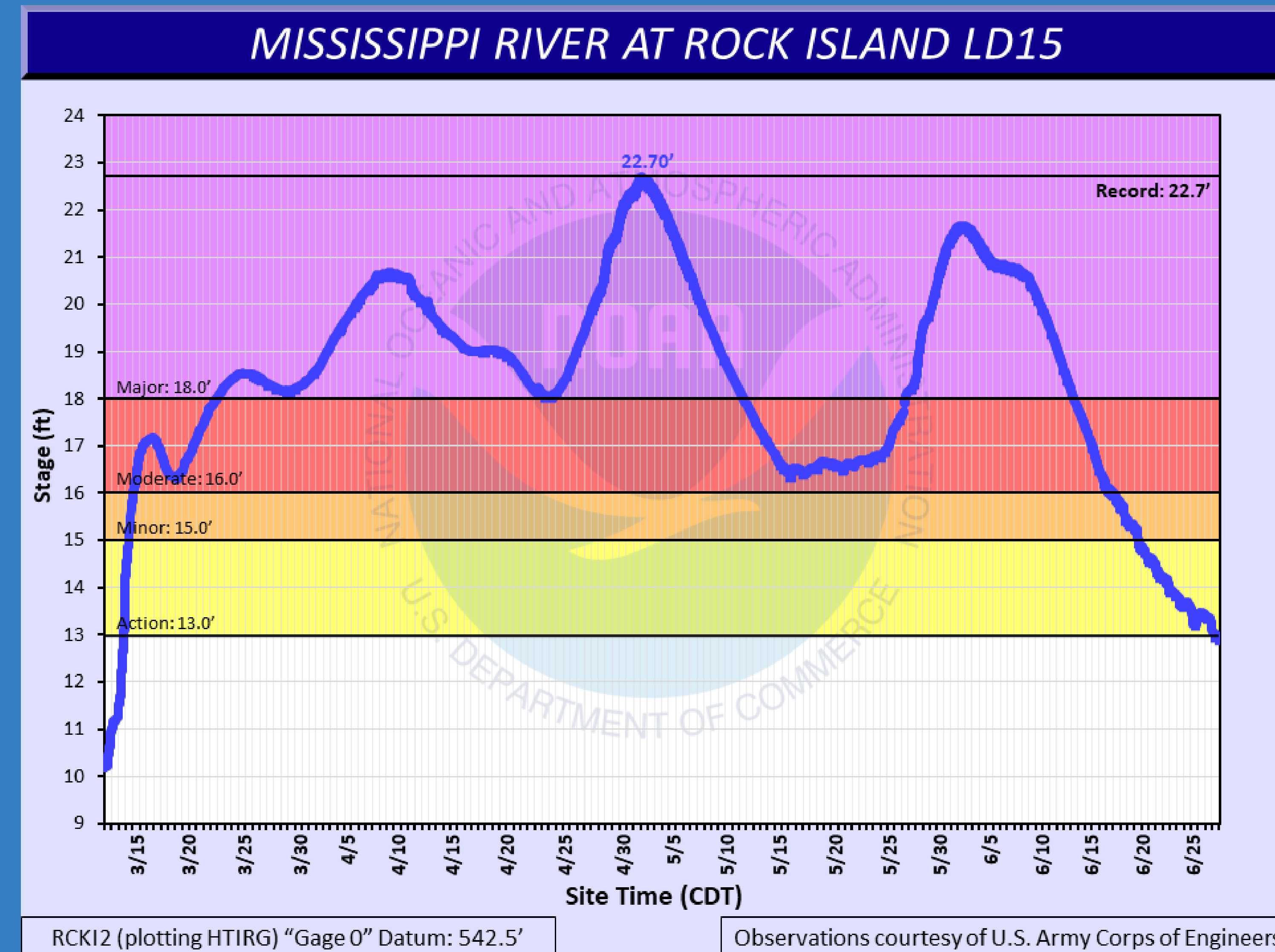
RESULTS

Partners expressed their appreciation for the extra efforts and information that was provided to them as it allowed them the time to plan, order resources, stage resources, and implement flood fighting efforts that they would not have had time to do if they waited until the rise started showing up in the official forecast.

DISCUSSION

The NWS needs to pursue the option to provide probabilistic river forecasts in time-scales closer than the 3 month statistics in order to provide the IDSS needed by our partners in river flood events.

