Dynamic FIM Services
Factsheet - Alaska (Public Domain)

Dynamic Flood Inundation Mapping (FIM) Services provide near real-time and forecasted flood inundation maps, offering critical insights into potential flood risks across the United States. For Alaska, services are currently available for south central Alaska including Cook Inlet, Kenai Peninsula, Copper River and Prince William Sound Watersheds. These services leverage advanced models and real-time data to predict the extent of water overflow. Currently, there are four 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

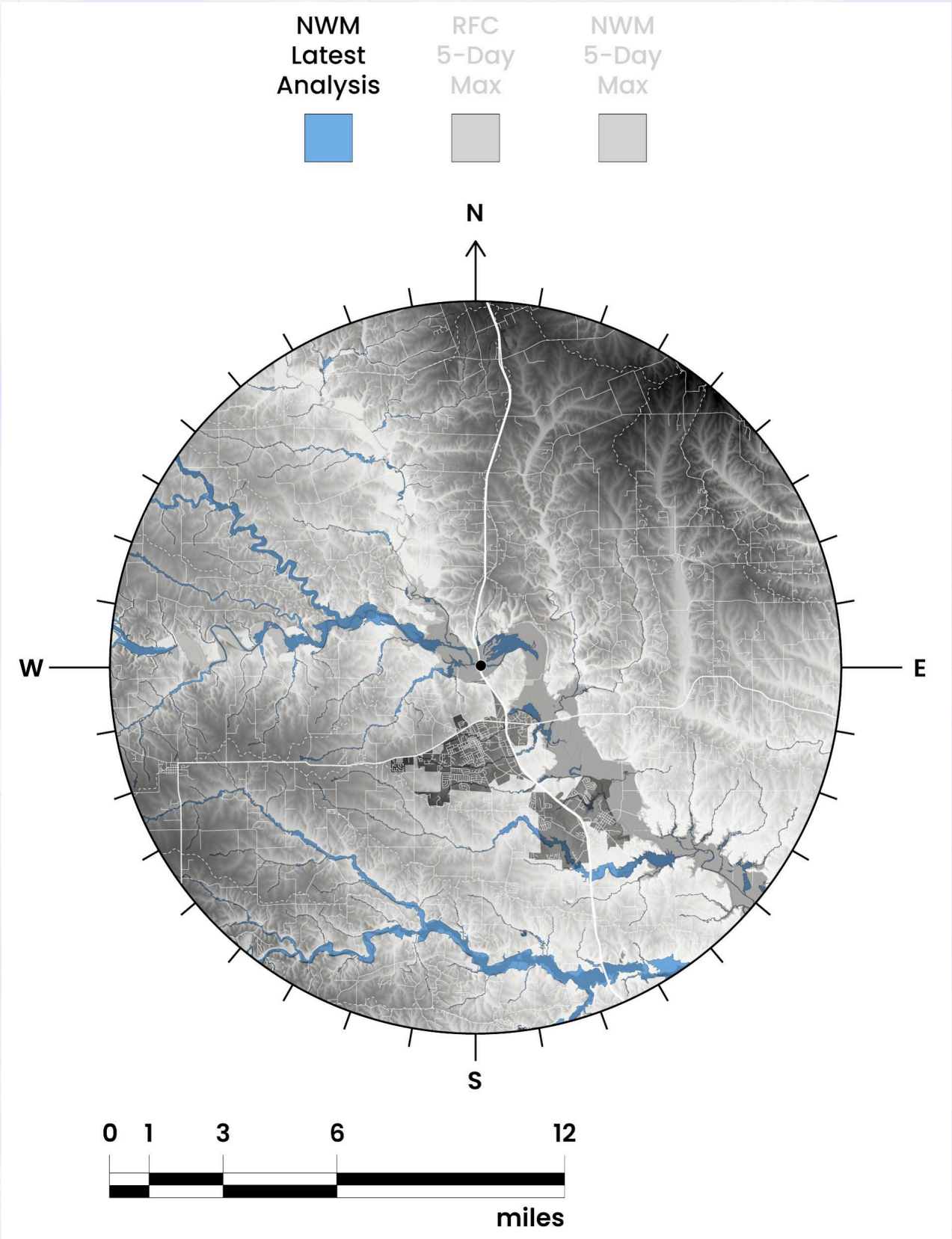
Considerations

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 Flood Inundation Mapping (FIM) depicts the extent of inundation based on the hourly NWM streamflow analysis and assimilation, specifically where the NWM signals "High Water." This service leverages observed data, assimilating it into the streamflow analysis and assimilation, which are then reflected in real-time on the FIM. The analysis and assimilation configuration of the NWM across south central Alaska identifies reaches with flow at or above "High Water" thresholds. These thresholds are based on the 2 year recurrence interval flow using USGS Bulletin 17C techniques as applied to the 39 year NWM reanalysis simulation.

