Actionable Intelligence from the National Water Center Products and National Water Model Visualization Services: Kentucky Flood Event July 2022

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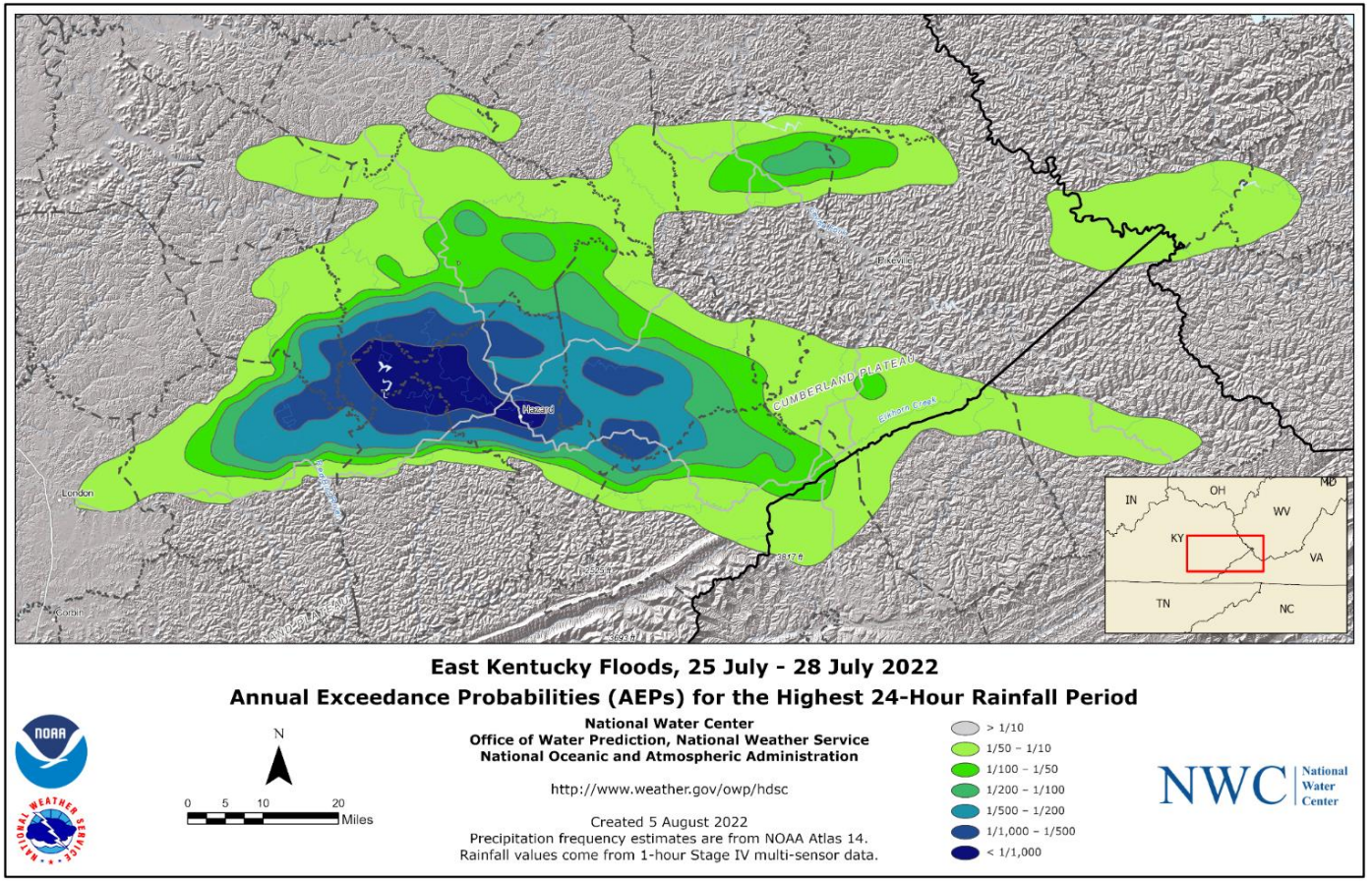
NOAA National Weather Service
National Water Center
Office of Water Prediction
Tuscaloosa, AL, USA