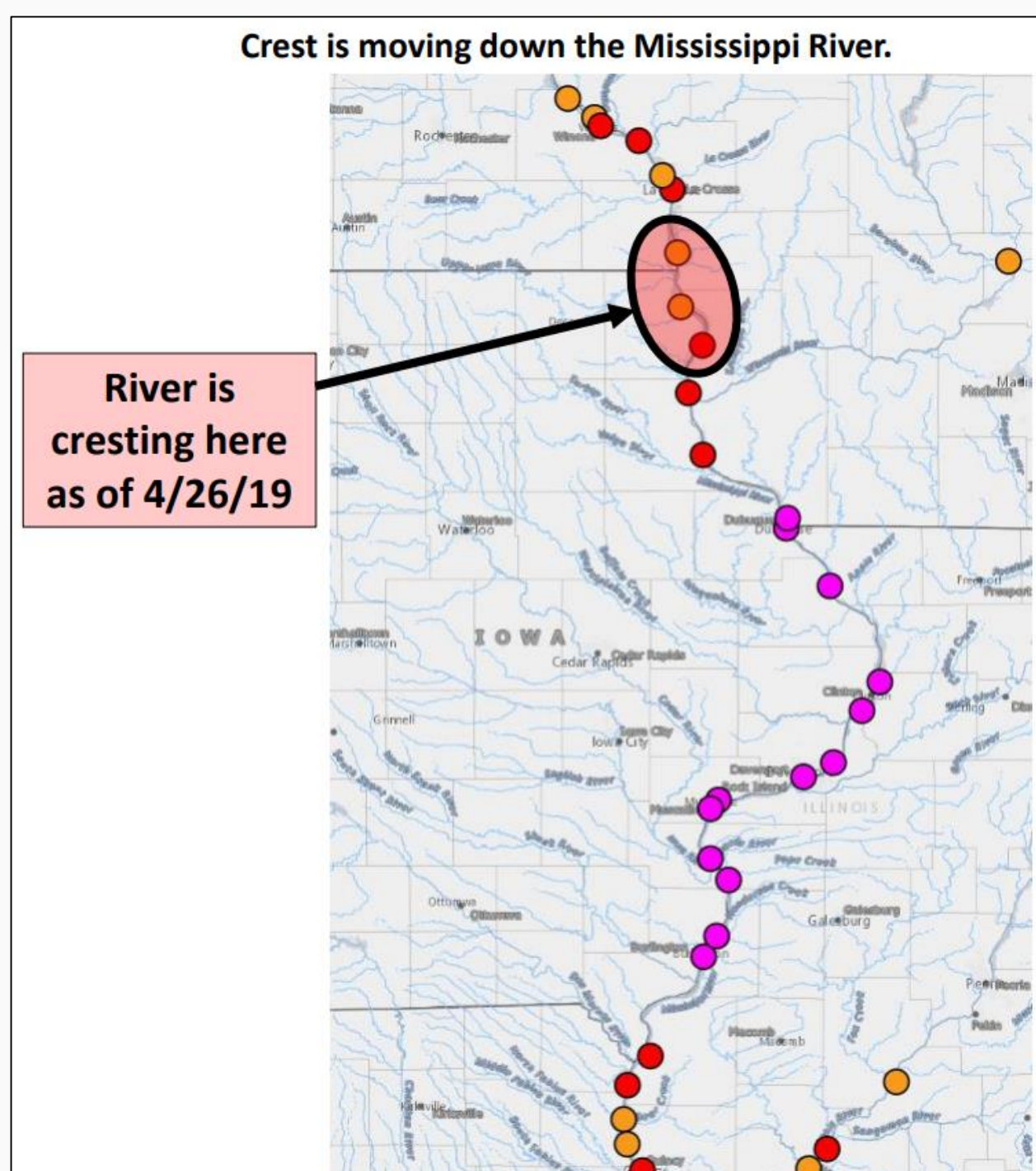
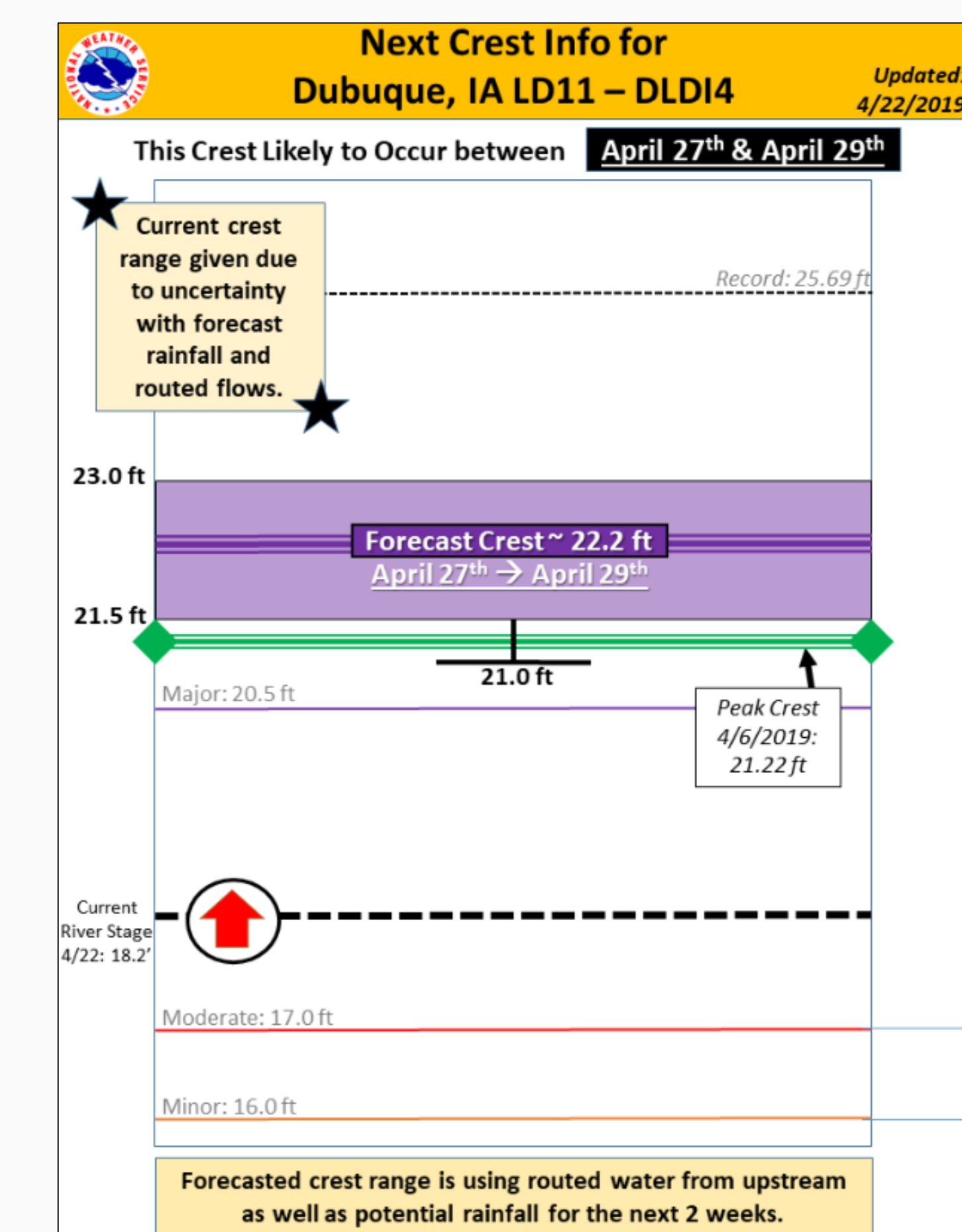
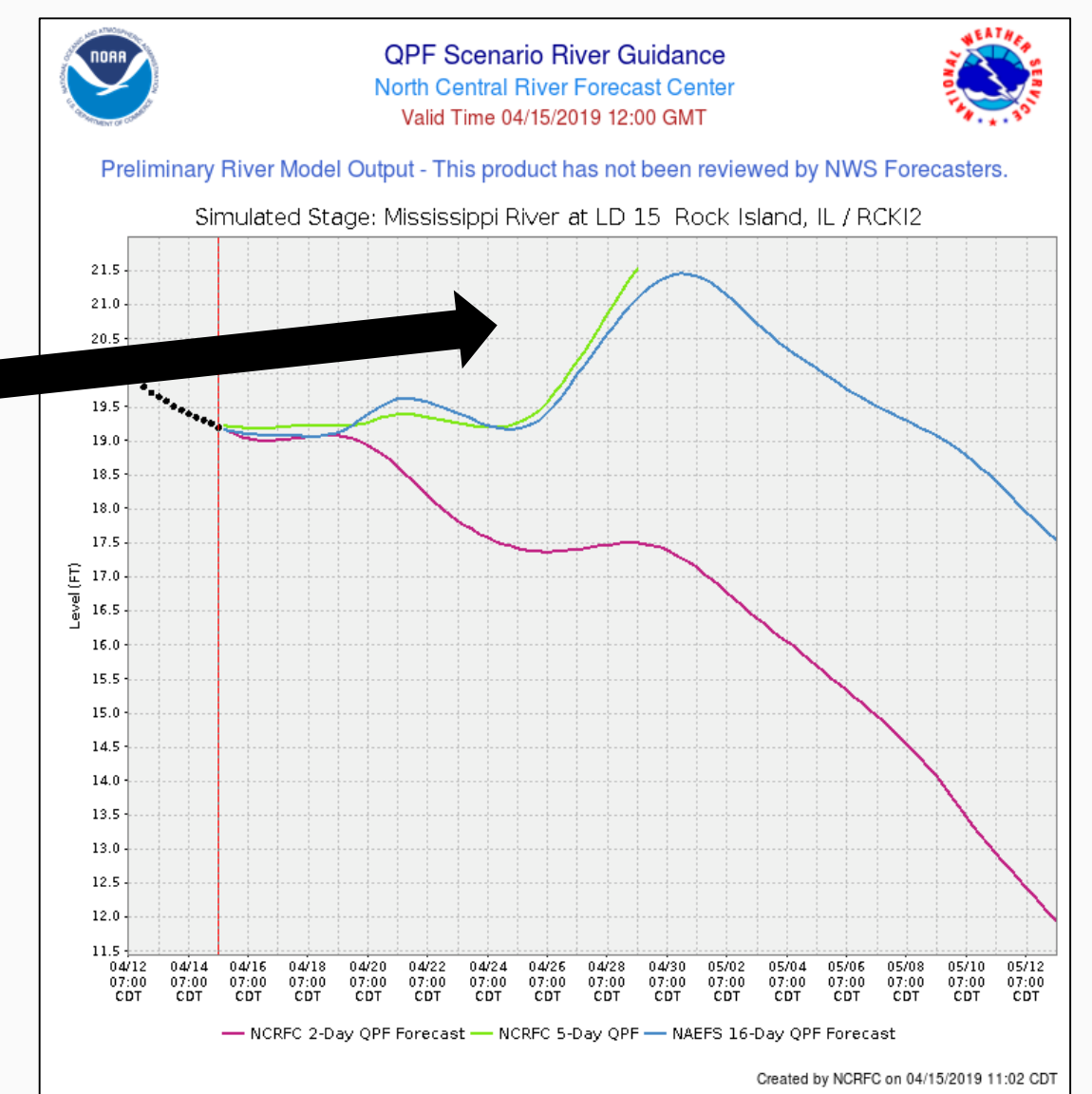
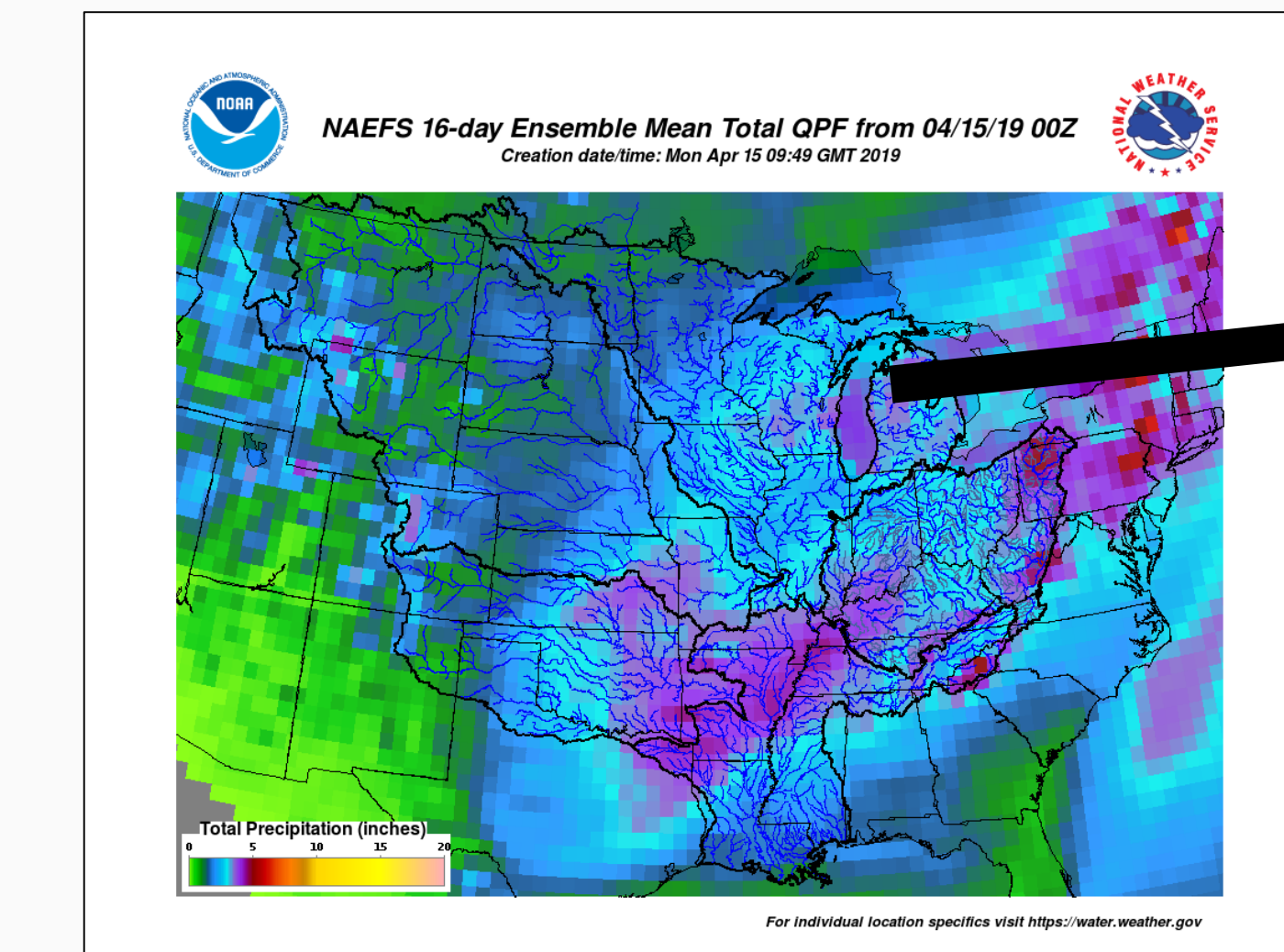
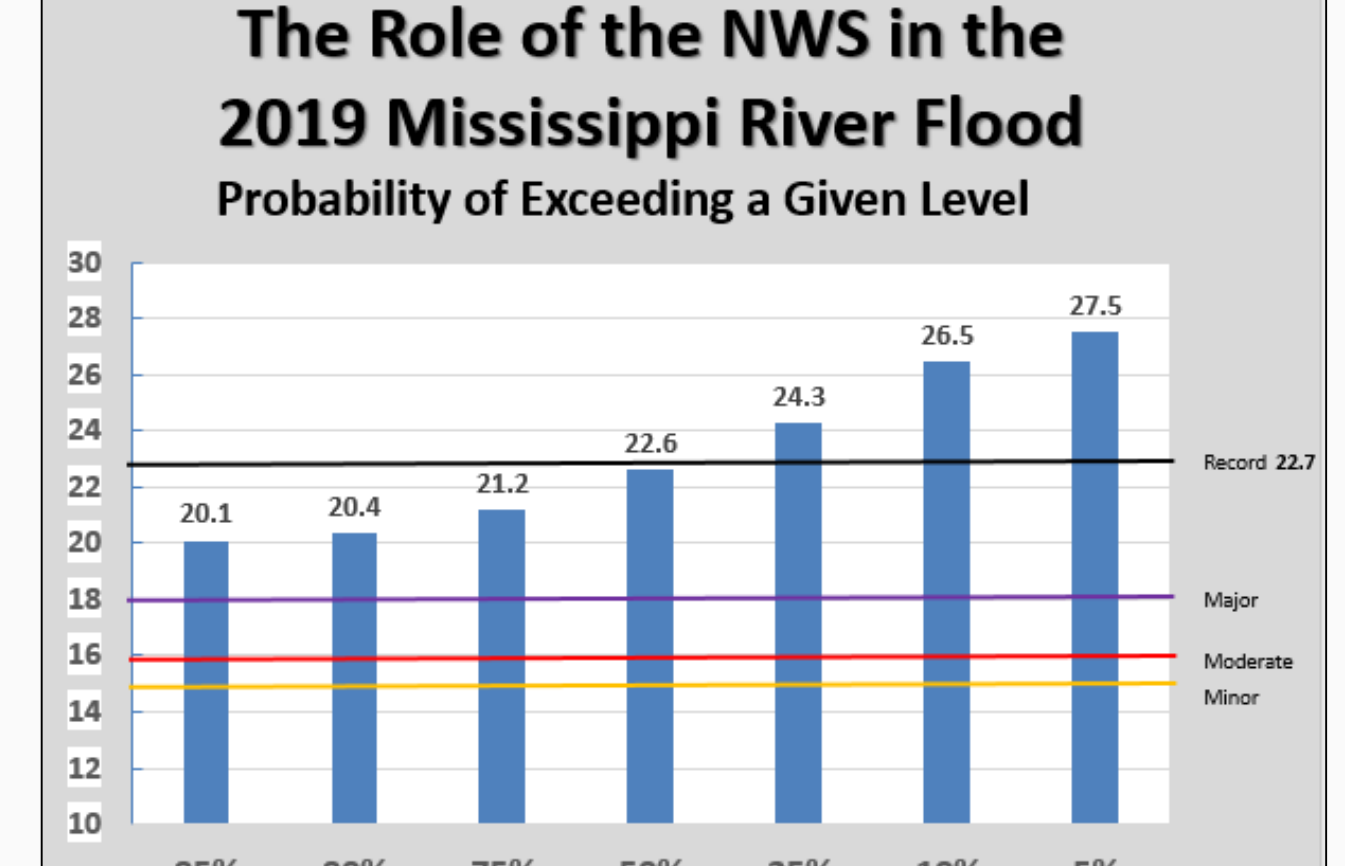
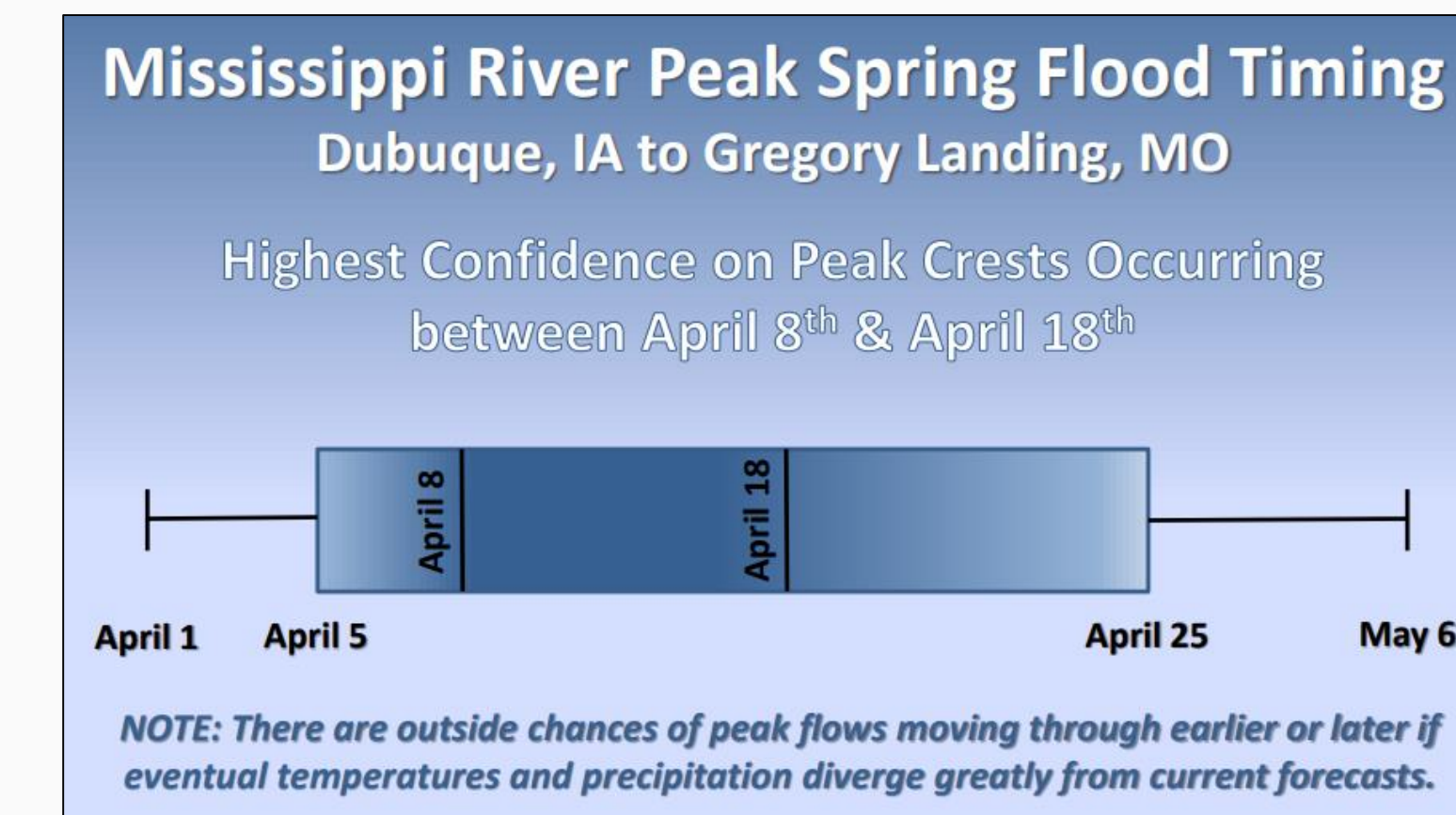
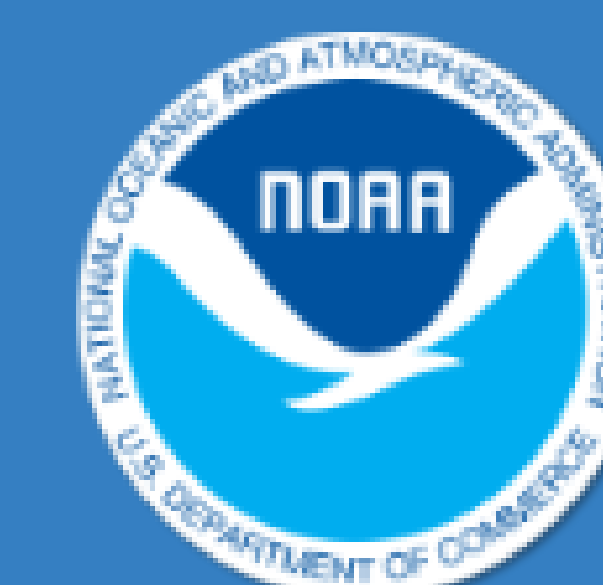
