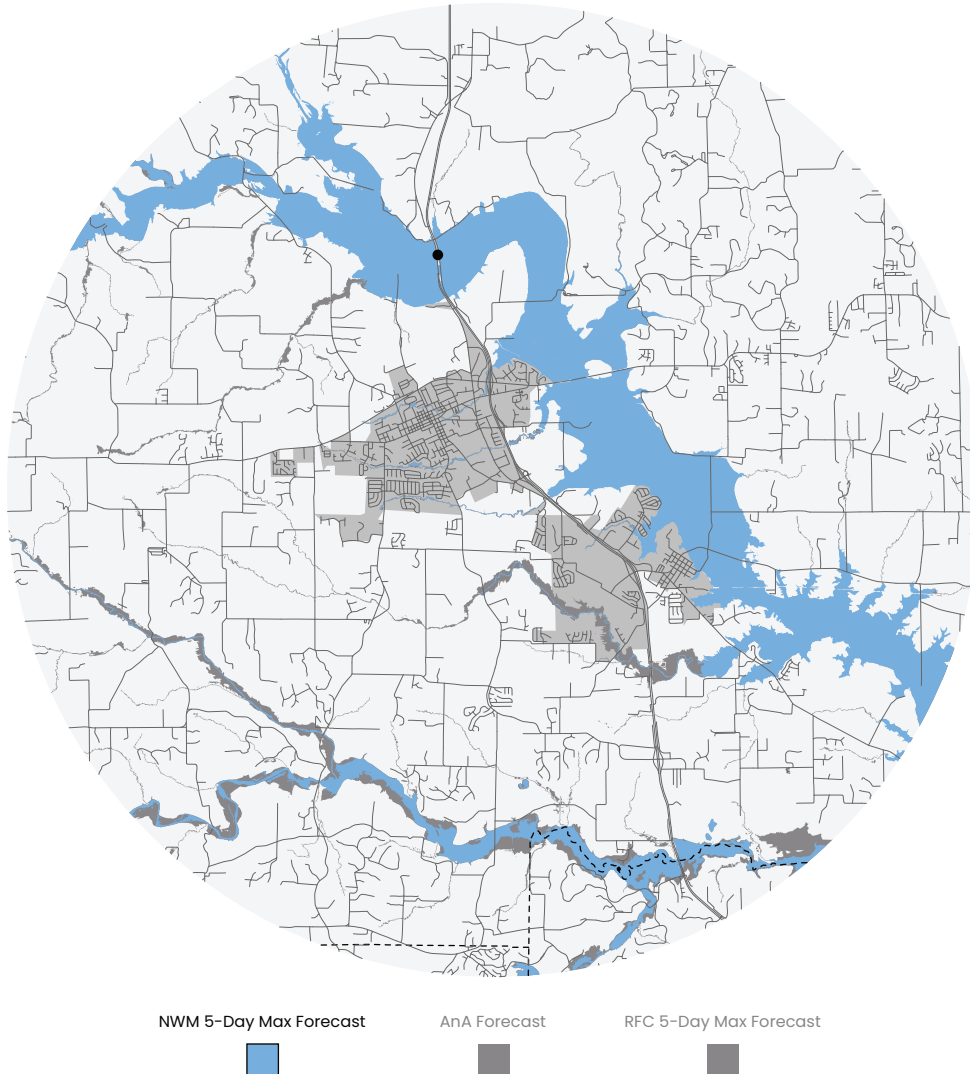


# National Water Model 5-Day Maximum Flood Inundation Mapping [NWM 5-Day Max FIM] Forecast Summary

## What is NWM 5-Day Max FIM Forecast?



NWM 5-Day Max FIM Forecast depicts the inundation extent of the peak National Water Model [NWM] streamflow forecast over the next 5 days where the NWM is producing 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 U.S., showing reaches with peak flow at or above high water thresholds. High water thresholds [which vary by region] and Annual Exceedance Probabilities [AEPs] are derived using the 40-year NWM v2.1 reanalysis simulation. NWM 5-Day Max FIM Forecast differs from NWM Analysis and Assimilation FIM in that it is a forecast FIM and does not depict flooding in real-time. While NWM 5-Day Max FIM Forecast is a forecast service like the RFC 5-Day Max FIM Forecast, it differs in that it is fully automated from rainfall to inundation mapping. It encompasses the total density of the stream network [3.4 million miles of streams], giving it the advantage of covering all of CONUS.

## How is NWM 5-Day Max FIM Forecast Obtained?

NWM 5-Day Max FIM Forecast uses the NWM Analysis and Assimilation FIM configuration as initial conditions. It ingests meteorological forcing data from the Global Forecast System [GFS] model, taking rainfall from GFS for the upcoming 5 days and running it through a rainfall-runoff simulation to create a flood forecast. The FIM depicted by this service represents the maximum extent of inundation during this 5-day period. This means that, unlike RFC 5-Day Max FIM Forecast, the human aspect is not present: there is no human decision-making because streamflow from rainfall is automatically computed to produce forecasted streamflow and FIM. The Quantitative Precipitation Forecast [QPF] forcing for each NWM 5-Day FIM Forecast comes from the GFS instead of the RFC QPF which forces the RFC 5-Day FIM forecasts. All analysis and forecast configurations benefit from including over 5,000 reservoirs, with the CONUS short- and medium-range forecasts ingesting RFC-supplied forecasts of reservoir outflow at several hundred locations.

### Limitations

Because a forecaster is not involved in the decision-making process regarding the forecast, a Quality Control [QC] limitation exists. Therefore, use the RFC FIM instead [if its limitations are mitigated], where available downstream of AHPS locations.

### When to Use NWM 5-Day Max FIM Forecast Service

Because NWM 5-Day Max FIM Forecast is available everywhere, not just downstream of AHPS sites, it is a good choice when looking at areas not covered by the RFC domain. NWM forecast FIM is also a valuable tool to communicate uncertainty and/or extremes in the rainfall forecast. E.g., "If it were to rain an inch over this watershed, the FIM extent could be as much as the NWM 5-day FIM Forecast. However, we believe the rainfall will not be that intense, and the FIM extent is more likely to match the RFC 5-day FIM Forecast.

### Considerations

While NWM ANA FIM, RFC 5-Day Max FIM Forecast, and NWM 5-Day Max FIM Forecast are all individual services, the only real difference is where the flows are coming from. For all three, the actual HAND model is the same; it just depends on what flow is fed into the HAND model. This means that if there's a problem with the DEM data in an area, it will show up in all three services in the exact same way.