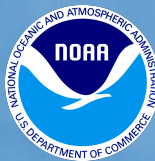


Using the National Water Prediction Service (NWPS) Website to Leverage Flood Inundation Mapping (FIM) Services

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15th Conference On Transition Of Research To Operations at the 105th AMS Annual Meeting
January 15th, 2025



Topics Covered

- NWPS and FIM Background
- FIM Public Products
- Using NWPS to View FIM Products

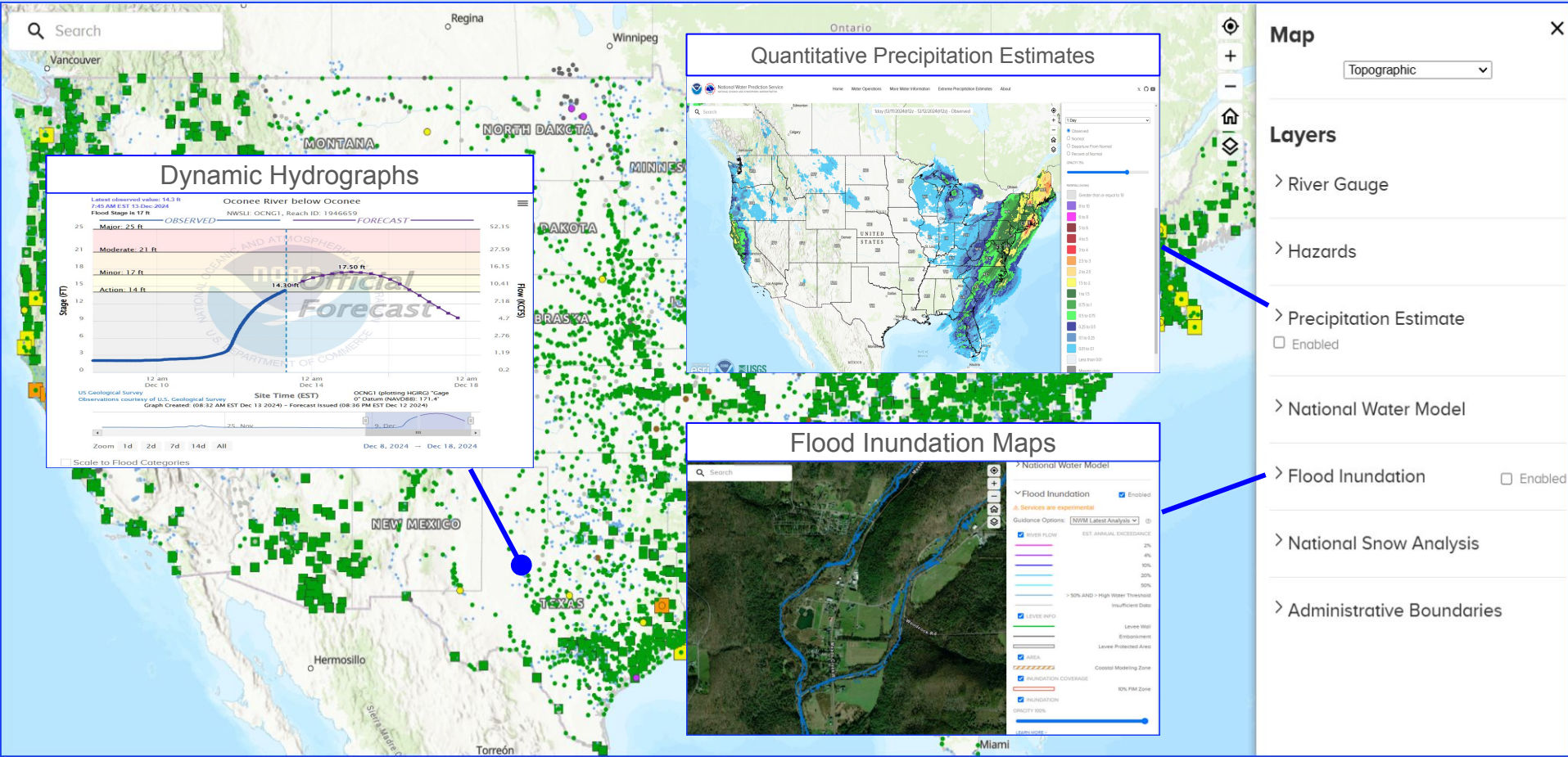


The National Water Prediction Service (NWPS)

