

NWS Flood Service Updates NWPS and NWS FIM

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National Weather Service Pittsburgh



WV Floodplain Managers Conference 2025

Updated NWS River Webpage

National Water Prediction Service

National site:

<https://water.noaa.gov>

NWS Pittsburgh site:

water.noaa.gov/wfo/pbz

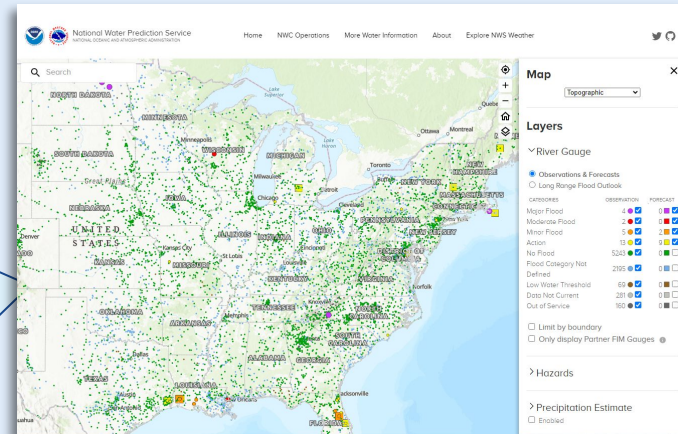
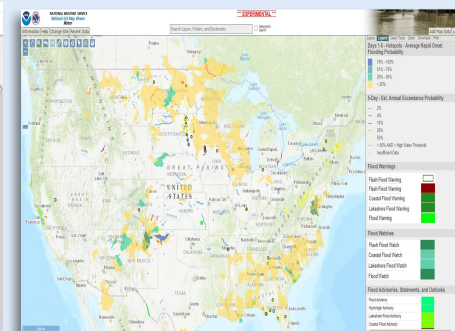
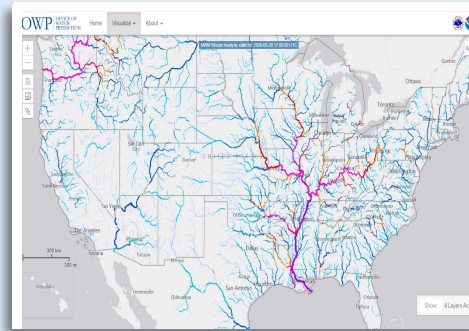
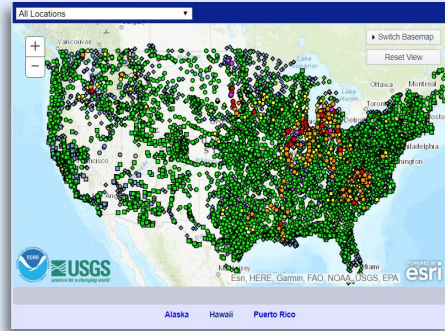
NWS Charleston site:

water.noaa.gov/wfo/rlx

State page example:

<https://water.noaa.gov/state/wv>

*Combines official NWS River Forecasts +
National Water Model simulations +
GIS layers/REST data*



Parts of the NWPS Website

Map Display:

- River Gages
- Weather-related Hazards
- Precipitation Estimates
- Flood Inundation Mapping (FIM)
- National Snow Analysis

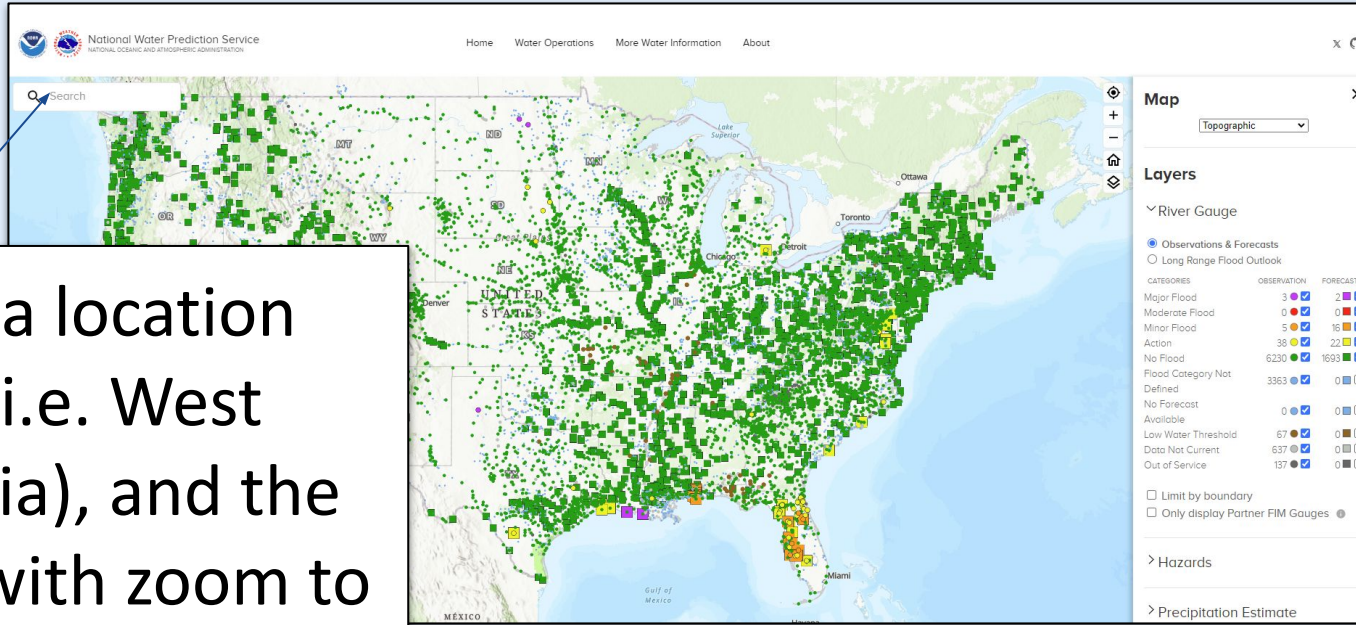
Detailed River Gage Pages

Part 1:

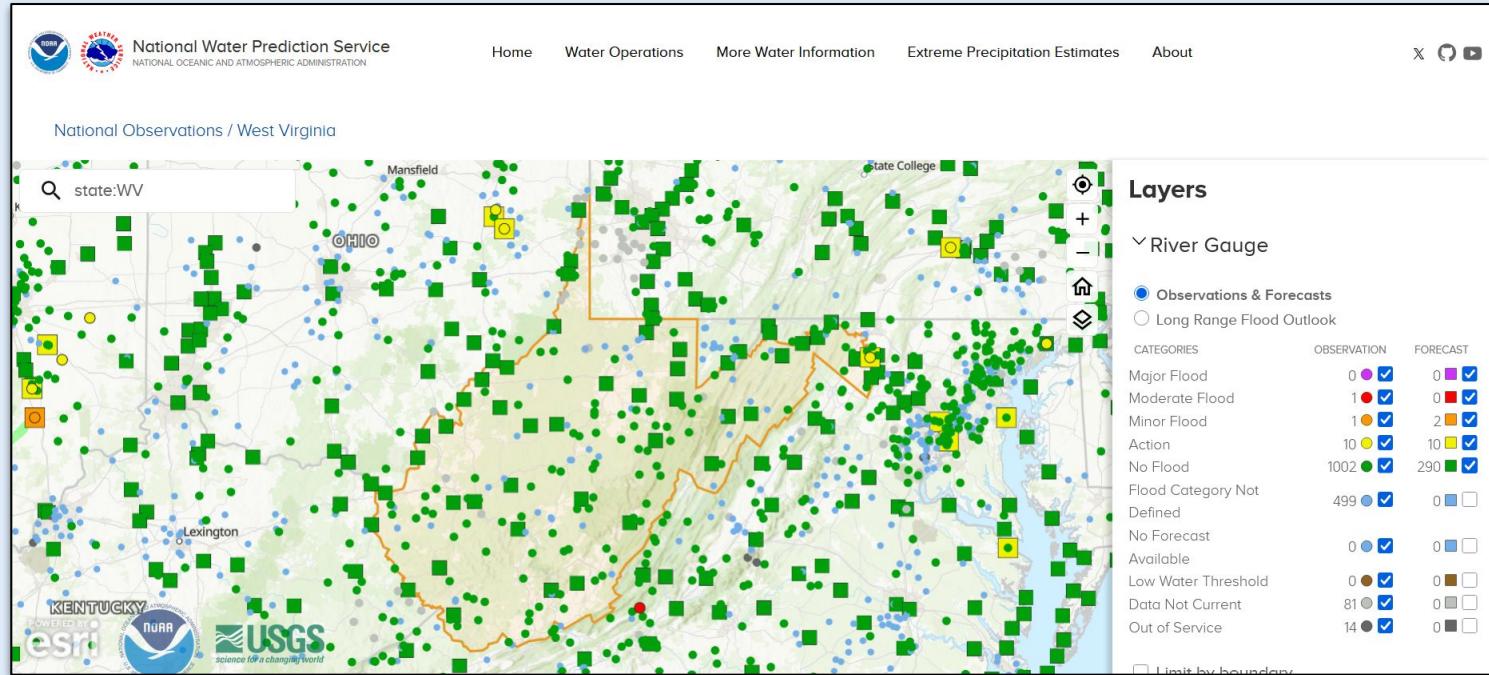
NWPS Map Display

National Water Prediction Service (NWPS)

Enter a location here (i.e. West Virginia), and the map will zoom to that location