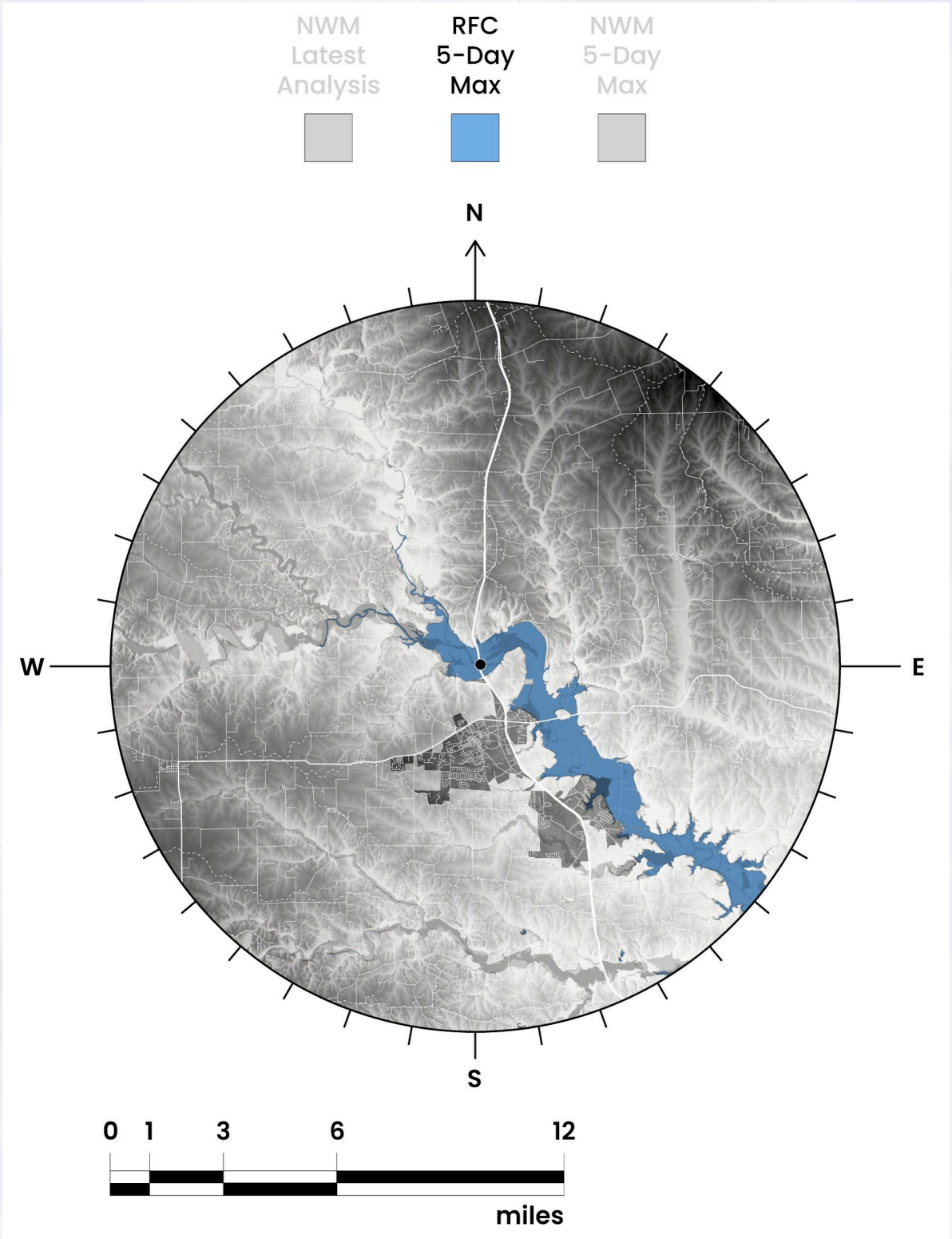
The NWM Latest Analysis FIM is not a forecast service and is therefore limited by the precision of its observed source data - Multi-Radar/Multi-Sensor System (MRMS) and the river gage network. The NWM Latest Analysis will be more reliable where there are more gages and less reliable farther away from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



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.