- Replaced AHPS (water.weather.gov) Spring 2024
- New gateway for NWS Hydrologic products, forecasts and services
- Features
 - Expanded map displays
 - Improved visualization of River Gauges
 - Quantitative Precipitation Estimates (QPE)
 - Enhanced hydrograph controls of time period (legacy hydrographs still available)
 - Clickable map overlay of NWS hazards (watch, warning, advisory)
 - National Water Model (NWM) access - 3.4M miles from NHDplus network
 - Application Programming Interface (API)- suite of data services to access source data
 - Flood Inundation Maps (FIM)



NWPS Capabilities water.noaa.gov



Flood Inundation Mapping (FIM)

“Neighborhood Level” maps of modeled inundated areas

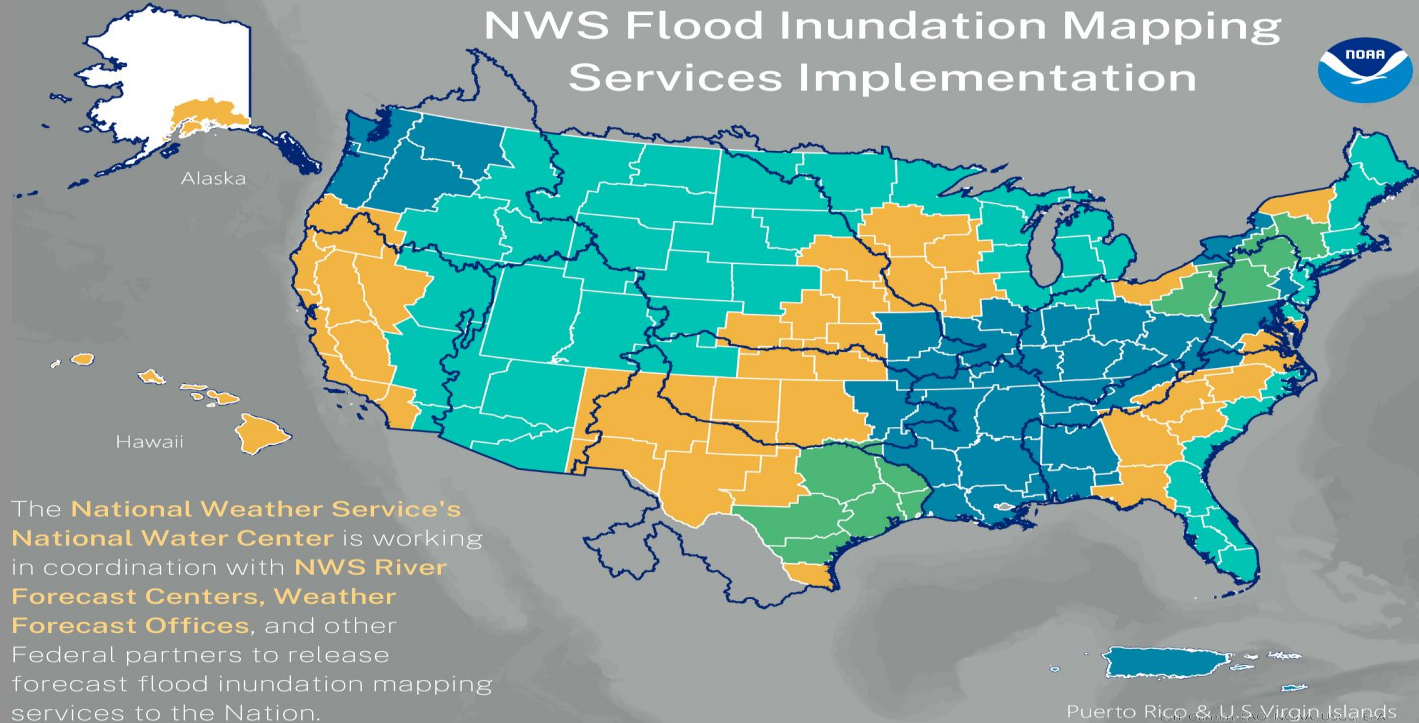
Map Legend



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.



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Real Time Event FIM Products in NWPS

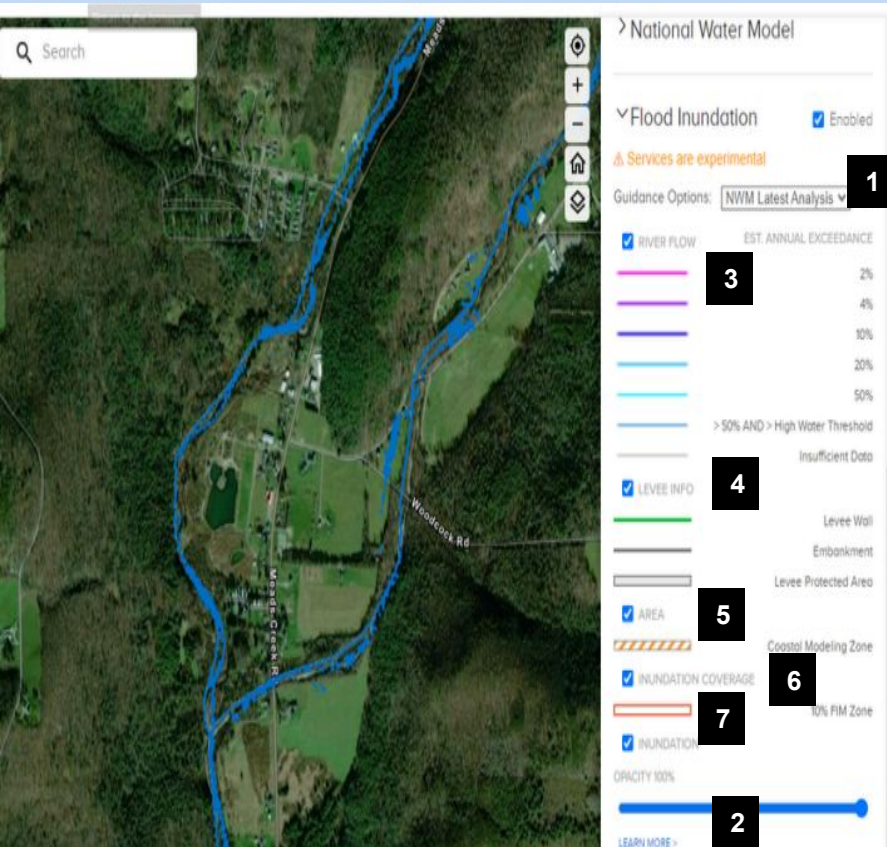
NWM Latest Analysis	RFC 5-Day Max Forecast	NWM 5-Day Max Forecast	NWM 48-Hour Max Forecast PR/USVI
<ul style="list-style-type: none"> Depicts the extent of inundation in the National Water Model (NWM) streamflow analysis, where the NWM signals “high water”. Updated Hourly To be used as a snapshot of the most recent modeled flooding 	<ul style="list-style-type: none"> Based on up to 5-day RFC Forecasts Updated with new RFC river forecasts Only for river reaches near NWPS forecast locations To be used where and when an RFC forecast is available Generated when an RFC reaches “action stage” 	<ul style="list-style-type: none"> Based on 5-day weather forecast from the National Blend of Models Updated every 6 hours To be used for rivers and streams not covered by RFC forecasts Generated only where NWM forecast indicates flows exceed the high flow threshold 	<ul style="list-style-type: none"> Based on the 48-hour weather forecast Updated twice a day Generated where the NWM forecast indicates flows exceed the high flow threshold