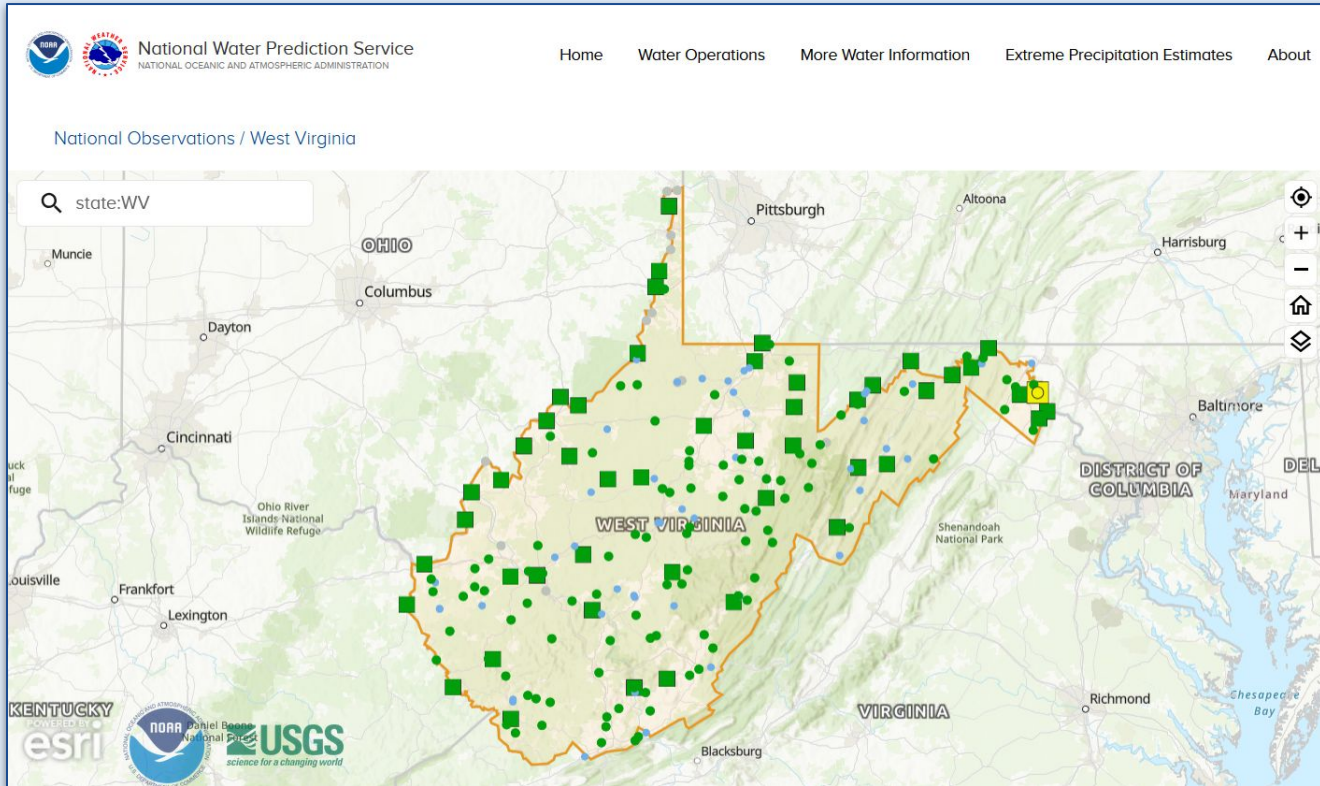


Zoom to West Virginia



The area of interest is now outlined in orange and shaded.

Limit display to only gages in West Virginia



Map

Topographic

Layers

✓ River Gauge

☒ Observations & Forecasts
☐ Long Range Flood Outlook

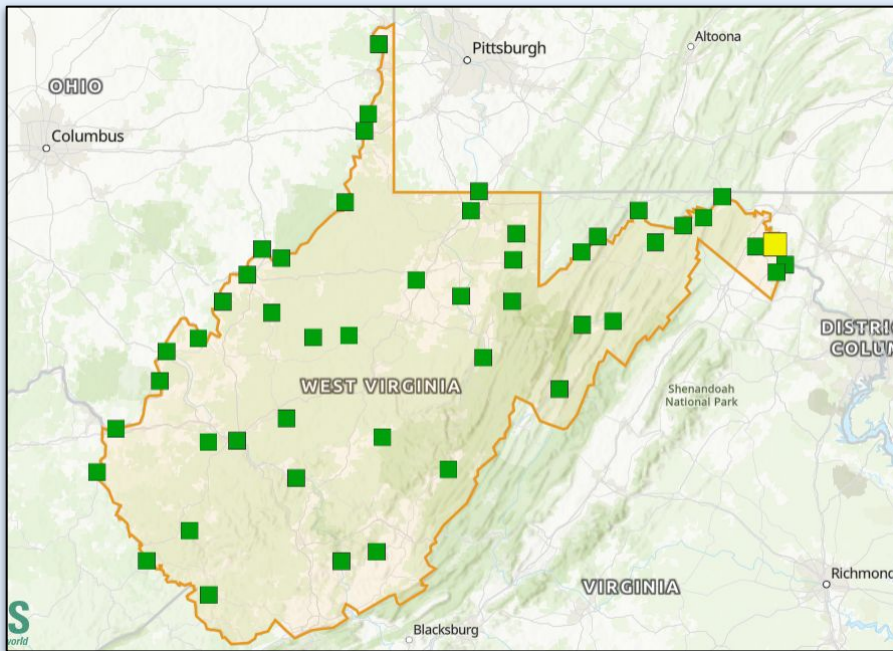
CATEGORIES	OBSERVATION	FORECAST
Major Flood	0 <input checked="" type="checkbox"/>	0 <input checked="" type="checkbox"/>
Moderate Flood	0 <input checked="" type="checkbox"/>	0 <input checked="" type="checkbox"/>
Minor Flood	0 <input checked="" type="checkbox"/>	0 <input checked="" type="checkbox"/>
Action	0 <input checked="" type="checkbox"/>	0 <input checked="" type="checkbox"/>
No Flood	213 <input checked="" type="checkbox"/>	101 <input checked="" type="checkbox"/>
Flood Category Not Defined	121 <input checked="" type="checkbox"/>	0 <input type="checkbox"/>
No Forecast Available	0 <input checked="" type="checkbox"/>	0 <input type="checkbox"/>
Low Water Threshold	1 <input checked="" type="checkbox"/>	0 <input type="checkbox"/>
Data Not Current	26 <input checked="" type="checkbox"/>	0 <input type="checkbox"/>
Out of Service	4 <input checked="" type="checkbox"/>	0 <input type="checkbox"/>

☒ Limit by boundary

☐ Only display Partner FIM Gauges ⓘ

Display or Hide Gages by Category

You can click the checkboxes to turn each category on or off.



Map ✕

Topographic ▼

Layers

▼ River Gauge

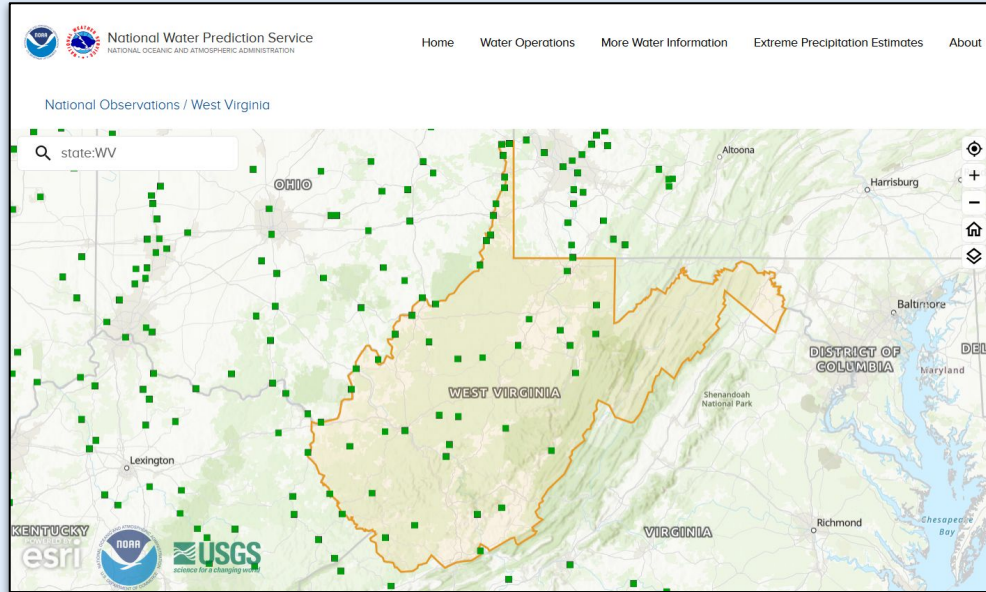
☒ Observations & Forecasts
☐ Long Range Flood Outlook

CATEGORIES	OBSERVATION	FORECAST
Major Flood	0 <input type="checkbox"/>	0 <input checked="" type="checkbox"/>
Moderate Flood	0 <input type="checkbox"/>	0 <input checked="" type="checkbox"/>
Minor Flood	0 <input type="checkbox"/>	0 <input checked="" type="checkbox"/>
Action	0 <input type="checkbox"/>	0 <input checked="" type="checkbox"/>
No Flood	0 <input type="checkbox"/>	101 <input checked="" type="checkbox"/>
Flood Category Not Defined	0 <input type="checkbox"/>	0 <input type="checkbox"/>
No Forecast Available	0 <input type="checkbox"/>	0 <input type="checkbox"/>
Low Water Threshold	0 <input type="checkbox"/>	0 <input type="checkbox"/>
Data Not Current	0 <input type="checkbox"/>	0 <input type="checkbox"/>
Out of Service	0 <input type="checkbox"/>	0 <input type="checkbox"/>

☒ Limit by boundary
☐ Only display Partner FIM Gauges ⓘ

You can also click the header (Observation or Forecast) to turn off/on all Observations and Forecasts

Long Range Flood Outlook



The Long Range Outlook defaults to the 50% chance of exceeding river flood levels at each gage site.

