

A high-speed photograph of water splashing, creating a dynamic, blue-toned background with various droplets and ripples.

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PREDICTION

12A.1 Implementation of Forecast Flood Inundation Mapping Services for the Nation



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National Water Center

Outline

- Progress to date on our FIM Services Implementation for the Nation
- Examples of our new Experimental Flood Inundation Services
- Where you can access our Experimental National Water Model & Flood Inundation Services

Map Legend



Population served by
October 2023.



Population served by
October 2024.



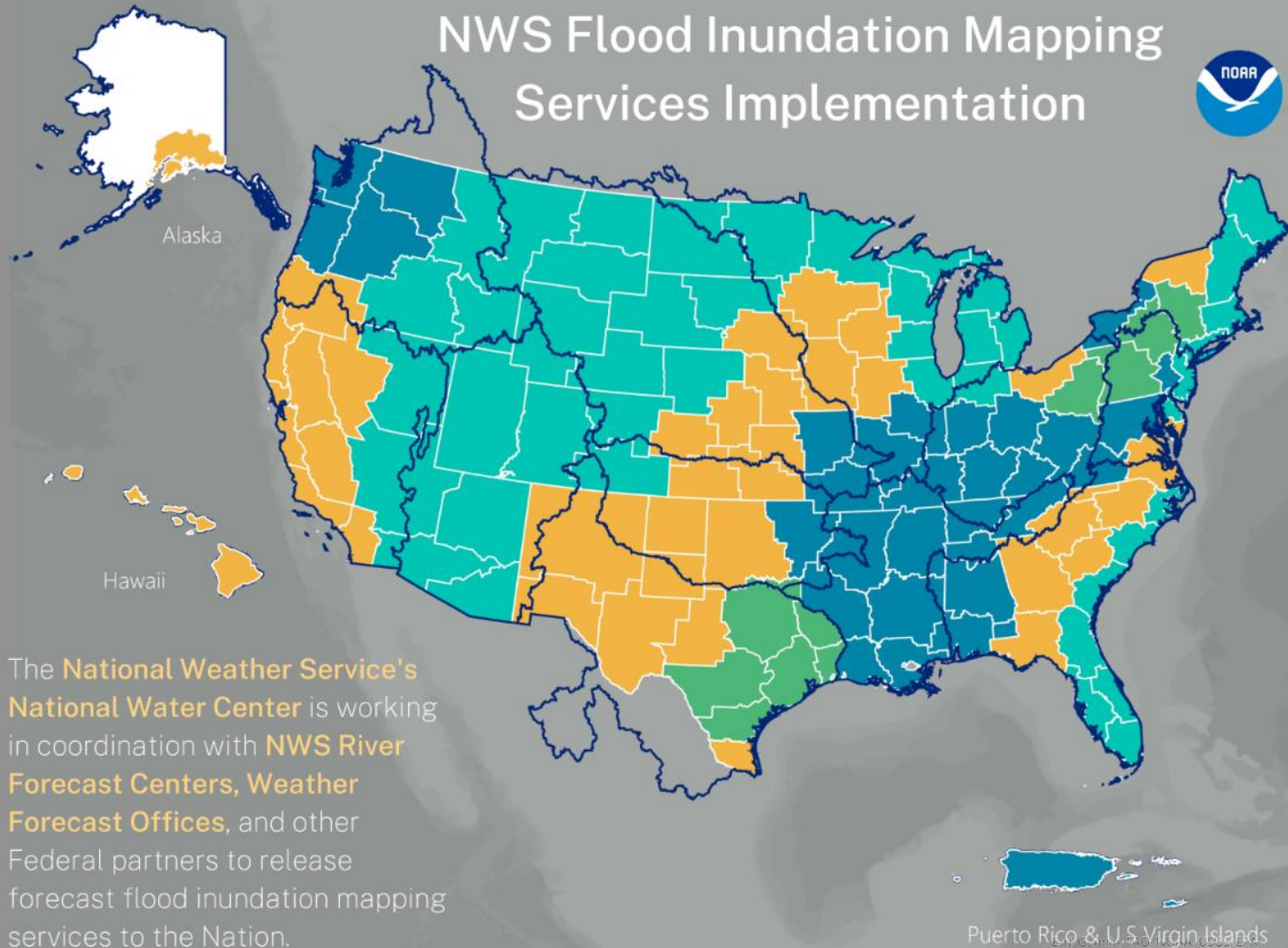
Population served by
October 2025.



Population served by
October 2026.