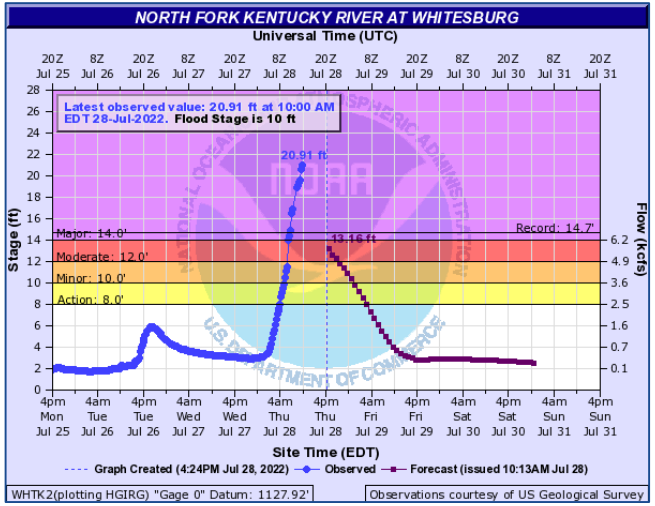
AMS 104th Annual Meeting
Advances in Large-scale Flood Modeling, Monitoring, Forecasting, Analysis, and Management I
January 31, 2024