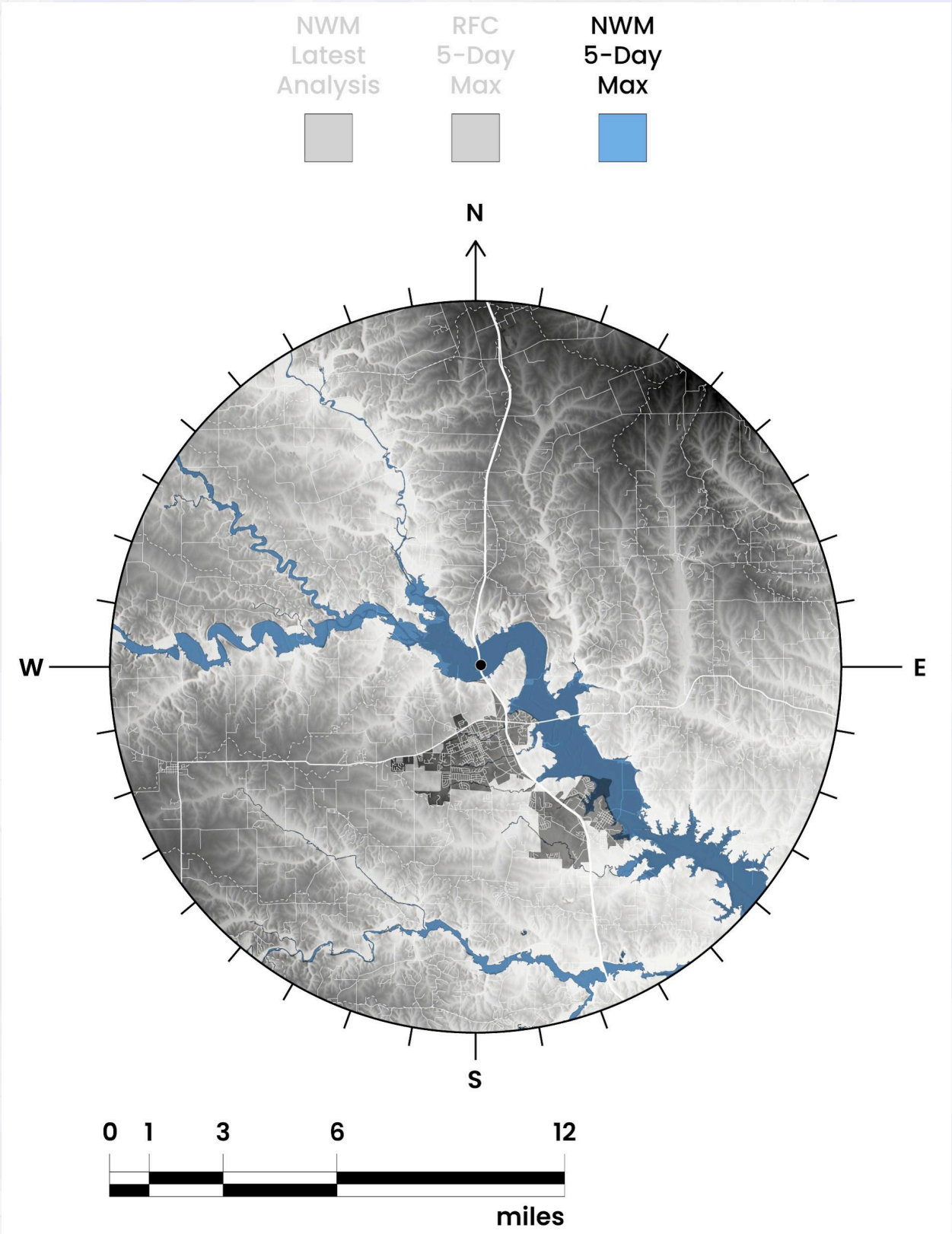
The RFC 5-Day Maximum Forecast FIM is only available downstream of NWPS forecast points. Because the RFC CHPS models are highly calibrated for a specific location, and a forecaster reviews the resulting forecasts, there is generally higher confidence in the flows used to produce RFC FIM than the NWM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



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 south central Alaska. The NWM 5-Day Maximum Forecast FIM uses the NWM Latest Analysis FIM configuration as its initial conditions. It ingests rainfall forcing data from the National Blend of Models (NBM) for the first 72 hours of the forecast and the GFS for the remainder of 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. The streamflow from rainfall is automatically computed to produce the forecasted streamflow and FIM. All analysis and forecast configurations benefit from incorporating over 5,000 reservoirs, with the CONUS short and medium-range forecasts also ingesting RFC-supplied forecasts of reservoir outflows at several hundred locations. 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.



Dynamic FIM Services Comparison Table - Alaska (Public Domain)

FIM Service	NWM Latest Analysis FIM	RFC 5-Day Maximum Forecast FIM	5-Day NBM Maximum Forecast FIM
Data Type	Observation-Based Simulations (precipitation estimate and USGS gage observations)	Forecast (5-day RFC forecasts)	NBM QPF out to 72 Hours GFS QPF 73-240 Hours
Total Latency	30 Minutes	45 Minutes	5 Hours 30 Minutes
Update Frequency	Hourly	Hourly (if new forecasts available)	Every 6 Hours
FIM Domain	Cook Inlet, Kenai Peninsula, Copper River and Prince William Sound Watersheds	Downstream of NWPS Forecast Points	Cook Inlet, Kenai Peninsula, Copper River and Prince William Sound Watersheds
When to Use	Use as snapshot of most recent modeled inundation	Use when RFC forecast is available	Use for rivers & streams not covered by RFC forecast