NWS County Warning
Areas

NWS River Forecast
Center Boundaries



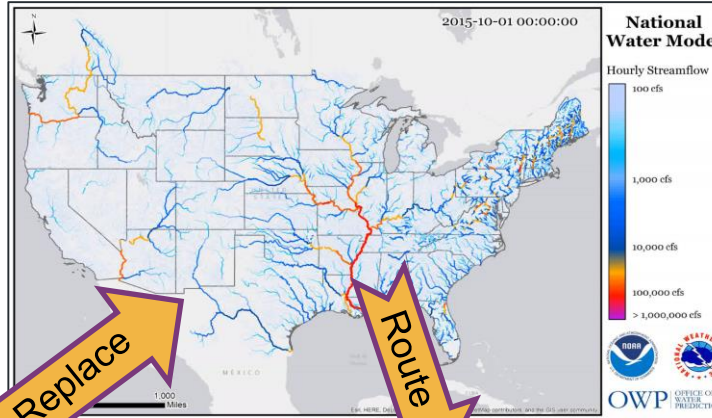
*100% is approximate. Does not include all parts of Alaska, American Samoa, and Guam. Implementation areas are subject to change.

The Method behind FIM Services: Height Above Nearest Drainage (HAND)

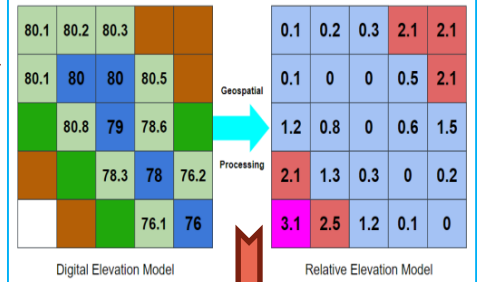
Deliver Forecast Flood Inundation Services

National Water Model Guidance

Completely automated process with no forecaster engagement – but provides complimentary guidance on ~3.4 million stream miles nationwide, including Puerto Rico and the Virgin Islands, Hawaii, and by the fall - portions of Alaska

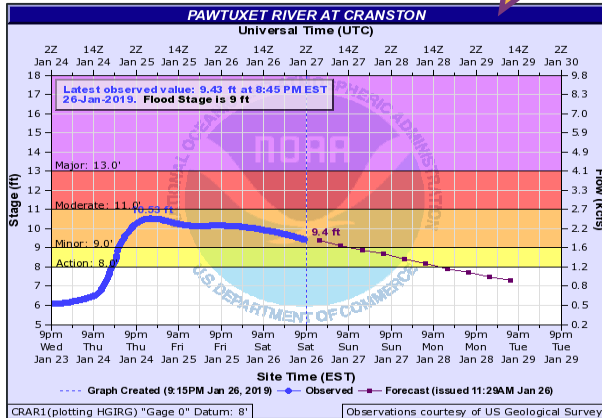


Height Above Nearest Drainage (HAND)

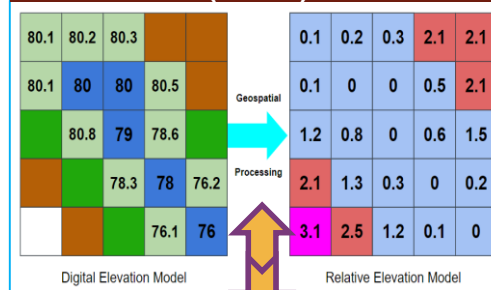


River Center Forecasts

Forecasters heavily engaged in the forecast production

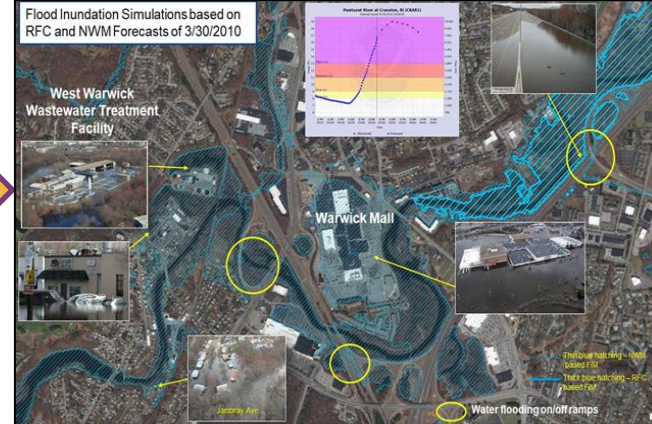


Height Above Nearest Drainage (HAND)