Scenario-based FIM Products Available in NWPS

Categorical Flood Inundation Extent (CatFIM)	Partner FIM
<ul style="list-style-type: none">• Depicts the inundation extent at 1-foot increments using Stage-based Categorical Flood Inundation Mapping• Static map extents available for action, minor, moderate, major and record levels.• Available at select NWS river forecast points• Represent scenarios via static libraries, not based on an actual forecast• Can be used for planning before floods, or evaluating scenarios when flooding is forecast or occurring	<ul style="list-style-type: none">• Graphical representation of flood inundation for NWS flood categories are based on steady state hydraulic modeling of water surface elevations for incremented discharges• Map shows approximate inundation areas for given water surface elevations• Available at a limited number of river forecast points

Displaying FIM from the NWPS Flood Inundation Menu



- Select “Guidance Option” (1)
- Zoom in on area of choice until FIM extent begins to appear. Users can adjust the opacity on the slider bar (2)
- User can toggle on/off FIM display options:
 - **River Flow** - Shows NWM estimated Annual Exceedance Probability (AEP) (3)
 - **Levee Info** - Displays levee wall, embankments, and protected areas as defined in the USACE National Levee Database (4)
 - **Area/Coastal Modelling Zone** - Displays the 10-meter elevation contour above the NAVD88 datum, indicating areas where caution is needed in interpreting flood inundation due to coastal processes. (5)
 - **Inundation Coverage** - Displays regions in the U.S. that have experimental National Water Center FIM products available (currently ~30% of U.S., including areas in the Ohio and Mississippi River valleys, the mid Atlantic, the Pacific Northwest, Puerto Rico, and the Virgin Islands). (6)
 - **Inundation** - Allows users to toggle the selected guidance inundation layer on or off. (7)

Using Categorical FIM on NWPS

“Categorical” FIM (CatFIM) maps are available for select NWS River Forecast Points within the FIM domain on NWPS. CatFIM is a method developed by the National Water Center to create a static (scenario based, not event specific) inundation extent mapping library for the official NWS flood stage category thresholds [Action, Minor, Moderate, Major, and Record].

To access CatFIM on NWPS:

1. Choose gauge of choice
2. Click “Full Information” at the top of hydrograph side menu. This will open in a new tab
3. Scroll down to the “Gauge Location” section
4. Below the map are several check boxes and an opacity slider. Click “Activate [gauge] CATFIM” box to enable all threshold layers.
5. Threshold layers can be toggled on/off