Layers

▼ River Gauge

☐ Observations & Forecasts

☒ Long Range Flood Outlook

50% ▼ or greater chance of exceeding river flood levels:

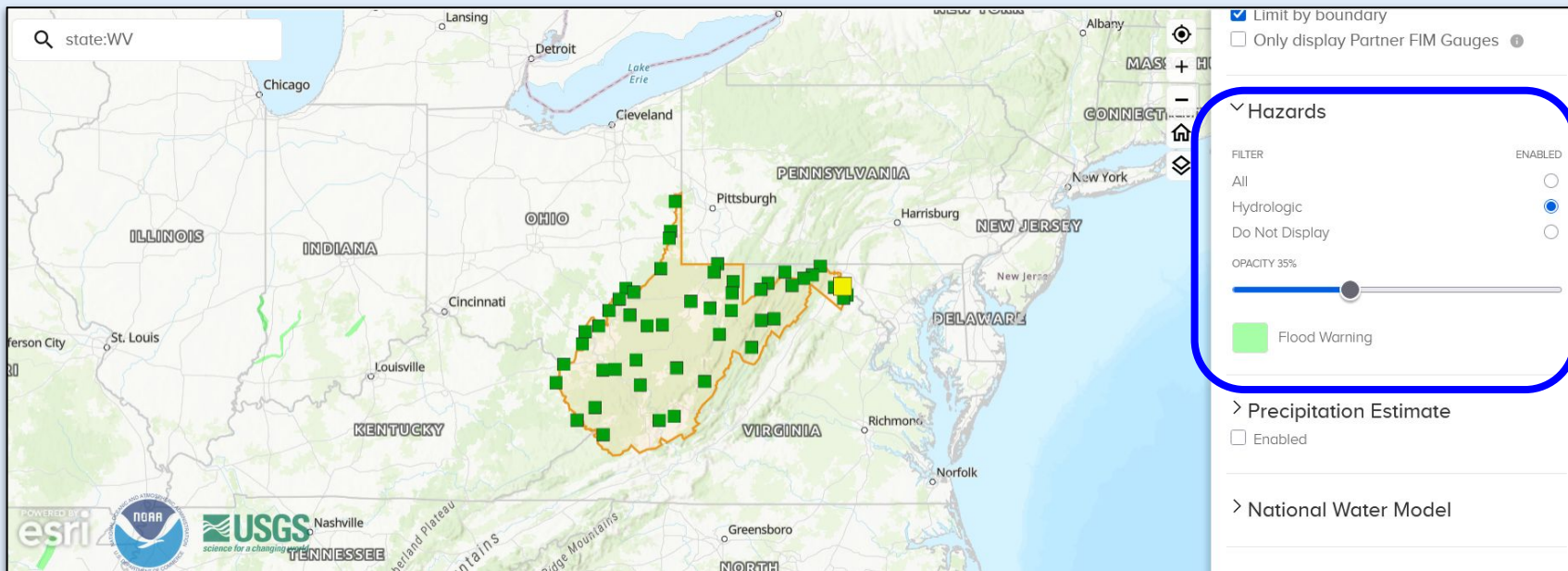
- 0 > Major ☒
- 0 > Moderate ☒
- 0 > Minor ☒
- 104 <= No Flooding ☒
- 0 Unavailable ☐

☒ Limit by boundary

☐ Only display Partner FIM Gauges ⓘ

Click the toggle to show the Long Range Flood Outlook

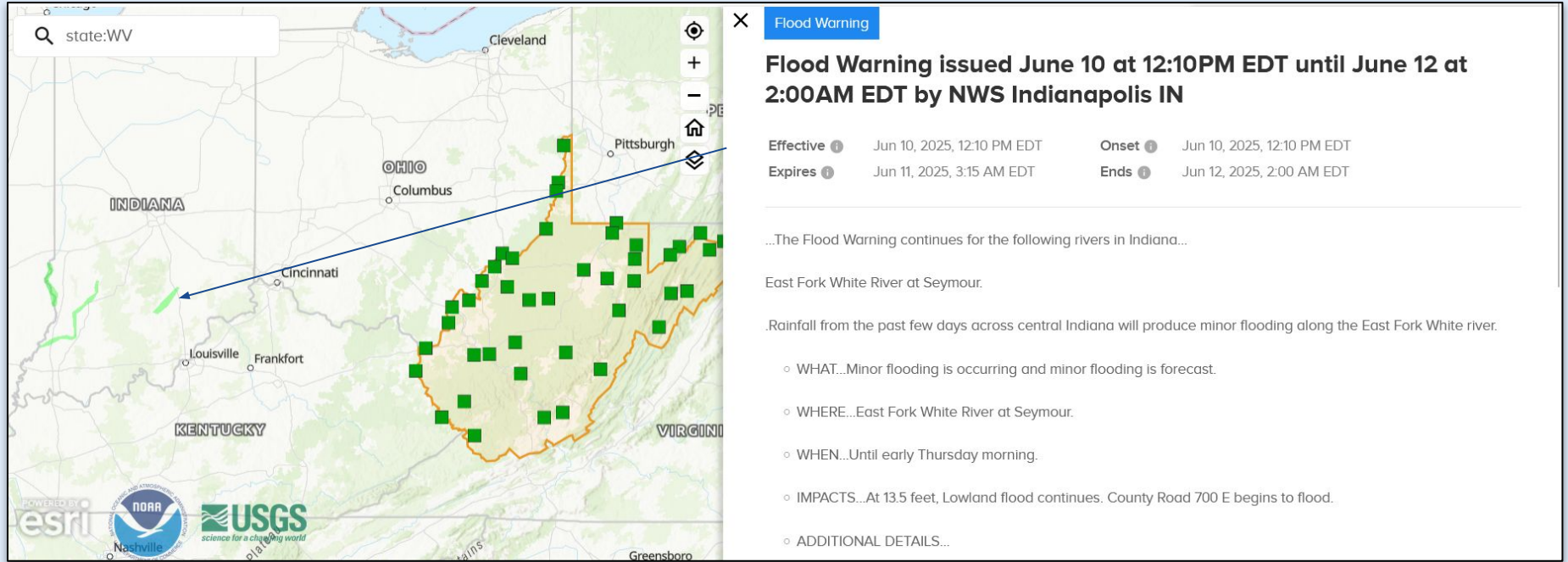
Hazards



By default, NWPS shows Hydrologic Hazards.

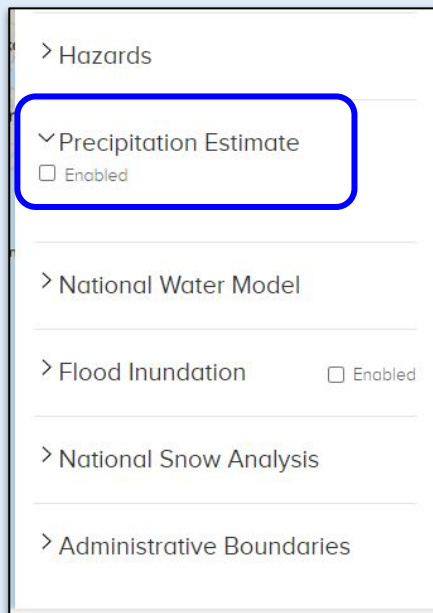
Users can also opt to show all hazards, or no hazards.

Hazards (Cont.)



If you click on a hazard, the statement will appear on the right side of your screen.

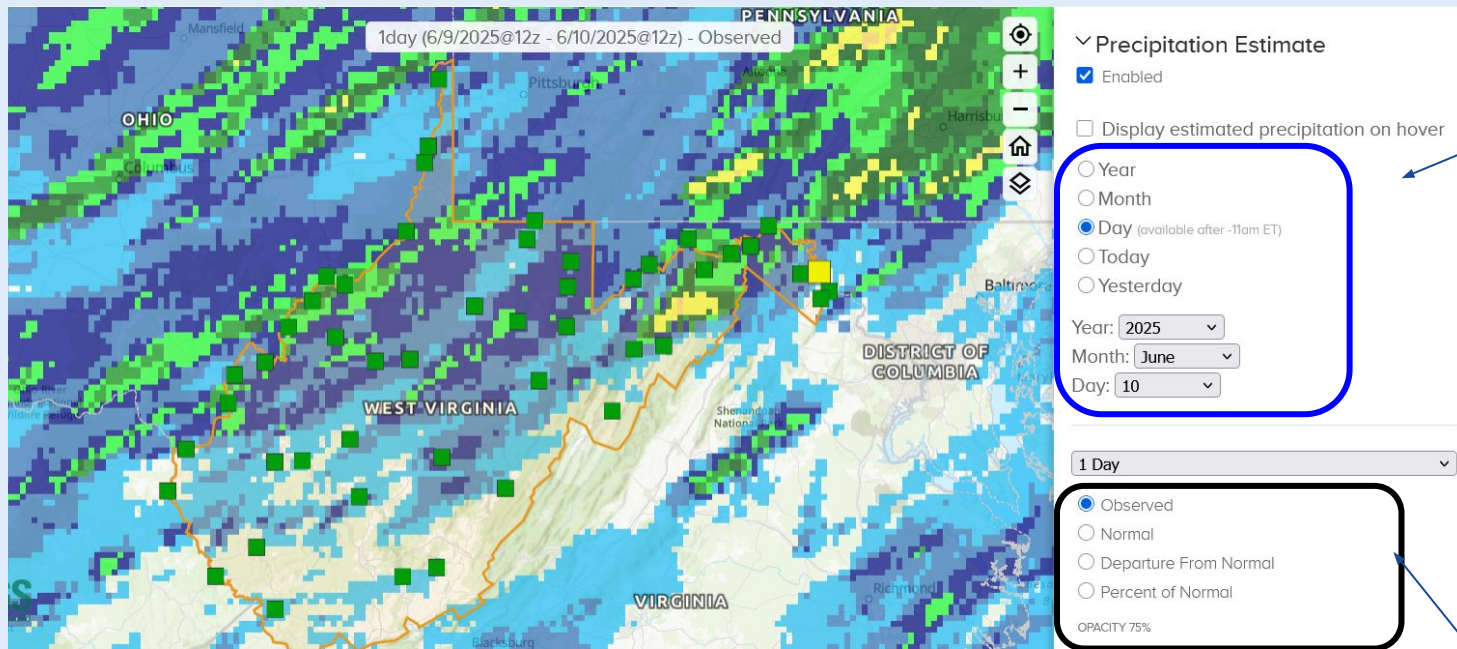
Precipitation Estimate



By default, Precipitation Estimate is disabled.