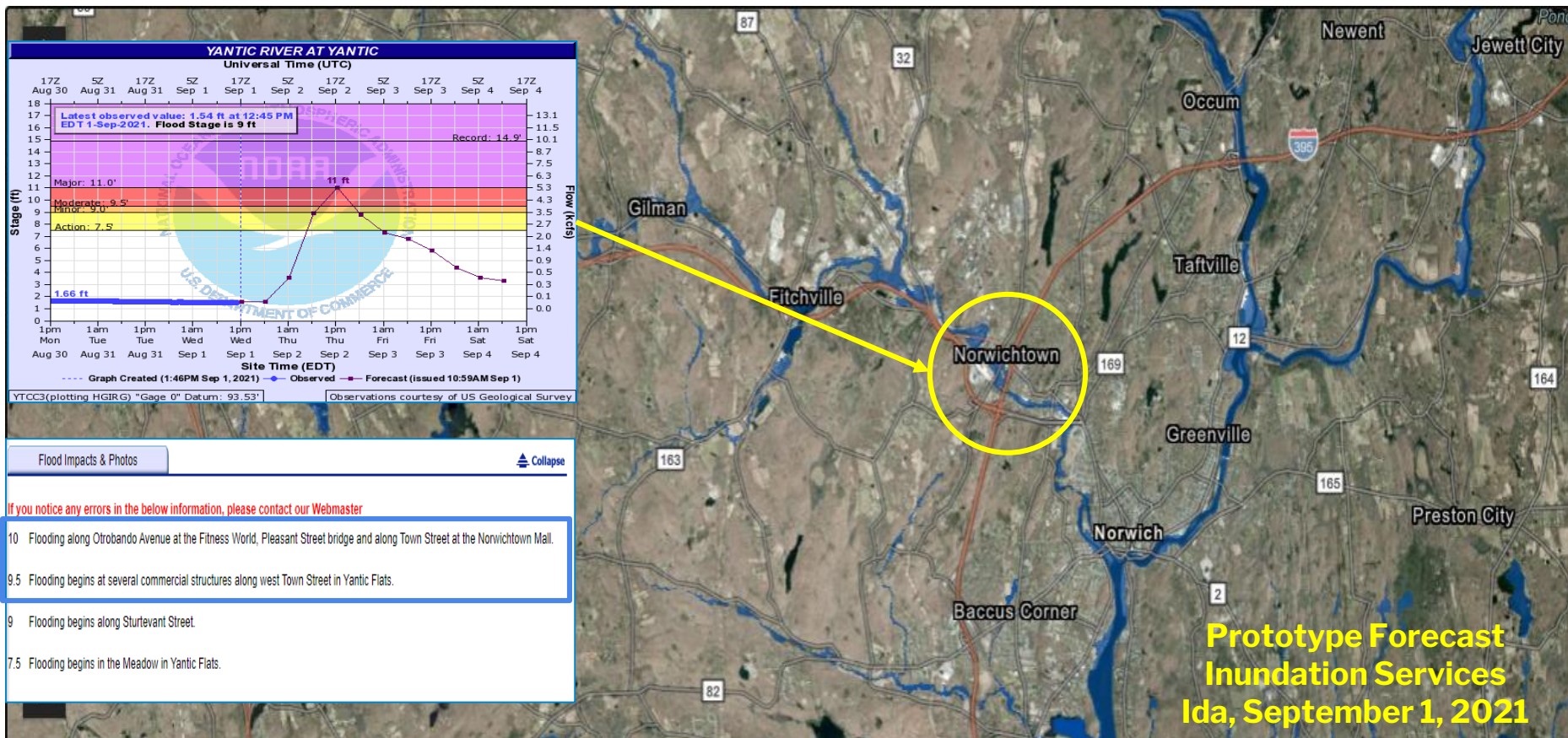


+RASToFIM & RASoREM techniques

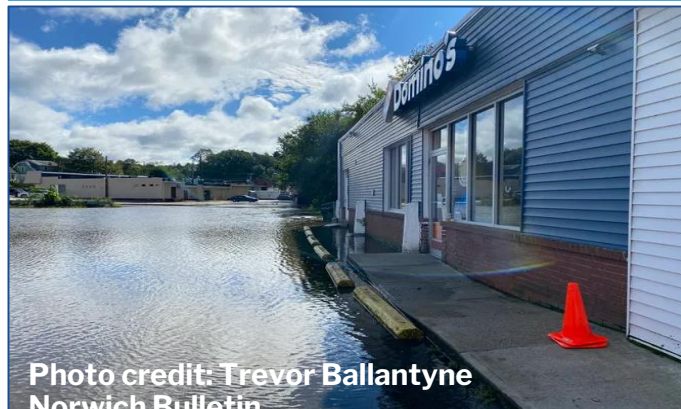
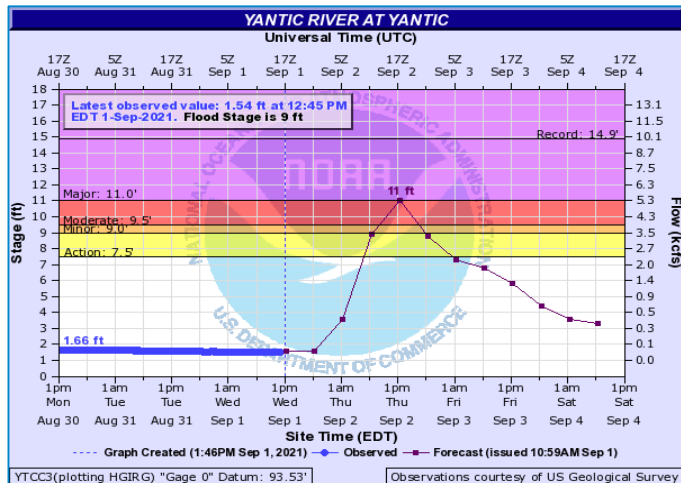
Pawtuxet River Valley – West Warwick/Warwick