Probabilistic river forecasts are needed for partners making important decisions for flood fighting.



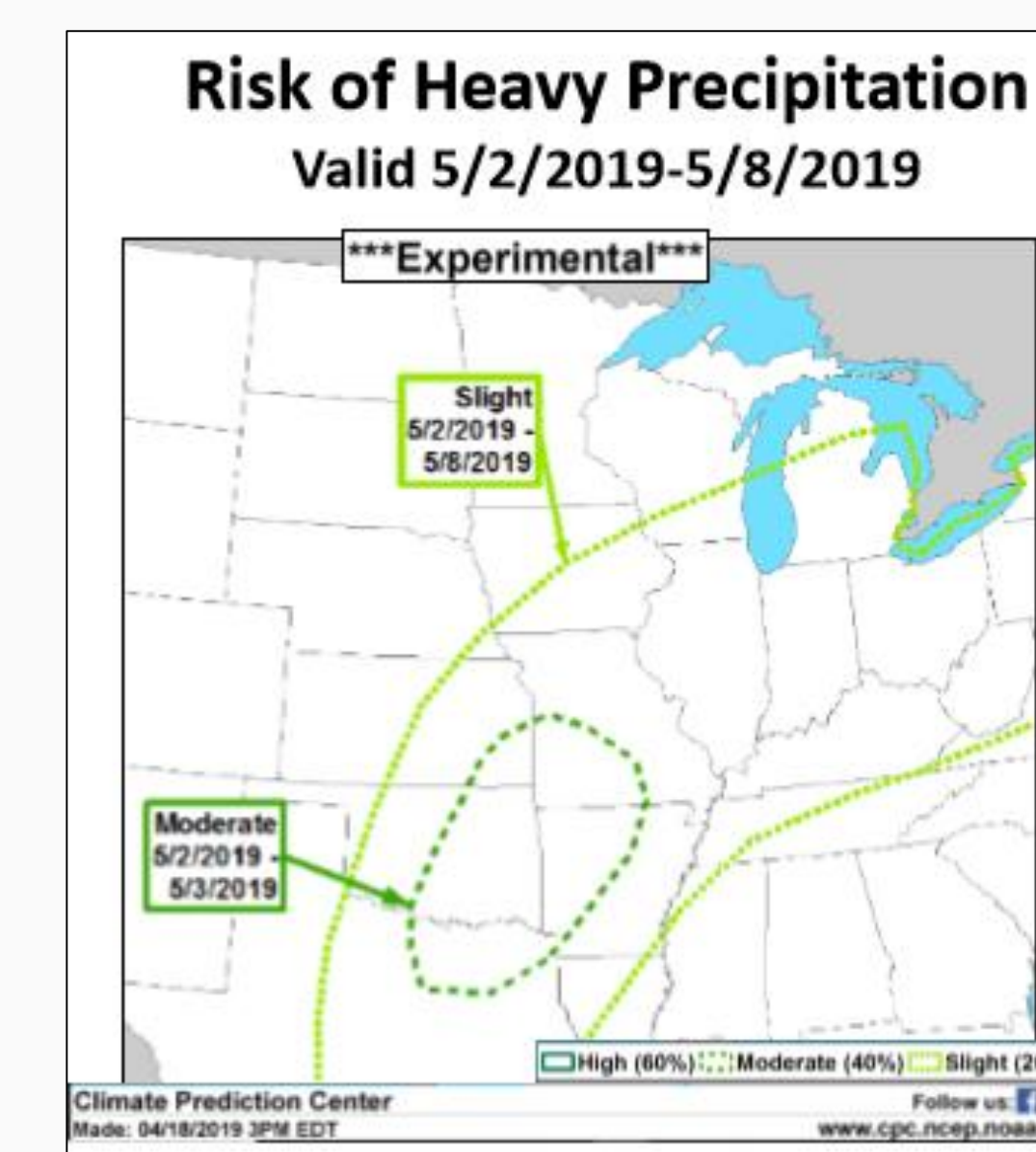
Counting on the Contingencies: How Quickly Evolving IDSS Strategies Enhanced Services during the Record Mississippi River Flood of Spring 2019



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Location	