Rainfall Totals / Annual Exceedance Probabilities

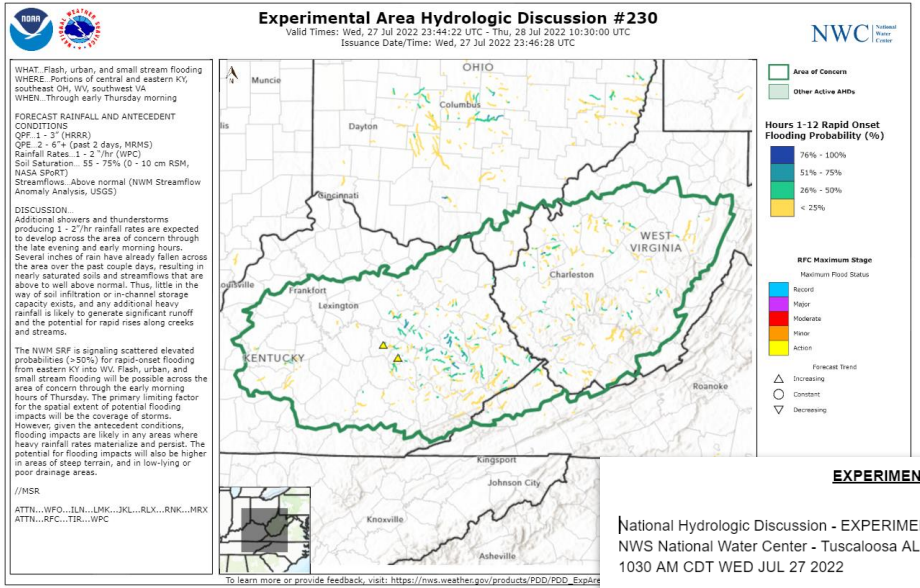


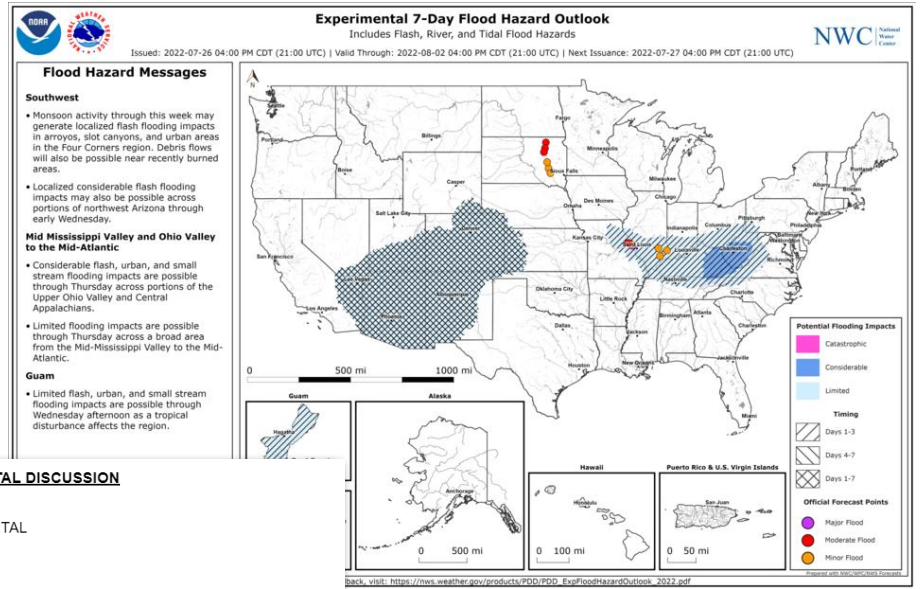
Impacts

- Catastrophic flash flooding in Eastern Kentucky from July 25-29, 2022
- Claimed the lives of 43 people
- Deadliest non-tropical flood event in the United States since the late 1970s
- Record flooding of the North Fork of the Kentucky River (Jackson and Whitesburg)



NWC Experimental Products (Publicly available)





EXPERIMENTAL DISCUSSION

National Hydrologic Discussion - EXPERIMENTAL
NWS National Water Center - Tuscaloosa AL
1030 AM CDT WED JUL 27 2022

.Synopsis...

Considerable flooding impacts in the Ohio and Tennessee River Valleys and Central/Southern Appalachians… Isolated flood threat will continue into next week despite drier conditions across the Four Corners Region into the Central Rockies and Southern Plains… Flooding continues across the Mid-Mississippi Valley into the Lower Ohio Valley…

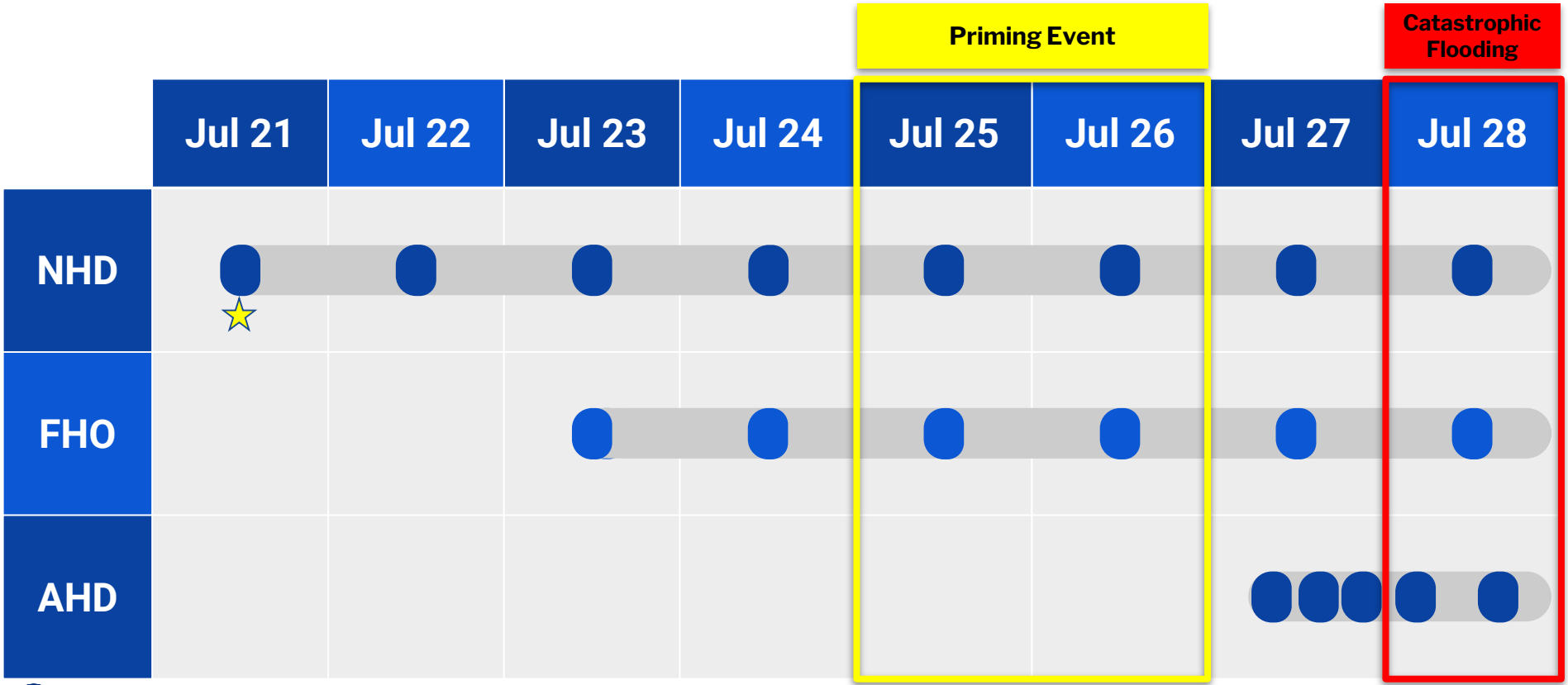
.Discussion...