Value of FIM Services - Visualizations to depict impacts



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Integrating FIM Services into our IDSS

Disclaimer: This experimental map represents the NWS's best approximation of inundation based upon modeled river discharge

Yantic River at Yantic, CT

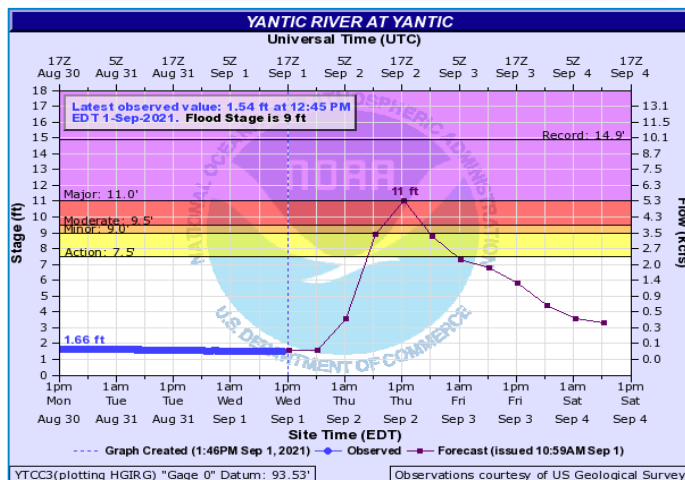
Forecast Crest Height: 11 Feet

Map Height Shown: 11 Feet

FIM Source: RFC FIM 5 Day Max Extent

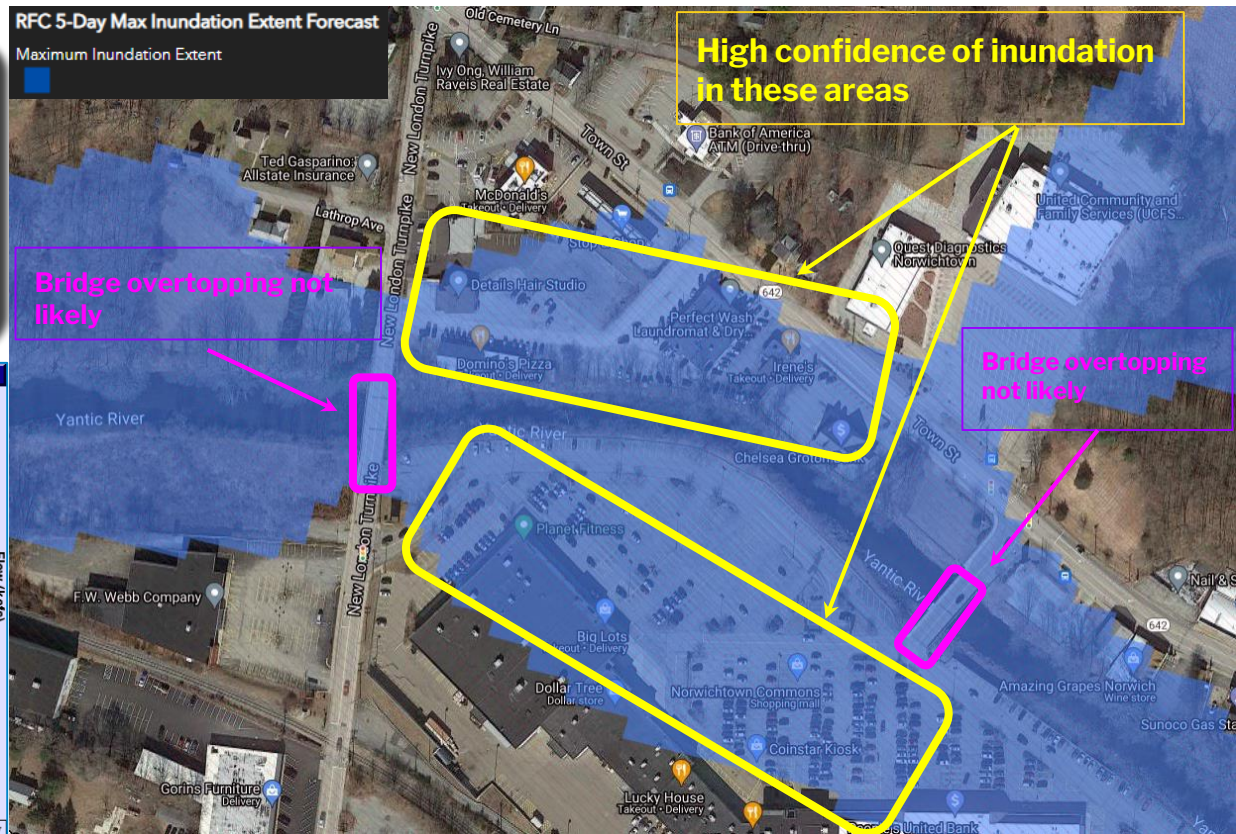
FIM Type: Dynamic (Depth NOT Included)

