

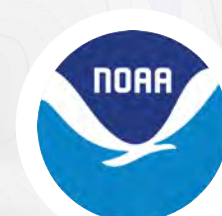
## Dynamic FIM Services Factsheet [Public Domain]

Dynamic Flood Inundation Mapping [FIM] Services provide real-time and forecasted flood inundation maps, offering critical insights into potential flood risks across the United States. These services leverage advanced models and real-time data to predict the extent of water overflow. Currently, there are three publicly available Dynamic FIM services, which represent an analysis or maximum forecast for inundation extent. These include:

01. National Water Model [NWM] Latest Analysis FIM
02. River Forecast Center [RFC] 5-Day Maximum Forecast FIM
03. National Water Model [NWM] National Blend of Models [NBM] 5-Day Maximum Forecast FIM

### Considerations

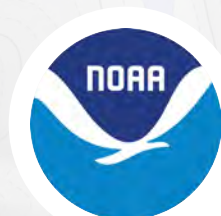
The NWM Latest Analysis FIM reflects an analysis of observed conditions, whereas the RFC 5-Day Maximum Forecast FIM and the NWM NBM 5-Day Maximum Forecast FIM provide forecast information. While these Dynamic FIM Services are distinct, the only true distinction lies in their flow data source. All three services use the same HAND-derived Relative Elevation Model [REM] grid, with outcomes contingent on the flow input. Therefore, any issue related to the underlying DEM data will reflect identically across services.



# National Water Model [NWM] Latest Analysis FIM

The National Water Model [NWM] Latest Analysis FIM service depicts the inundation extent of the NWM streamflow analysis where the NWM is signaling “High Water.” “High Water” is a term used by the Office of Water Prediction [OWP] as an indicator of elevated flows for a given NWM reach or stream. Its name refers to how this service uses observed data and assimilates it into modeled streamflow conditions which are then presented as the most recent FIM in delayed real-time. The NWM Latest Analysis FIM uses observed rainfall data as a base for modeling runoff for the Contiguous United States [CONUS]. Using real-time gage data, FIM is created to reflect and approximate what is currently occurring.

The NWM Latest Analysis FIM is not a forecast service and is therefore limited by the precision of its observed source data - Multi-Radar/Multi-Sensor System [MRMS] and the river gage network. The NWM Latest Analysis will be more reliable where there are more gages and less reliable farther away from river gages and where rainfall data [gage, radar, and satellite] are less accurate. It should be used when forecast information is not desired.



NWM  
Latest  
Analysis



RFC  
5-Day  
Max



NWM  
5-Day  
Max



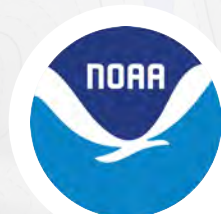
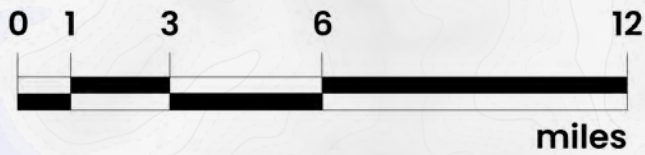
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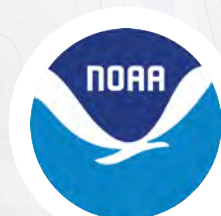
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## River Forecast Center [RFC] 5-Day Maximum Forecast FIM

The River Forecast Center [RFC] 5-Day Maximum Forecast FIM depicts the maximum inundation extent over the next five days, derived from the official RFC forecast routed downstream of a forecast gage location through the National Water Model [NWM] stream network. Forecasters at each RFC generate a Quantitative Precipitation Forecast [QPF] forecast several times daily. This QPF serves as the precipitation forcing in the Community Hydrologic Prediction System [CHPS], the modeling system used to produce the RFC streamflow forecasts for forecast points. The forecast flow from the RFC at a gage location is subsequently used to generate the 5-day Maximum Forecast FIM by routing the flow downstream through the NWM stream network. In total, this provides inundation services along approximately 110,000 river miles downstream of the about 3,600 RFC forecast points.