.Ohio and Tennessee River Valleys and Central/Southern Appalachians...

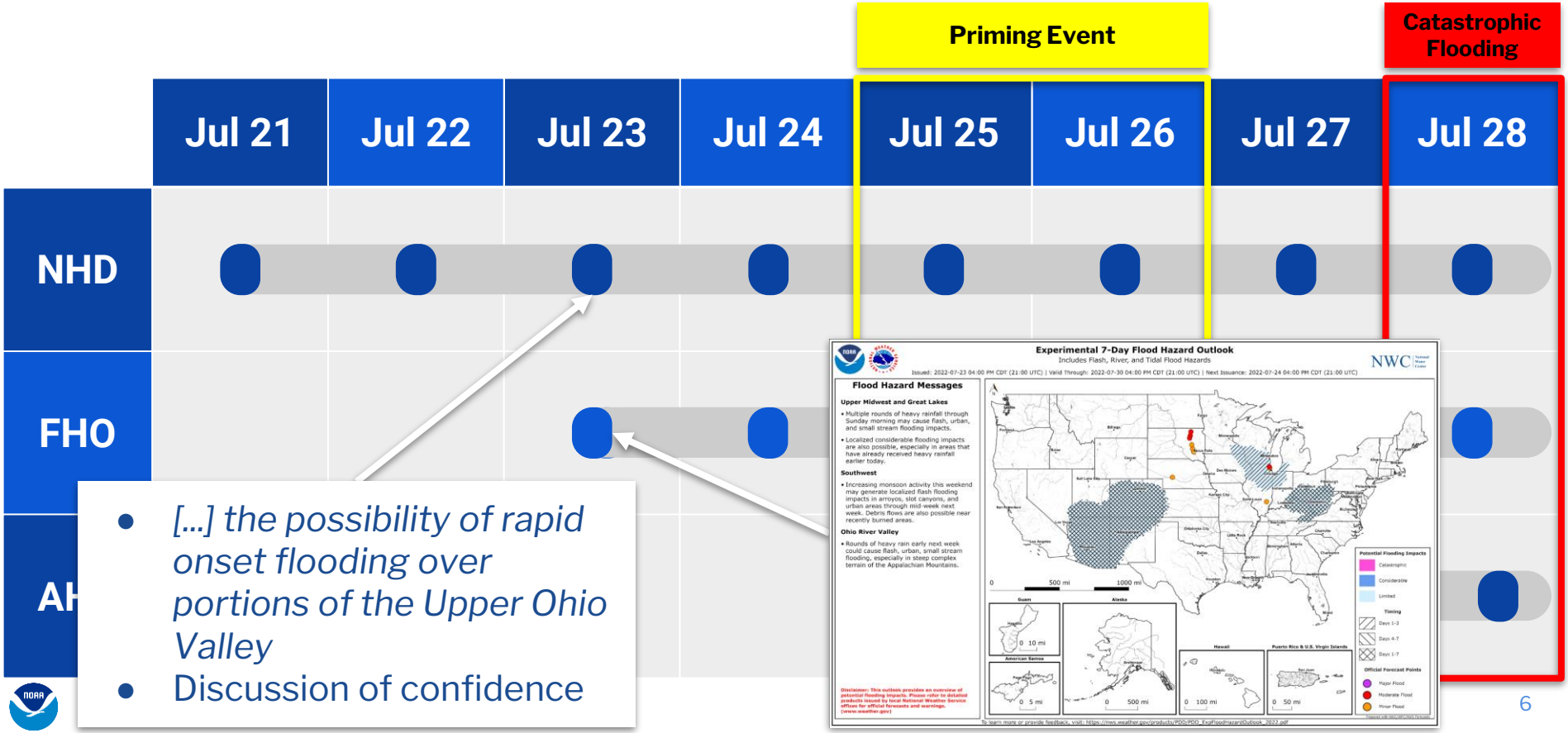
A stalled frontal boundary across the region will continue to be the focus for several rounds of heavy rainfall and flash, urban, and small stream flooding impacts into next week, with considerable flooding impacts likely across extreme southeast OH, eastern KY, southern WV, and potentially into extreme western VA on days 1 - 2 (Wed - Thu). Although western portions