FIM Creation Time: Sept 1st, 1 pm



RFC 5-Day Max Inundation Extent Forecast

Maximum Inundation Extent



Initial FIM Rollout - National Viewer





Experimental Services

- FIM Services available for 10% of the nation
 - *NWM Latest Analysis FIM*
 - *RFC 5-Day Max Extent FIM*
 - *NWM 5-Day Max Extent FIM*
- Services available on our NWS National Viewer alongside the existing NWM visualizations
 - (<https://viewer.weather.noaa.gov/water>)
 - *High Water & Peak Flow Arrival Time, Max High Flow Magnitude Forecast, & High Water Probability Forecasts*
 - *Rapid Onset Flooding Probability Forecasts*
- Services available for ingest into your local GIS systems



Dynamic FIM Services Comparison Table



FIM Service	NWM Latest Analysis FIM	RFC 5-Day Max FIM	NWM 5-Day Max FIM
			
Data Type	Observation based simulations [precip. estimates & USGS gage observations]	Forecast [5-day RFC forecasts]	Forecast [5-day GFS]
Total Latency	55 minutes	45 minutes	6 hours 30 minutes
Updates	Hourly	Hourly [if new forecasts available]	Every 6 hours
HAND Inputs	Flow	Flow	Flow
Threshold Source [NWM/RFC]	NWM High Water	RFC	NWM High Water
Error Sources	<ul style="list-style-type: none">• RADAR or gage malfunctions• For ungaged reaches, errors associated with NWM & estimated precipitation• HAND errors [10m DEM resolution]	<ul style="list-style-type: none">• Rainfall forecast• RFC flow simulations• Routing of flow using NWM physics• HAND errors [10m DEM resolution]	<ul style="list-style-type: none">• GFS forecast• NWM flow simulations• HAND errors [10m DEM resolution]
FIM Domain	Entire NWM domain [CONUS, HI, PR, US Virgin Islands]	Downstream of AHPs forecast points	CONUS
Mapping Threshold	Only available for reaches that meet and/or exceed the "High Water" threshold	Only available based on active RFC forecasts at or above "Action Stage"	Only available for reaches that meet and/or exceed the "High Water" threshold
When to Use	Use as a snapshot of the most recent modeled inundation	Use when RFC forecast is available	Use for rivers and streams not covered by RFC forecast