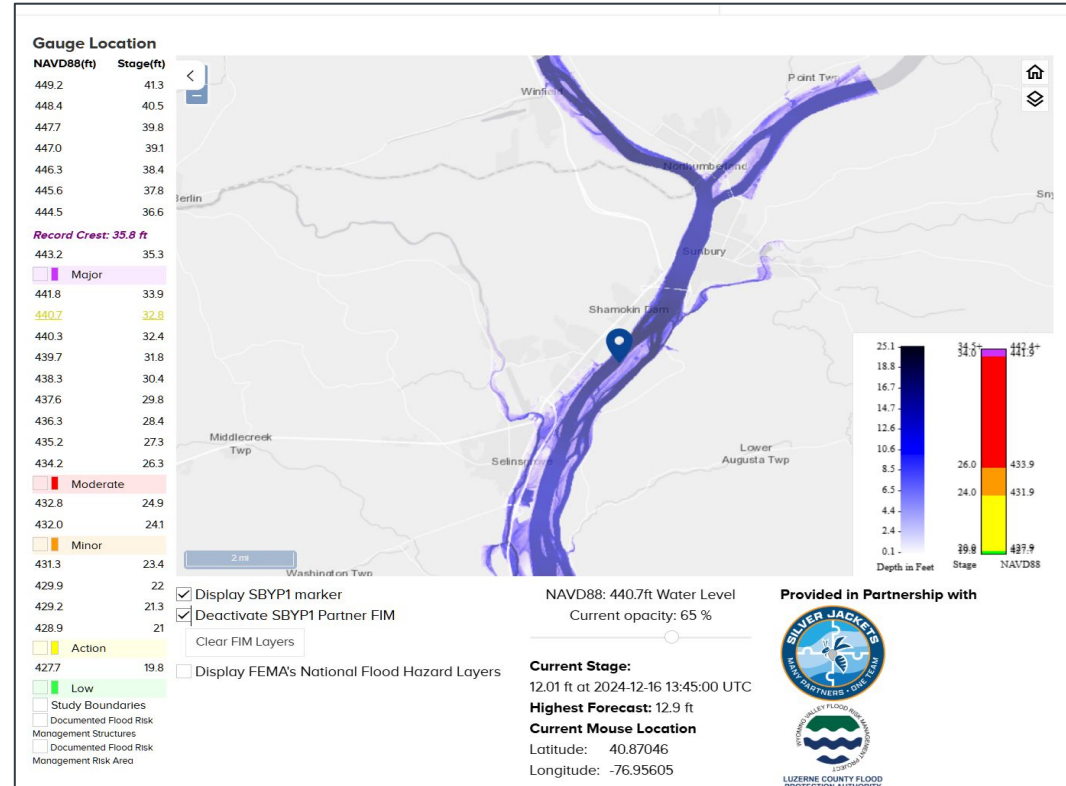
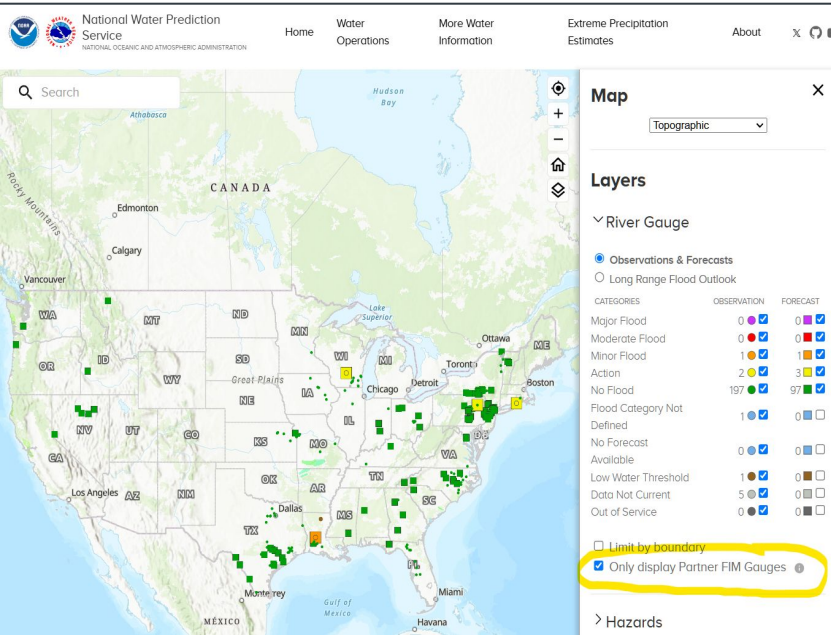
A list of river gauges with CatFIM is also available here:

<https://water.noaa.gov/about/cat-fim-locations>



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Partner FIM Locations



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FIM REST Services

All public FIM Products are available as Representational State Transfer Services, or REST Services.