www.weather.gov/owp/operations

NWC Experimental Products Timeline

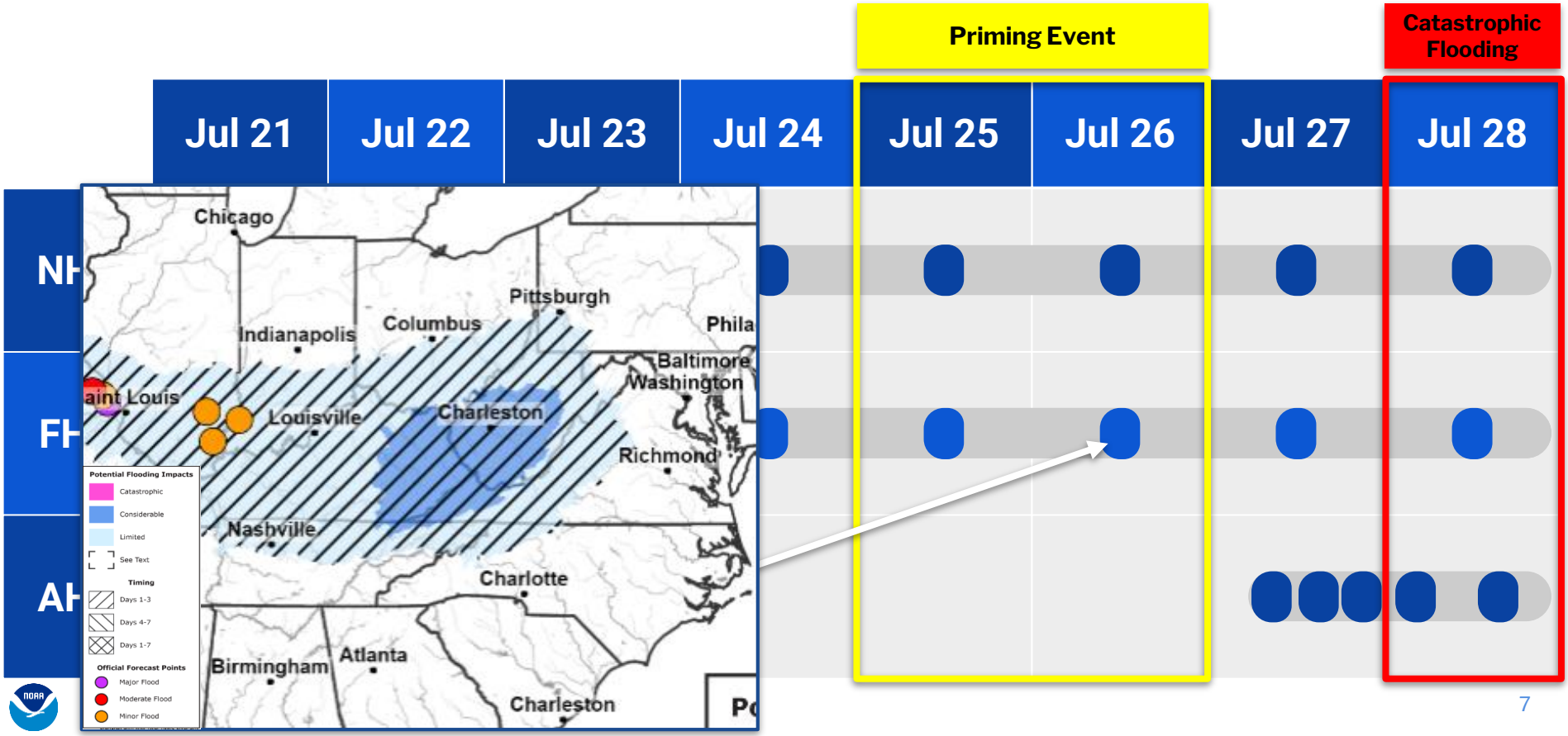


NWC Experimental Products Timeline, cont.