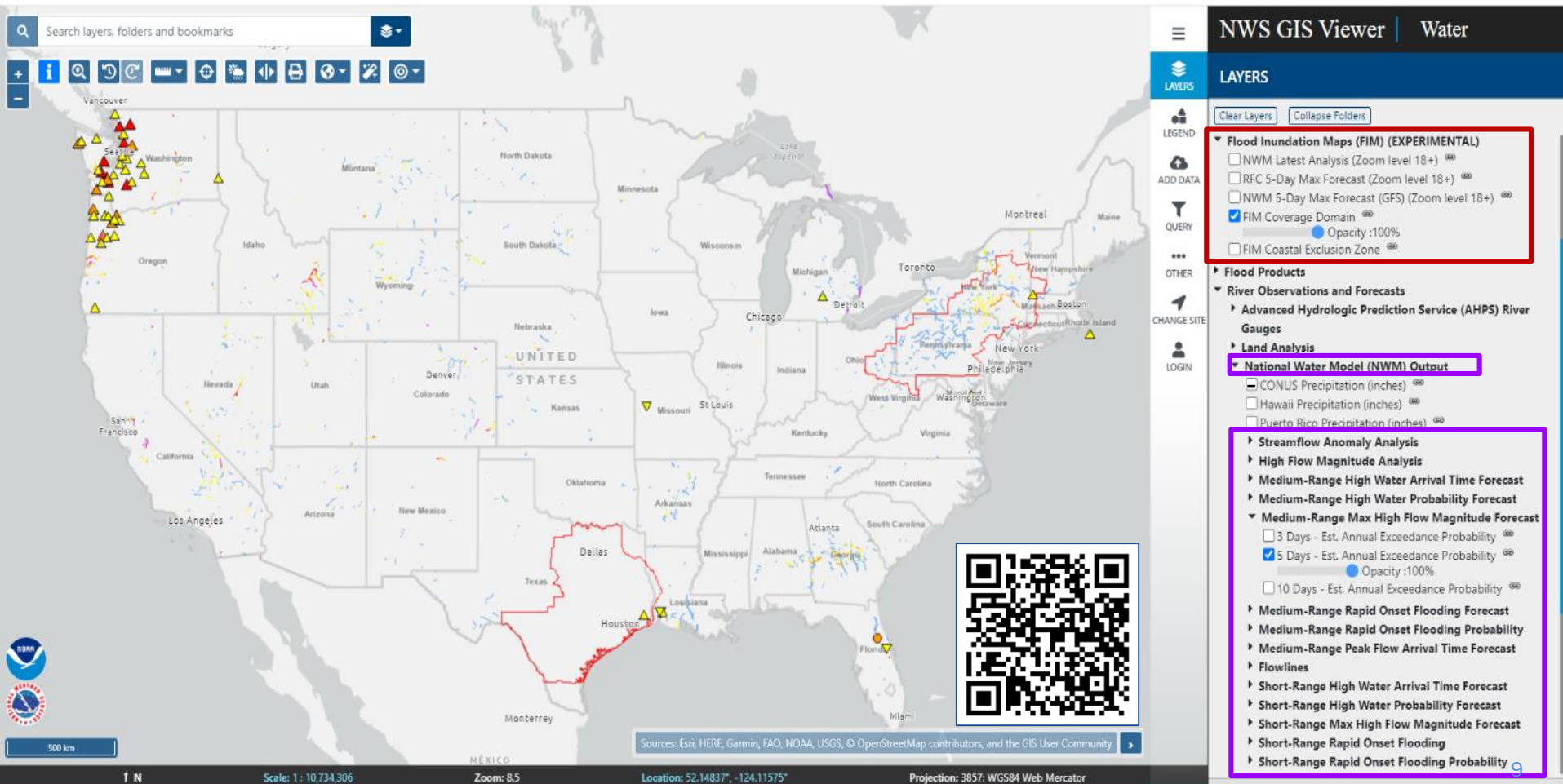
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<https://www.weather.gov/owp/operation>

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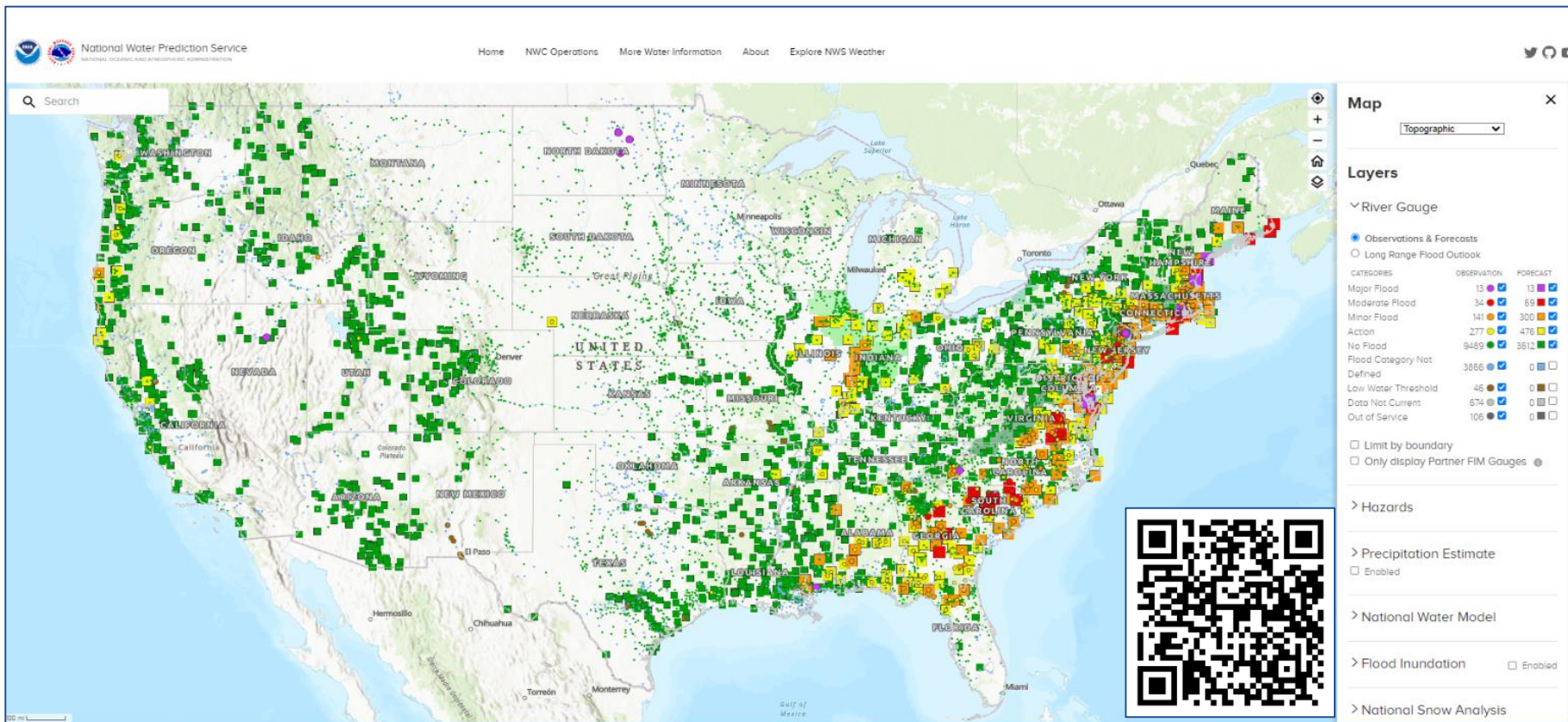
National Water Model & Flood Inundation Services