Reach At Least High Confidence	Most Likely Crest Range	High End Potential Low Confidence	Crest Timing
Dubuque LD 11	19.0	19.5 → 20.5	21.0	6/3 → 6/5 *
Dubuque RR Bridge	20.5	21.0 → 22.0	23.0	6/3 → 6/5 *
Bellevue LD12	18.5	19.0 → 20.0	20.5	6/4 → 6/6 *
Fulton LD13	19.3	19.5 → 20.5	21.0	5/31 → 6/2 **
Camanche	20.5	20.5 → 21.5	22.5	5/31 → 6/2 **
Le Claire LD14	14.0	14.0 → 15.0	16.0	5/31 → 6/2
Rock Island LD15	20.0	20.5 → 21.5	22.5	5/31 → 6/2
Illinois City LD16	20.5	20.5 → 22.0	23.5	5/31 → 6/2
Muscatine	22.3	22.5 → 23.5	24.5	6/1 → 6/3
New Boston LD17	21.7	22.0 → 23.0	24.0	6/1 → 6/3
Keithsburg	20.5	21.0 → 22.0	23.0	6/1 → 6/3
Gladstone LD18	17.7	18.0 → 20.0	21.5	6/1 → 6/3
Burlington	21.7	22.5 → 23.5	25.0	6/1 → 6/4
Keokuk LD19	23.0	23.5 → 25.0	26.0	5/31 → 6/4
Gregory Landing	24.0	24.5 → 25.5	26.5	5/31 → 6/4



Main Points

- Mississippi River – rises are expected to begin over the weekend!
- Confidence is high that renewed rises will occur.
- Confidence is not high on the degree of rises, fairly wide potential range
- Tributary Rivers – rises are likely with most watersheds getting moderate to heavy rain at some point over the next week.
- Flooding?? Near Bankfull??
- Chances for Excessive Rainfall/Flash Flooding tonight through Sunday
- Rain is expected daily for the next week.
- Active weather through week 2.

Current forecasts viewed on the NWS webpage only incorporate 24 hours of forecast rainfall. These forecasts show what would occur with dry weather beyond 24 hours.

* Opinions expressed here are those of the author and do not necessarily reflect the views of NOAA or the NWS.