FIM REST Services

1. NWM Latest Analysis

- CONUS:
https://maps.water.noaa.gov/server/rest/services/nwm/ana_inundation_extent/MapServer
- Puerto Rico / USVI
https://maps.water.noaa.gov/server/rest/services/nwm/ana_inundation_extent_prvi/MapServer

1. RFC 5-Day Max Forecast

- https://maps.water.noaa.gov/server/rest/services/rfc/rfc_based_5day_max_inundation_extent/MapServer

2. NWM 5-Day Max Forecast

- https://maps.water.noaa.gov/server/rest/services/nwm/mrf_nbm_5day_max_inundation_extent/MapServer

3. NWM 48-Hour Max Forecast for PR/USVI

- https://maps.water.noaa.gov/server/rest/services/nwm/srf_48hr_max_inundation_extent_prvi/MapServer

4. CatFIM

- https://maps.water.noaa.gov/server/rest/services/fim_libs/static_stage_based_catfim/MapServer

5. Partner FIM

- https://maps.services.weather.noaa.gov/static/rest/services/NWS_FIM

ArcGIS REST Services Directory

Login

Home > services > nwm > mrf_nbm_5day_max_inundation_extent (MapServer)

API Reference

JSON | SOAP | WMS | WFS

nwm/mrf_nbm_5day_max_inundation_extent (MapServer)

View In: [ArcGIS JavaScript](#) [ArcGIS Online Map Viewer](#) [ArcGIS Earth](#) [ArcGIS Pro](#)

Service Description:

*****THIS IS AN EXPERIMENTAL SERVICE*****

This experimental map represents the National Weather Service's best approximation of inundation extent based upon modeled river discharge.

The map depicts the inundation extent of the peak National Water Model (NWM) streamflow forecast over the next 5 days where the NWM is signalling high water. This service is derived from the medium-range NBM configuration of the NWM for an area that includes 30% of the U.S. population but will be expanded later as described in the Story Map below.

<https://storymaps.arcgis.com/stories/c7ae842207241b5873fff38a22cf66b>

Boundary of 30% Area: https://maps.water.noaa.gov/server/rest/services/reference/static_public_fim_domain/MapServer

Shown are sections of river with flow at or above a predetermined high water threshold as depicted in the following service:

https://maps.water.noaa.gov/server/rest/services/nwm/ana_high_flow_magnitude/MapServer

High water thresholds (regionally varied) and Annual Exceedance Probabilities (AEPs) are derived using the 40-year NWM reanalysis simulation which is available via the NOAA Open Data Dissemination Program (NODD). Forecast inundation extents do not fully capture coastal processes. The service below depicts the boundary of this coastal area.

https://maps.water.noaa.gov/server/rest/services/reference/static_nwm_coastal_domain_noaa/MapServer

This service is updated every 6 hours.

For more information on the expansion of National Weather Service (NWS) flood inundation mapping capabilities, please visit <https://www.weather.gov/owp/operations>. For information about the NWM, please visit <https://water.noaa.gov>.

The NWS is accepting comments and feedback on the expansion of NWS flood inundation mapping capabilities. Please visit https://www.surveymonkey.com/r/ExpFIMServices_2023 to provide feedback.

The NWS is accepting comments through December 31, 2022 on the Experimental NWC Visualization Services. This service is one of many Experimental NWC Visualization Services. Please provide feedback on the Experimental NWC Visualization Services at: https://www.surveymonkey.com/r/Exp_NWCVisSvc_2022

Link to graphical web page: <https://www.weather.gov/owp/operations>

Link to data download (shapefile): TBD

Link to metadata: https://nws.weather.gov/products/PDD/SDD_ExpNWCVisualizationServices_2022.pdf

Map Name: NWM Medium-Range Max FIM Extent Forecast



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Summary

- NWPS is our new gateway for NWS Hydrologic products, forecasts and services
- Flood inundation services are a major component of the NWS flood program moving forward
- This talk described the FIM products that are publicly available



Thank You / Questions

Scan the QR Codes to view FIM Fact Sheets



Puerto Rico / U.S.
Virgin Islands



Dynamic FIM
Services Factsheet



Dynamic FIM
Services
Comparison Table

Contact Charles



Links to NWS Hydrologic Services



NWC Operations Page



NWS National GIS Viewer



HydroVIS Cloud System



NWPS