Click the box to enable it, and you will see the gridded multisensor precipitation data from the River Forecast Centers.

Precipitation Estimate

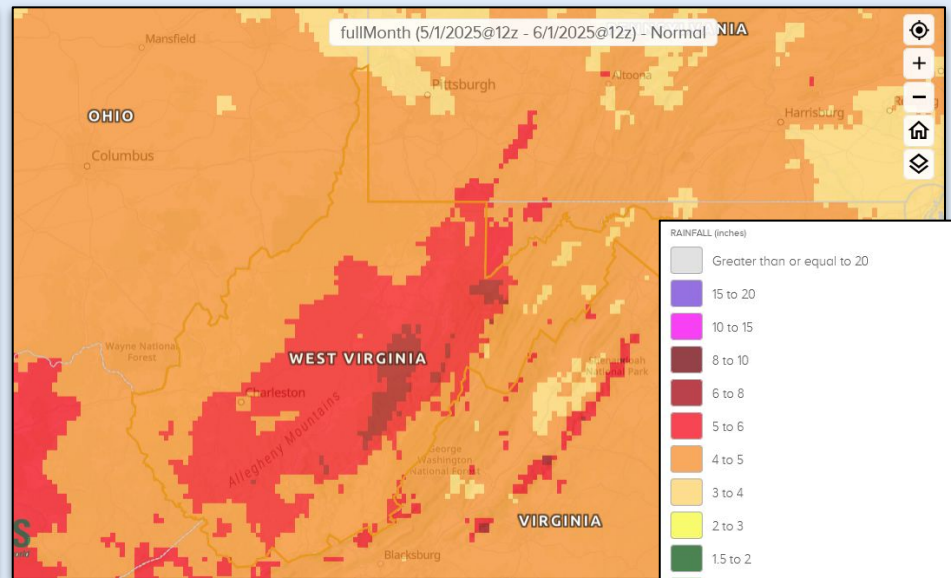
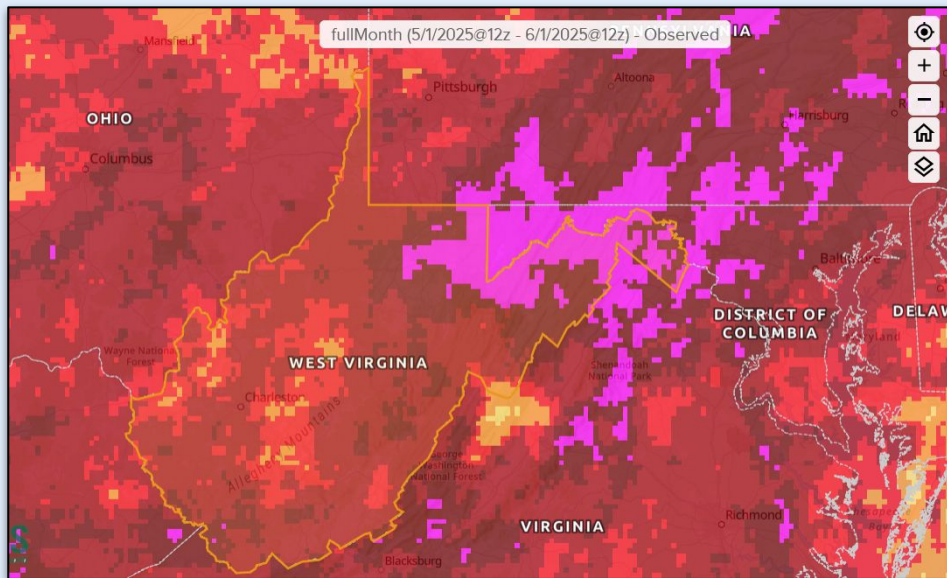


Change
time period
here

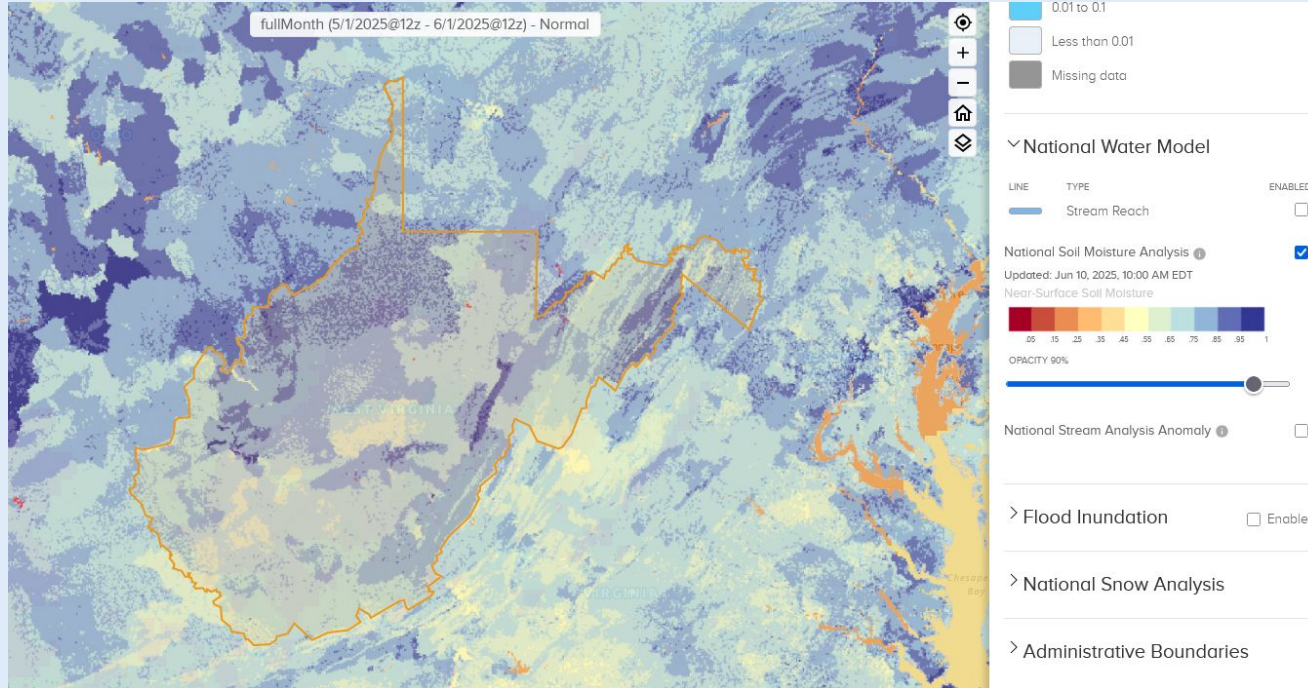
Change to
observed,
normal
precipitation,
or departure
from normal

Precipitation Data for the past hydrologic day
(7am to 7am EST or 8am to 8am EDT)

May Observed vs Normal Precipitation

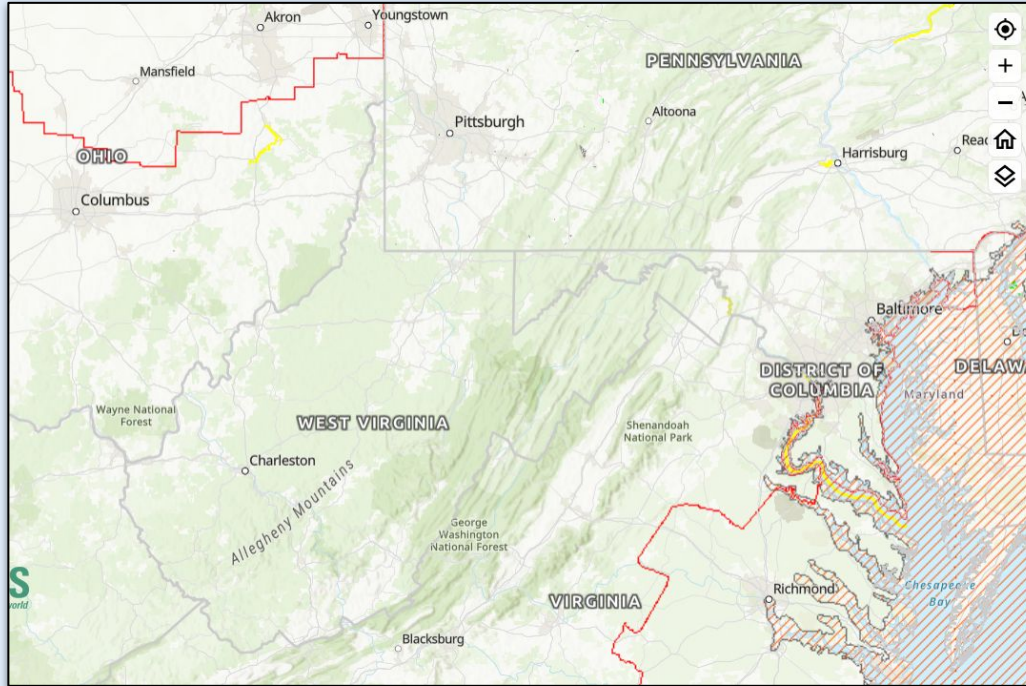


National Water Model (NWM) Data

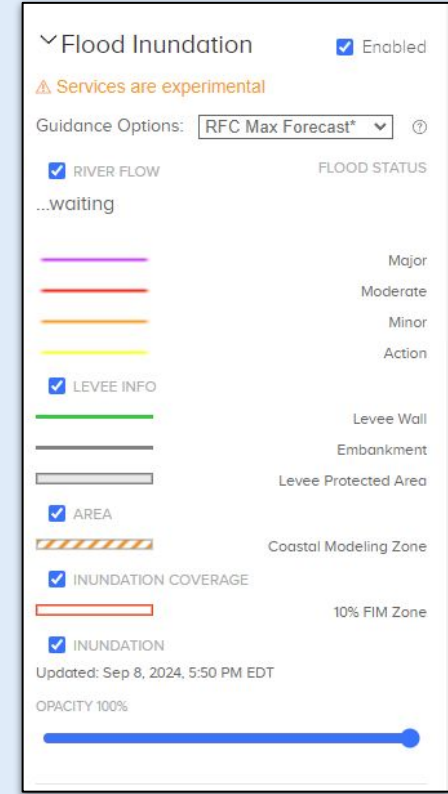


User can display the NWM Stream Reaches, Soil Moisture Analysis or Stream Analysis Anomaly