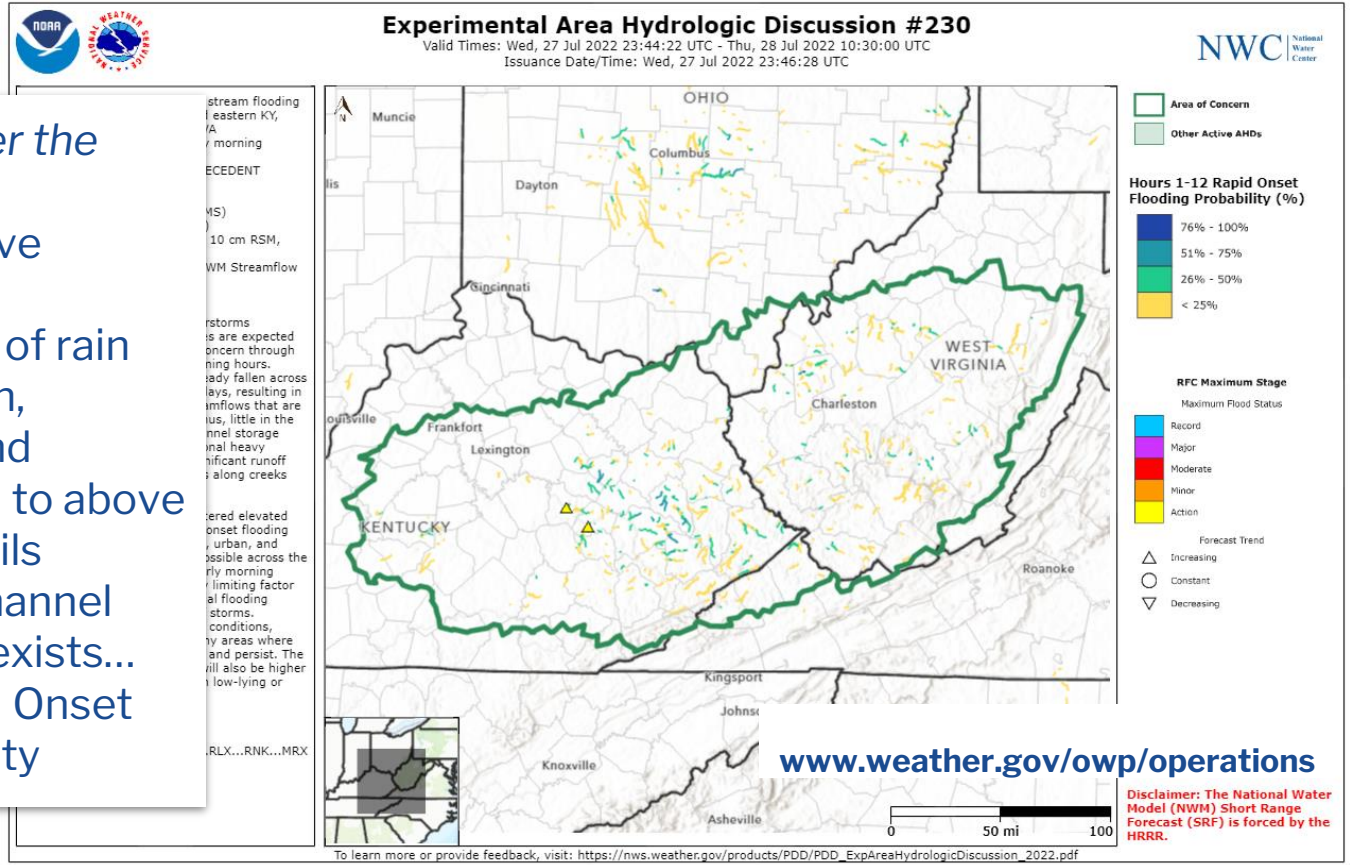
- *[...] the possibility of rapid onset flooding over portions of the Upper Ohio Valley*
- Discussion of confidence

NWC Experimental Products Timeline, cont.