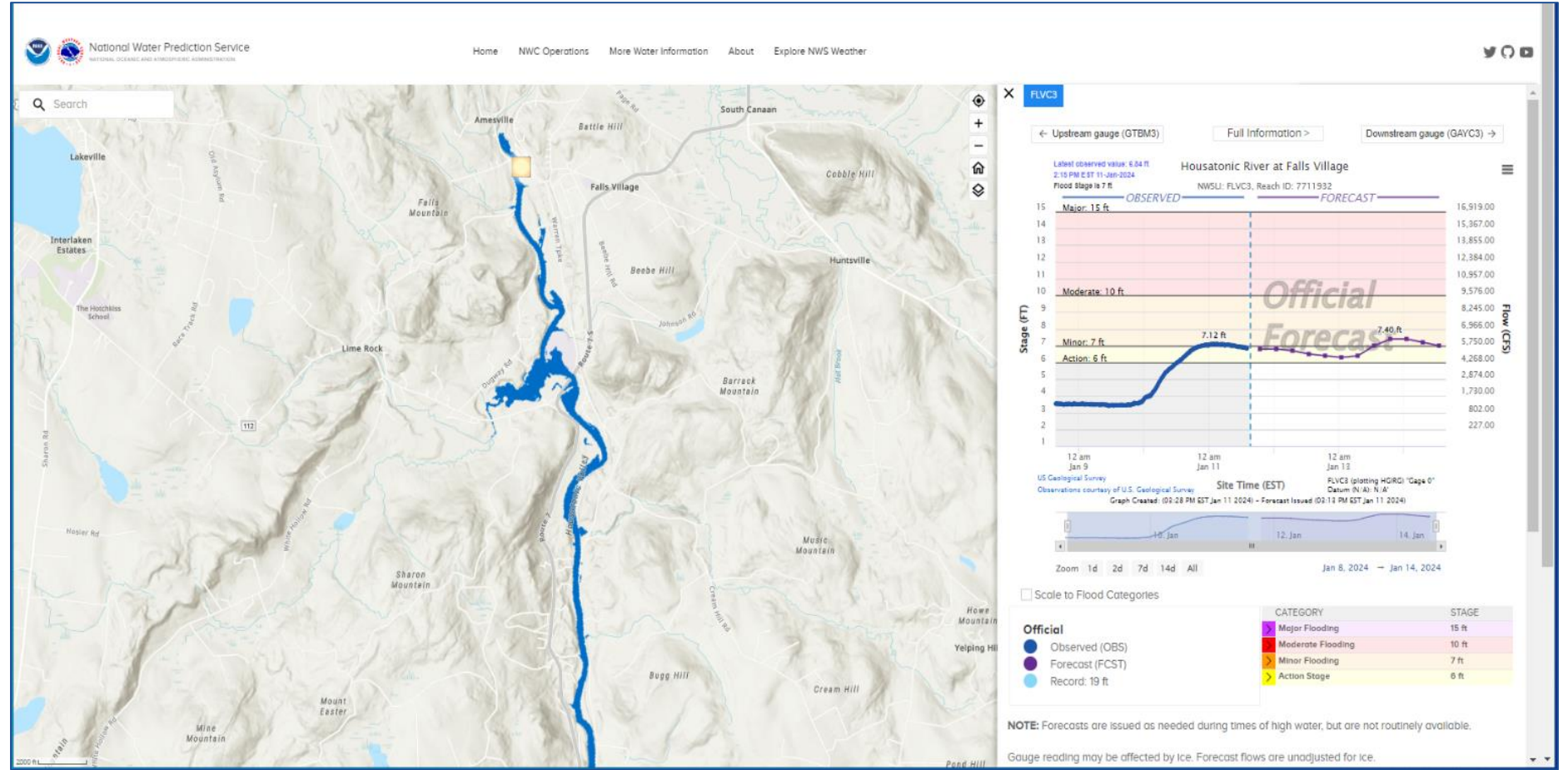
This experimental map represents the NWS's best approximation of inundation extent based upon modeled river discharge