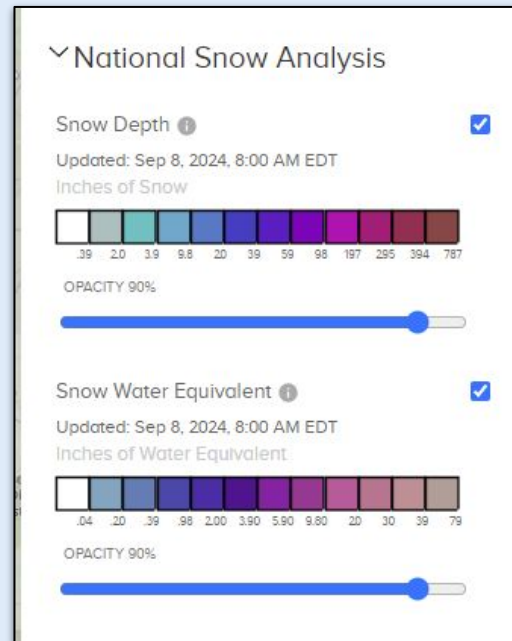
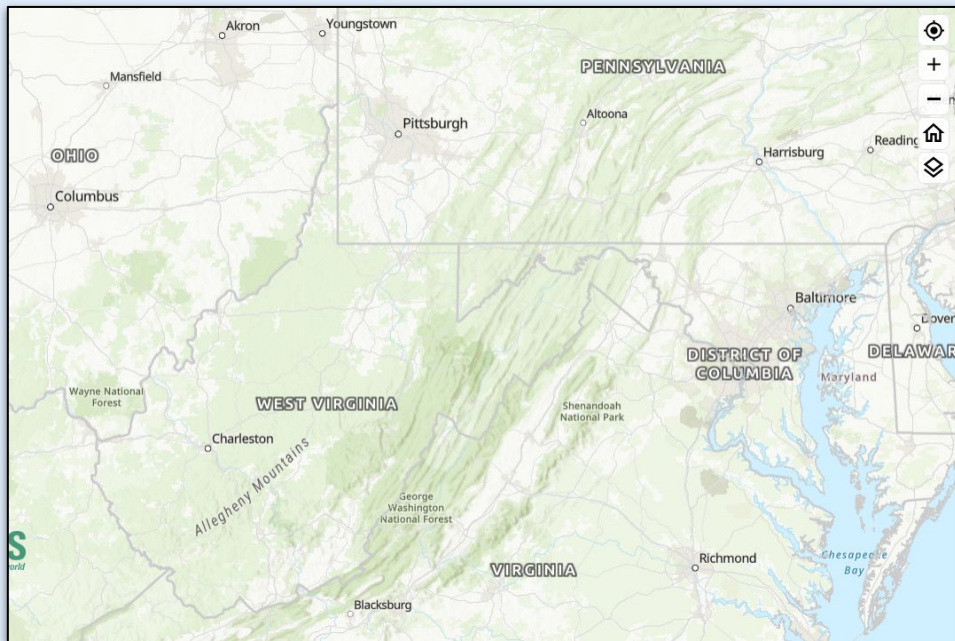
Flood Inundation Maps (FIM)



FIM is now available for all of West Virginia as of Oct 2024. (You have to zoom in to see FIM.)
More on this later...



National Snow Analysis



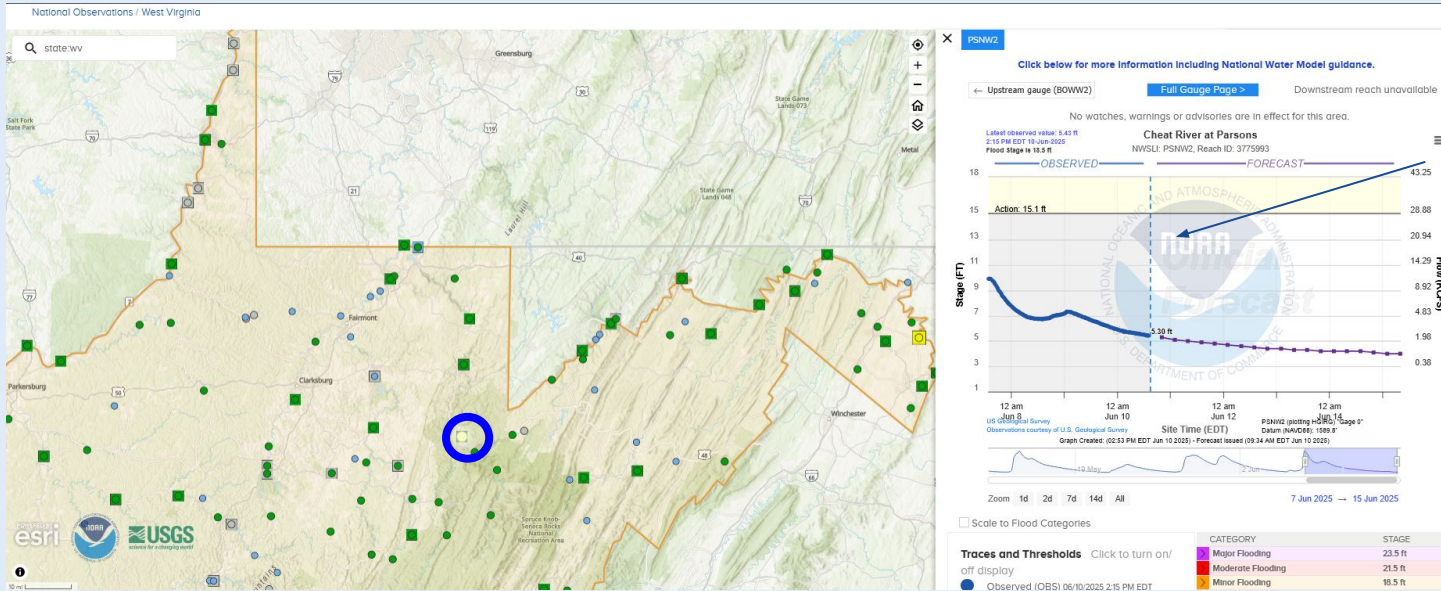
Snow Depth and Snow Water Equivalent Data from National Operational Hydrologic Remote Sensing Center (NOHRSC)

Part 2:

NWPS River Gage pages

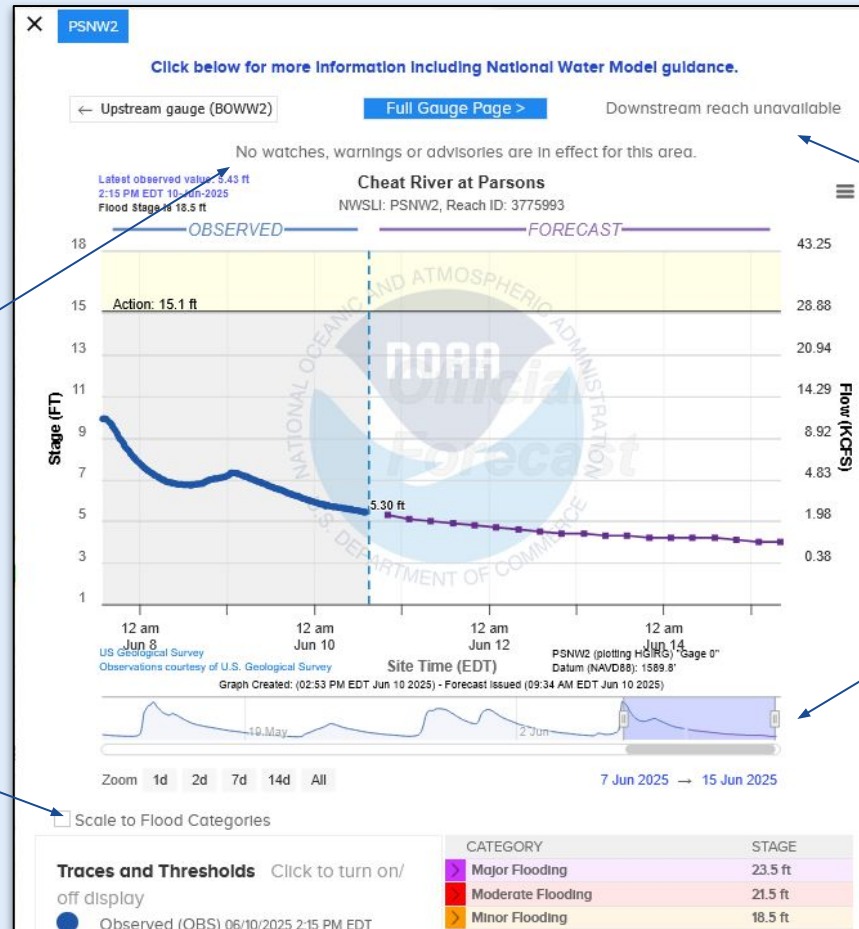
Clicking on a Location

Opens a pop-up window to show observations, the RFC Forecast and other information.



Map centers around the location you selected. The icon for the selected location is now a yellow circle.

