What is NWM ANA FIM Service?

NWM 5-Day Max Forecast	AnA Forecast	RFC 5-Day Max Forecast
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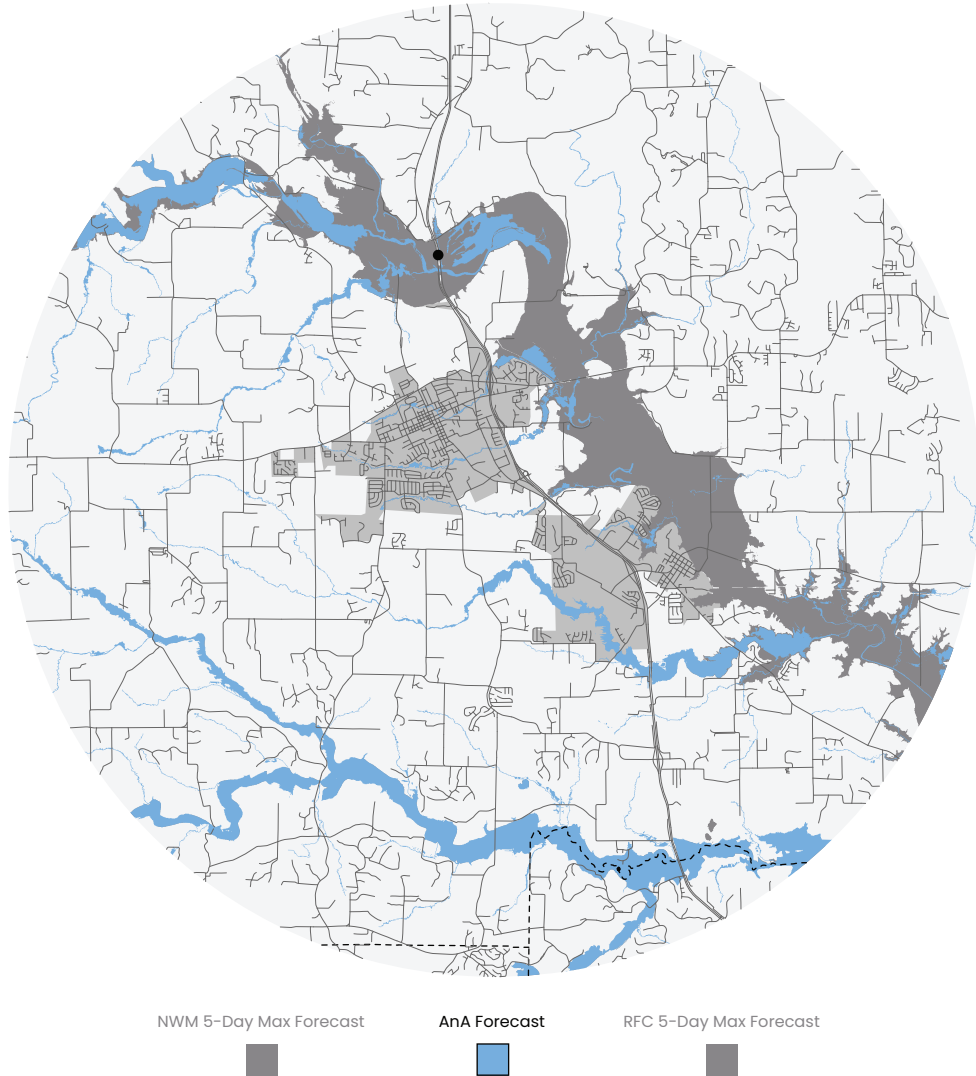
The NWM Analysis and Assimilation FIM depicts the inundation extent of the National Water Model streamflow forecast where the NWM is signaling high water and refers to how this service uses observed data and assimilates it into streamflow forecasts which are then reflected in the FIM in real-time. This service is derived from the analysis and assimilation configuration of the NWM over the contiguous U.S., showing reaches with the 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, which ran from 1979 to 2019.

How is NWM ANA FIM Obtained?

NWM ANA FIM uses observed rainfall data as a base for modeling runoff for the continental US. Where available, gage data is inserted into the Replace and Route model [which is used by the NWM to route streamflow downstream]. Using real-time gage data, FIM are created to reflect what's currently occurring. Meteorological forcing data are drawn from the MRMS [Multi-Radar/Muti-Sensor System] Gage-adjusted and Radar-only observed precipitation products along with short-range RAP [Rapid Refresh] and HRRR [High-Resolution Rapid Refresh]. At the same time, stream-gauge observations are assimilated from the USGS. 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

NWM ANA FIM is not a forecast service and is therefore limited by the precision of its observed source data [MRMS or the gage network]. It will be more reliable where there are more gages, less reliable the farther it gets away from gages, and less reliable where the radar and satellite data is less accurate.. Additionally, NWM ANA FIM can only be updated as quickly as real-time gage and radar/satellite data come in. There is a latency time of 1 hour and 20 minutes between the observed data and when the FIM is produced. This is because the NWM is run once per hour and, the extra 20 minutes comes from the update frequency of the gage/radar data.

When to Use NWM ANA FIM Service

Concerning IDSS, NWM ANA FIM is the closest available depiction of the current extent of flood waters in real time. When a user needs to know what is happening right now, keeping the limitations in mind, NWM ANA FIM is a good choice.

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.