National Hydrologic Prediction System

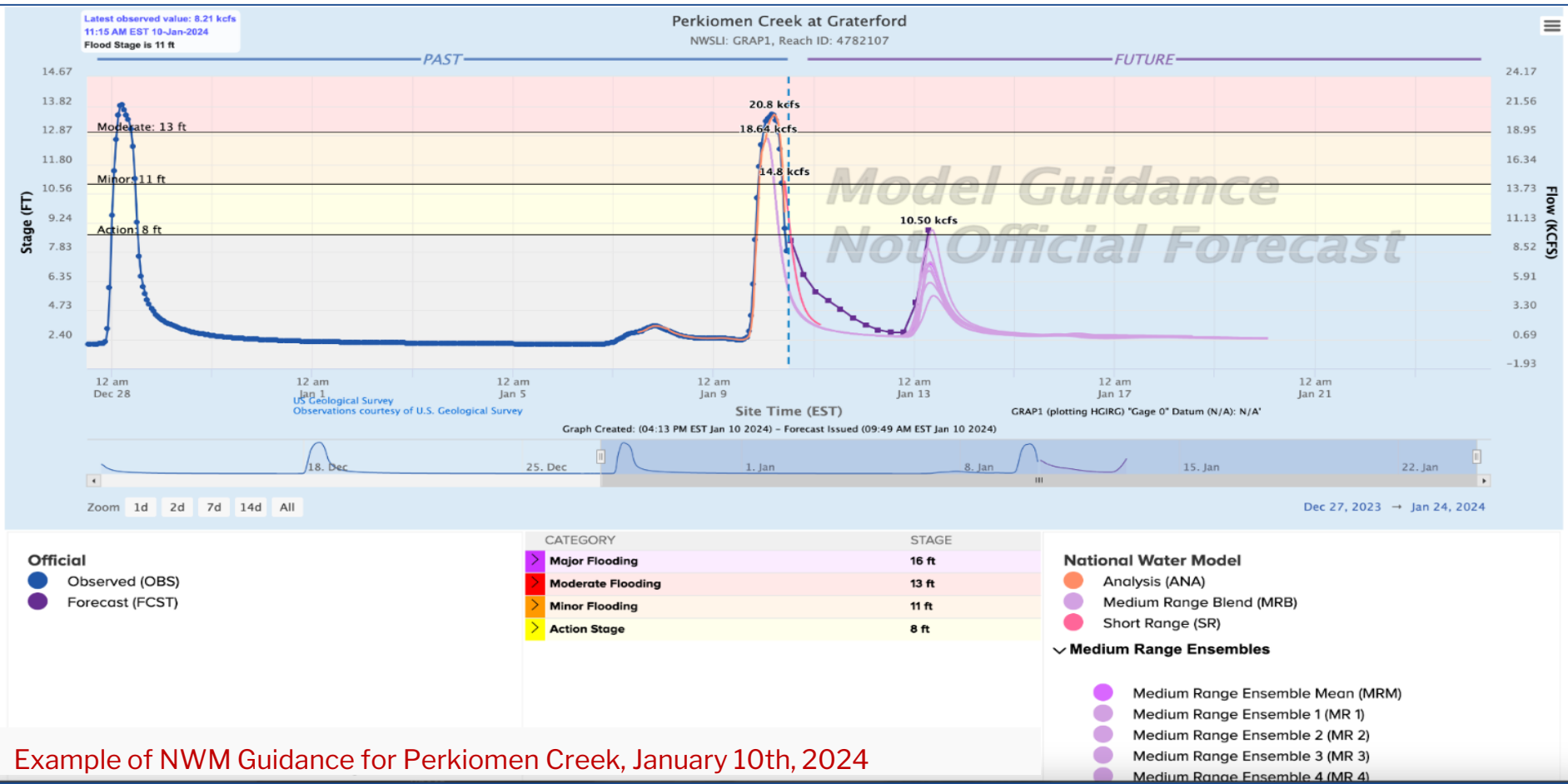
Implementation set for March 27th



National Hydrologic Prediction System - coming in late March



National Hydrologic Prediction System - coming in late March





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Thank You!



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<https://water.noaa.gov>