Pop-up Window



Active watches
& warnings

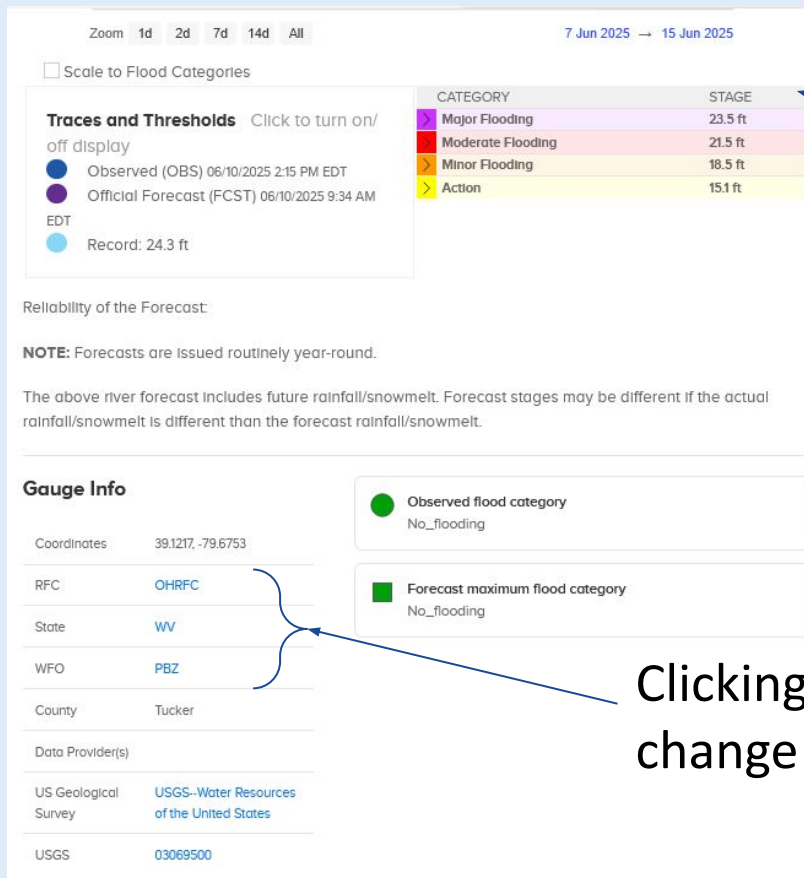
Toggle to
upstream or
downstream
gages

Rescale plot to show
all flood categories

Adjust the plot
zoom to show
more observed or
forecast data

Pop-up Window (Continued)

Toggle
Observations and
Forecast Data on
and off



NWS Flood
Stages



Gage metadata
including a link to the
USGS website



Clicking these links will
change the map boundary

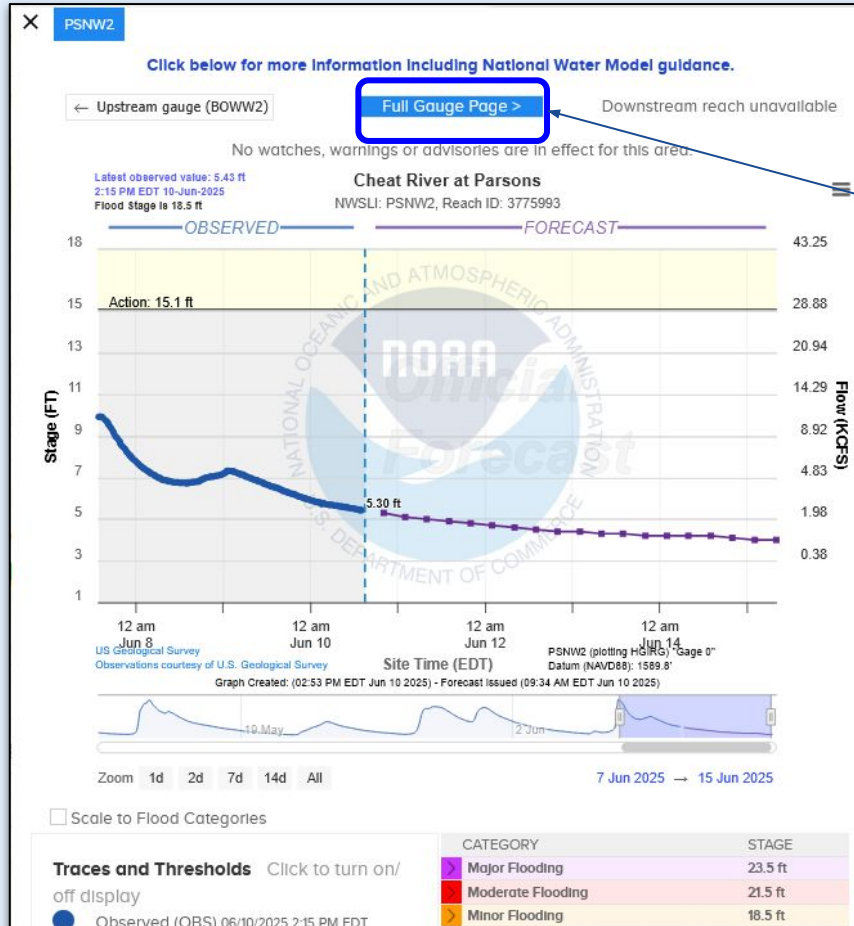


Part 3:

NWPS Gage Page Example

Parsons, WV (PSNW2)

Open the “Full Gage Page”



Clicking the “Full Information” button at the top of the pop-up window will open the Gage page for the selected location in a new tab.

Parsons, WV (PSNW2) - RFC Forecast

Cheat River at Parsons

Last updated: Jun 10, 2025, 3:16 PM EDT

No watches, warnings or advisories are in effect for this area.

Official Forecast

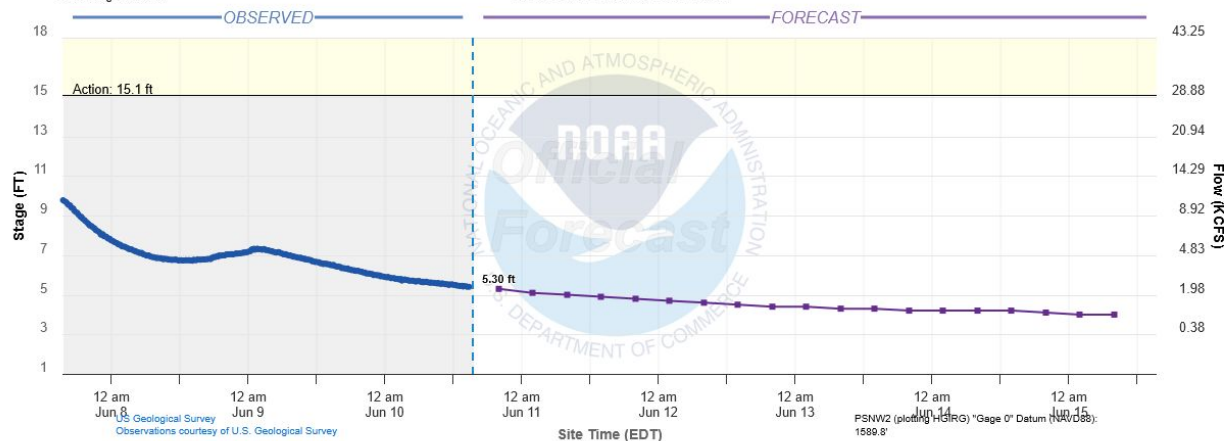
National Water Model Guidance

← UPSTREAM GAUGE (BOWW2)

Downstream gauge unavailable

Latest observed value: 5.4 ft
2:45 PM EDT 10-Jun-2025
Flood Stage is 18.5 ft

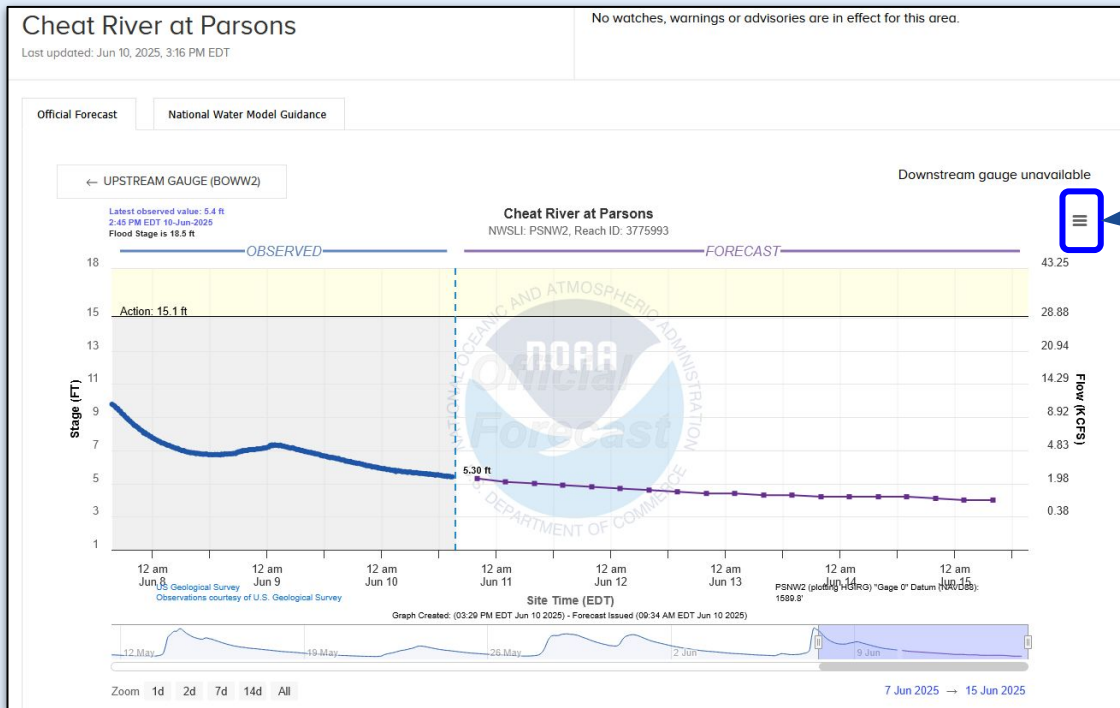
Cheat River at Parsons
NWSLI: PSNW2, Reach ID: 3775993



You can use the National Water Model Guidance tab to view the NWM model guidance for this location.

Similar to the pop-up, you can toggle between upstream and downstream gages, and adjust the view period.