The RFC 5-Day Maximum Forecast FIM is only available downstream of NWPS forecast points. Because the RFC CHPS models are highly calibrated for a specific location, and a forecaster reviews the resulting forecasts, there is generally higher confidence in the flows used to produce RFC FIM than the NWM FIM. Therefore, use the RFC 5-Day Maximum Forecast FIM instead of the NWM Forecast FIM where it is available.



NWM  
Latest  
Analysis



RFC  
5-Day  
Max



NWM  
5-Day  
Max



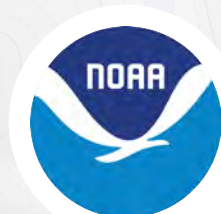
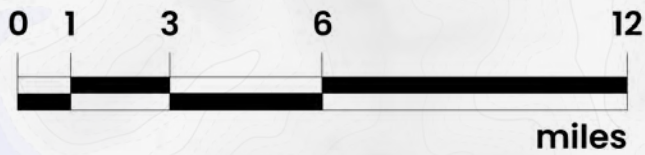
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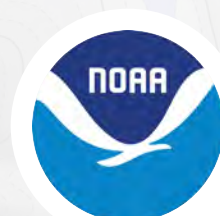
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# National Water Model [NWM] National Blend of Models [NBM] 5-Day Maximum Forecast FIM

The National Water Model [NWM] National Blend of Models [NBM] 5-Day Maximum Forecast FIM depicts the maximum inundation extent over the next five days derived from the NWM streamflow forecast. This FIM is only generated where and when the NWM is forecasting flows that meet or exceed the “High Water” threshold for a given river reach. This service is derived from the medium-range configuration of the NWM over the Contiguous United States [CONUS]. The NWM 5-Day Maximum Forecast FIM uses the NWM Latest Analysis FIM configuration as its initial conditions. The Medium Range run of the NWM ingests the National Blend of Models [NBM] rainfall forecast for the upcoming five days and runs it through a rainfall-runoff simulation to generate a flood forecast. The FIM depicted by this service represents the maximum extent of inundation during these five days.

Because a forecaster is not involved in the decision-making process regarding the forecast, a Quality Control [QC] limitation exists. Therefore, the RFC Forecast FIM is recommended where available downstream of NWPS forecast points. Use the NWM NBM 5-Day Maximum Forecast FIM for areas not covered by other services and have confidence in the NBM forcing.



NWM  
Latest  
Analysis



RFC  
5-Day  
Max



NWM  
5-Day  
Max



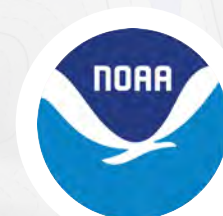
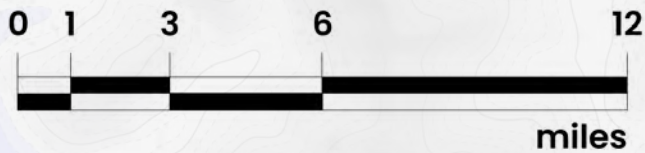
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## Dynamic FIM Services Comparison Table

FIM Service	NWM Latest Analysis FIM	RFC 5-Day Maximum Forecast FIM	NWM NBM 5-Day Maximum Forecast FIM
Data Type	Observation-Based Simulations [precipitation estimate and assimilated with USGS gage observations]	Forecast [5-day RFC forecasts]	Forecast [5-day NBM QPF]
Total Latency	55 Minutes	45 Minutes	6 Hours 30 Minutes
Update Frequency	Hourly	Hourly [if new forecasts are available]	Every 6 Hours
FIM Domain	NWM Domain for FIM 30%	Downstream of NWPS Forecast Points for FIM 30%	NWM Domain for FIM 30%
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