NWC Experimental Products Timeline, cont.

- *[…] QPE: 2-6”+ over the past 2 days*
- Streamflows: above normal
- […] Several inches of rain have already fallen, saturating soils and elevating streams to above normal […] little soils infiltration or in channel storage capacity exists…
- […] elevated Rapid Onset Flooding probability signals…

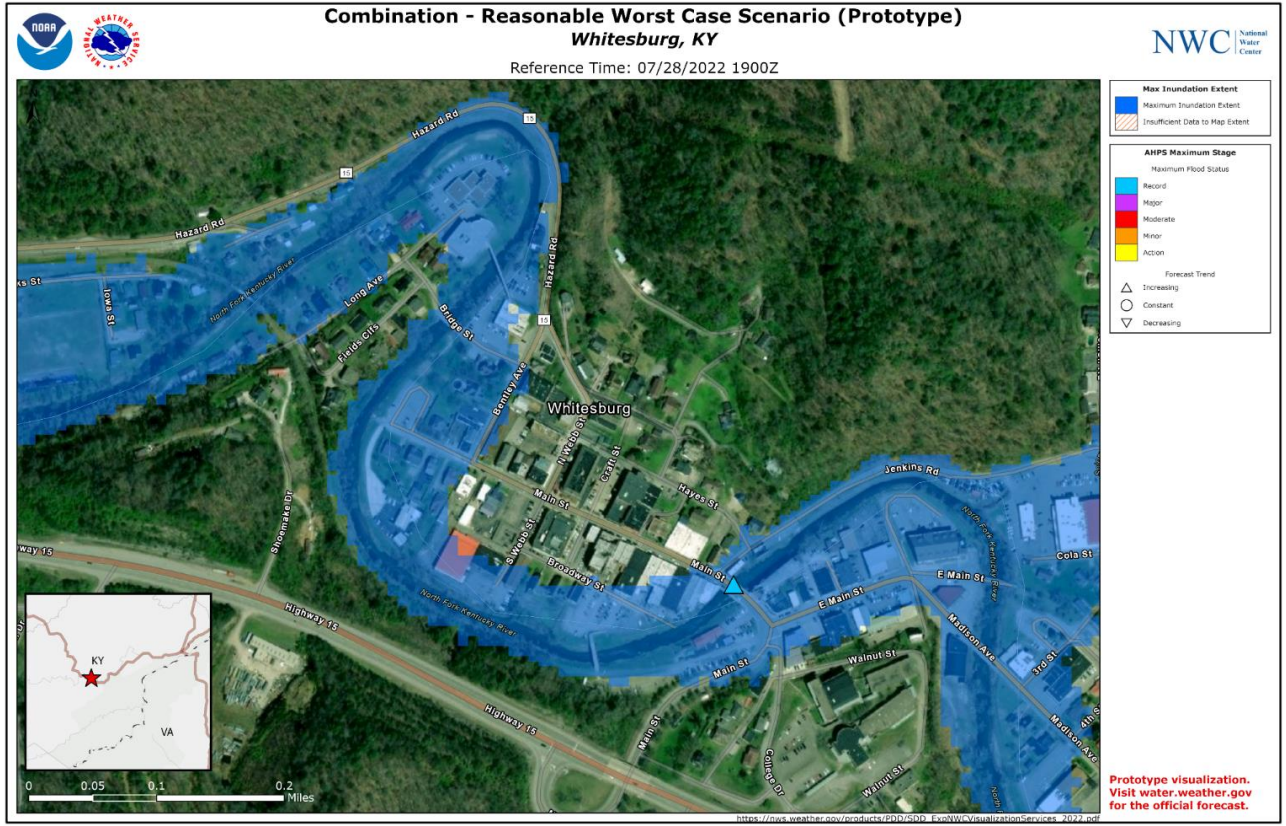


FEMA Support - NWS Flood Inundation Mapping

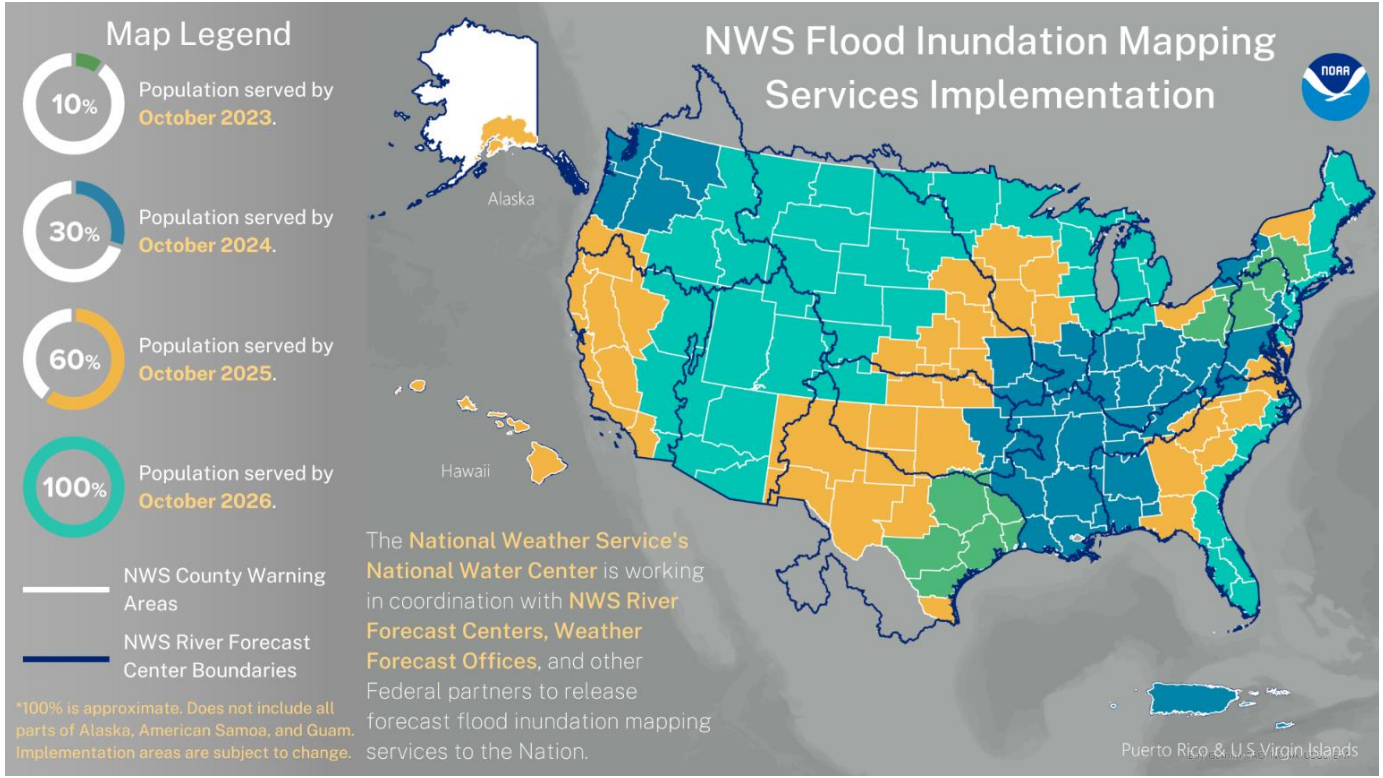
Morning of 28 July, NWC responded to FEMA HQ request quickly and provided the prototype NWS Flood Inundation Mapping to FEMA HQ

- Only available FIM to FEMA HQ at the time at this location.

Informed search and rescue operations



NWS Flood Inundation Mapping Services Implementation Plan



https://www.weather.gov/owp/operations

Summary

- Unprecedented rainfall event with significant loss of life and catastrophic structural damage

- NWC communicated the potential significance of this event through experimental products (NHD, FHO, and AHD) days ahead.
  - First showed up in NWC products 7 days before the event, and continued the highlight through day of event.

- NWS FIM was the only FIM that FEMA had at the time at Whitesburg, KY, and was used in the immediate search and rescue operations, recovery planning, distribution of emergency personnel and resources, etc
  - **NWS FIM will be available in the near future to help the public and emergency managers prepare for flooding impacts**

Thank You!

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https://water.noaa.gov
https://www.usajobs.gov

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