Parsons, WV (PSNW2) - RFC Forecast



View in full screen

Print chart

Download PNG image

Download JPEG image

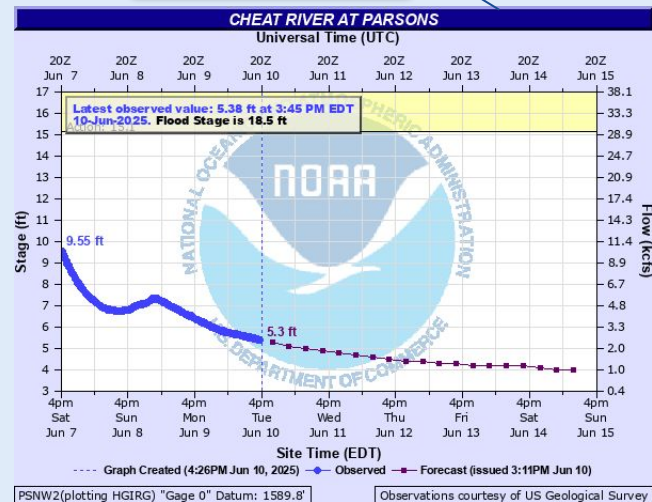
Download PDF document

Download SVG vector image

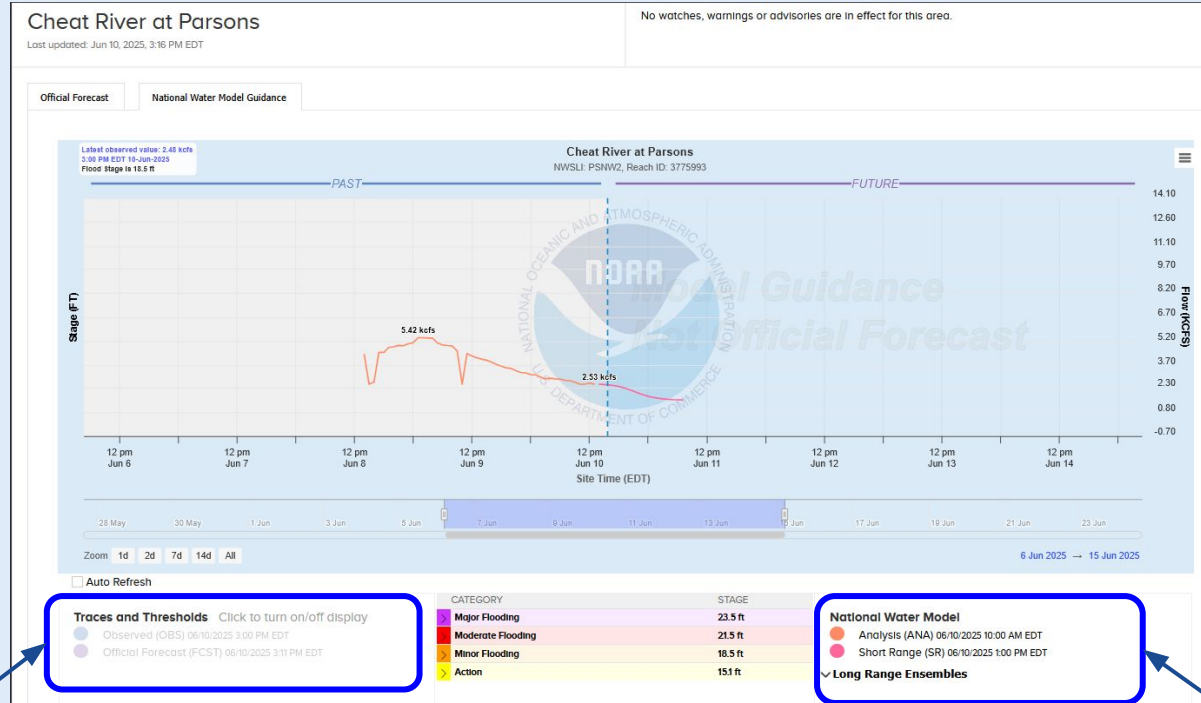
View Static Hydrograph

View Tabular Data

Menu on upper right above hydrograph can toggle options to print static images and view tabular data



Parsons, WV (PSNW2) - NWM Guidance



Can toggle on observation
and RFC forecast trace

Toggle NWM Model data
and Ensembles on and off.

Parsons, WV (PSNW2) - Flood Impacts

Flood Impacts ●

21.5 - Water begins to flood low lying sections of Parsons along Walnut, 2nd, 3rd and Water Streets and in the south end of Parsons, Poplar and Missouri Streets. Flooding also occurs along areas near River Avenue, Currance Street and around the Parsons Nursery.

20 - Flooding affects portions of Water Street, Walnut Street, 4th Street, River Avenue and Buchanan Street.

19.5 - Water levels reach the flood levels of the flood of February 19, 2000.

[SHOW MORE FLOOD IMPACTS](#)

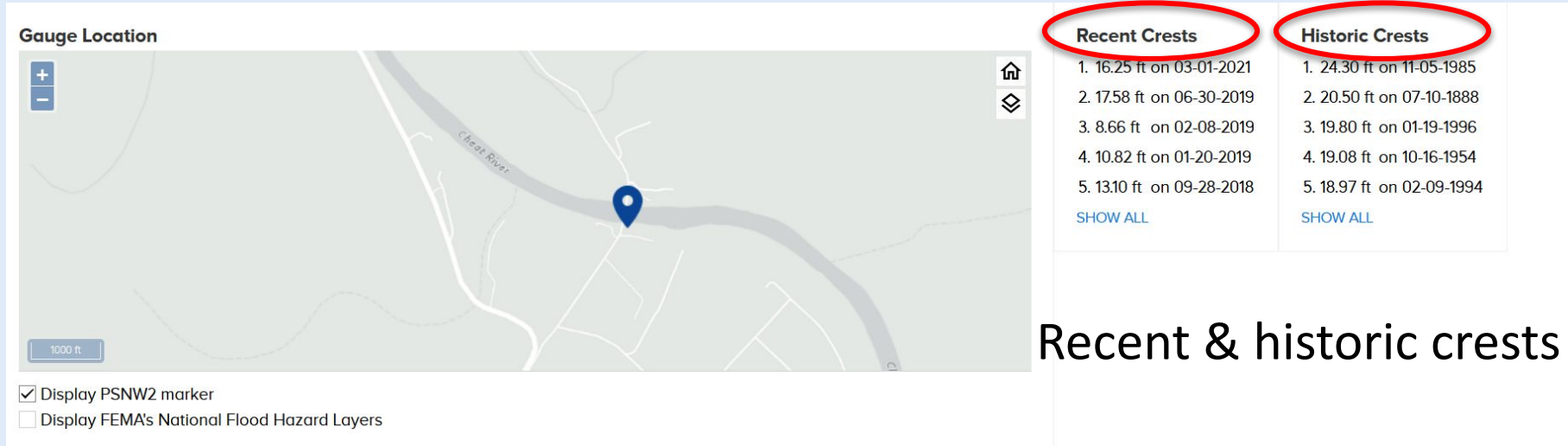
Three flood impacts are shown by default. You can view more by clicking the link.

Gauge Info

Coordinates	39.1217, -79.6753
RFC	OHRFC
State	WV
WFO	PBZ
County	Tucker
Data Provider(s)	
US Geological Survey	USGS—Water Resources of the United States
USGS	03069500

Gage Information includes a link to the USGS website for this location.

Parsons, WV (PSNW2) - Gage Map & Crests



Parsons, WV (PSNW2) - Datum & Photos

Vertical Datum Table

TYPE	NAVD88
Major Flooding	1613.30 ft
Moderate Flooding	1611.30 ft
Minor Flooding	1608.30 ft
Action	1604.90 ft
Latest Value	1595.21 ft
Gauge Zero	1589.80 ft

Gauge Photos

Photo 1 of 3



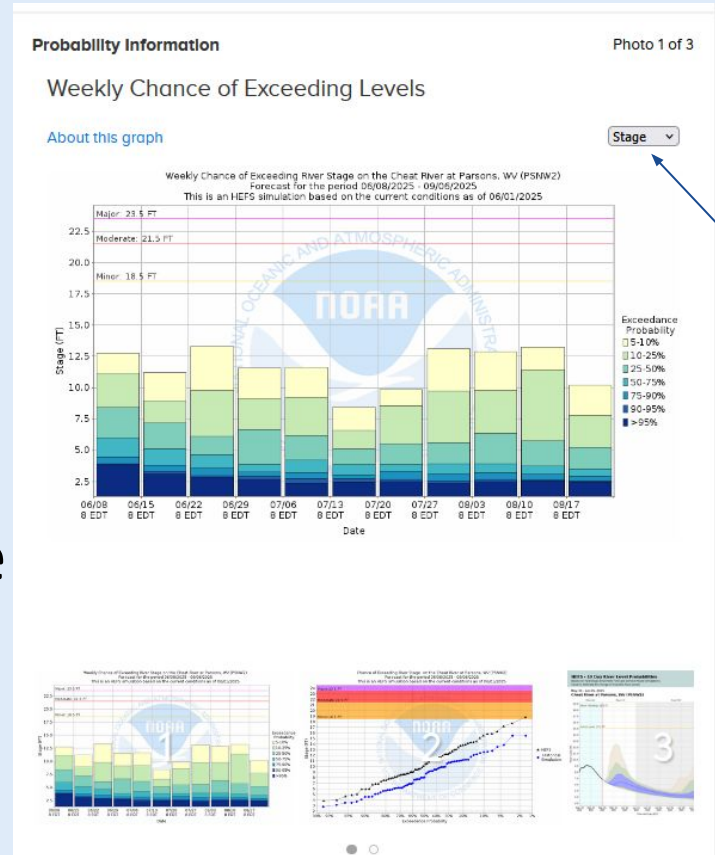
River gage at Parsons, WV on the Cheat River.



Parsons, WV (PSNW2) - Ensembles

Three types of ensembles are available for this location.

Hydrologic Ensemble Forecast System (HEFS) are shown first.



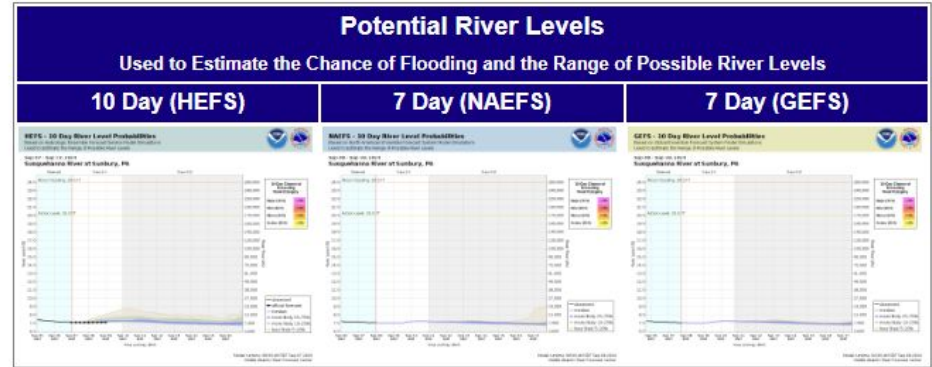
Click here
to see
plots or
flow or
volume

Ensembles (Cont.)

Meteorological Model
Ensemble Forecasts (MMEFS)
and HEFS plots are shown
under “Unique Local Info”.

Click each graph to go to the
MMEFS website for this
location.

Unique Local Info



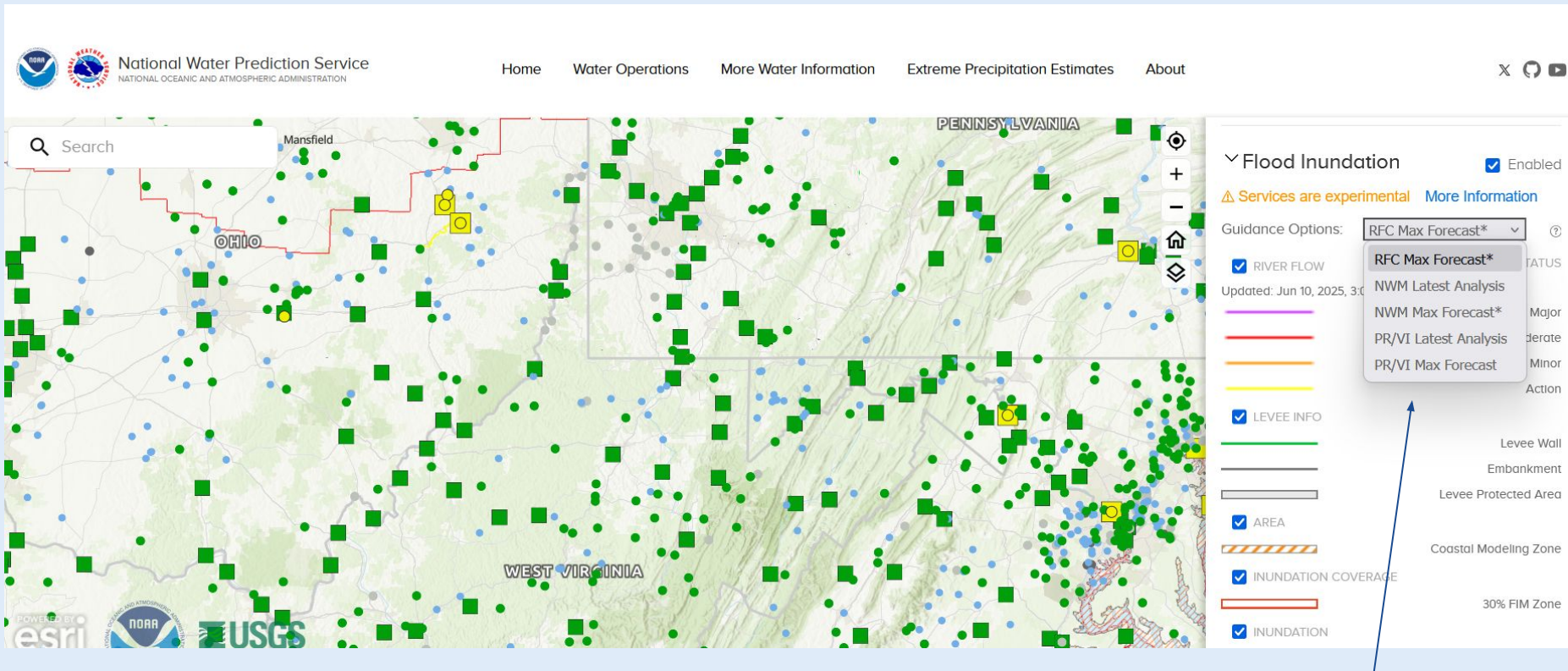
Note: Use the official hydrograph at the top of this web page for river levels within the next 72 hours.

Click individual graphics to enlarge.

Part 4:

NWS Flood Inundation Mapping

Forecast Flood Inundation Mapping Services



Three available options: RFC Max Forecast, NWM Latest Analysis, and NWM Max Forecast

Forecast Flood Inundation Mapping Services

NWM Latest Analysis

A snapshot of the most recent NWM modeled flooding

Adjusted to Observations

Generated only when/where the NWM analysis indicates flooding may be occurring

Updates every ~55 minutes

No future rainfall - only radar/rain gage observed rain

NWS RFC 5-Day Max Forecast*

Based on 5-day NWS RFC forecasts

Available only near/downstream of NWS River forecast points

Generated when RFC forecast reaches “action stage.”

Updates ~45 minutes of RFC forecast updates.

Future Rainfall - 48 to 72 hour human created rainfall forecast.*

NWM 5-Day Max Forecast

Peak NWM streamflow forecast over next 5 days

Available Nationwide

Used for rivers and streams not covered by an RFC forecast

Generated only where NWM forecasts indicate flooding may occur.

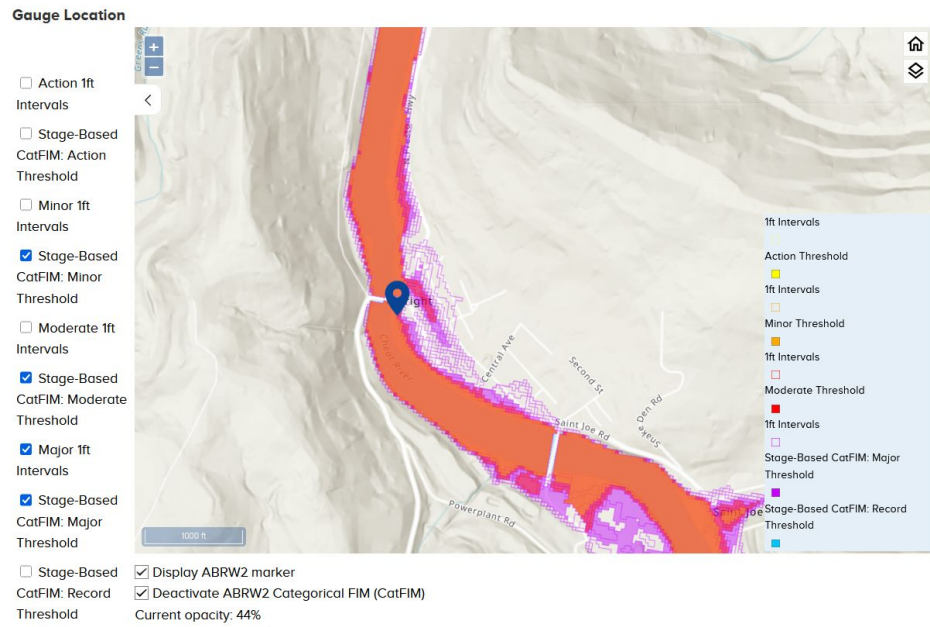
Updates every 6 hours future rainfall update

Future Rainfall - 5 days of raw model forecast rain

DYNAMIC ONLY - visible only when high water expected

Static Map - Categorical FIM (CatFIM)

*Planning tool near existing NWS forecast points -
Sample Below Cheat River at Albright*



Available where CatFIM is considered to have skill/viable)

Static flood extent for official NWS flood categories [Action, Minor, Moderate, Major, Record]

- Only available ~5 miles upstream and downstream of a forecast point

When to use... For planning on 'blue-sky' days ahead of potential flood events

Possible Use Examples:

'Go to' places for resource staging?

Which bridges may be at risk of flooding?

Which evacuation routes are preferred?

- More will come online as CatFIMs are reviewed/improved by each NWS office.

Available on individual NWS gauge Forecast pages

NWS FIM Limitations / Caveats

NWS FIM may have issues/errors near:

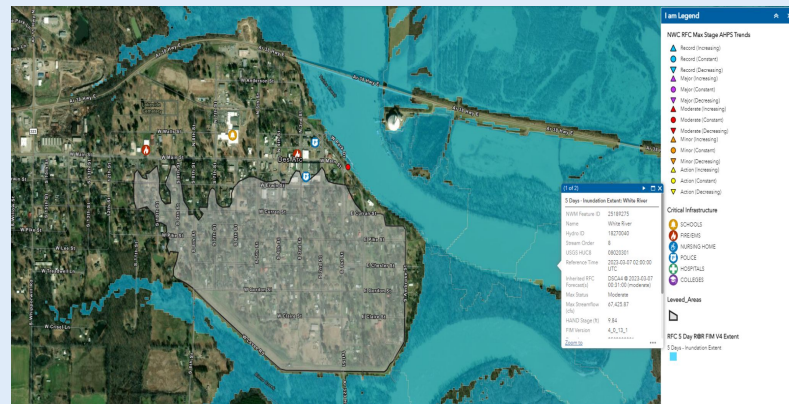
- Bridges (recently improved with more coming)
- Big Metro Areas
- Levees/Floodwalls/Embankments
- Reservoirs
- River Confluences

This first iteration only includes maps of the extent of flooding

- *Coming later... depth of flooding*

Each service is based on one weather and water forecast or model - no range of possible outcomes

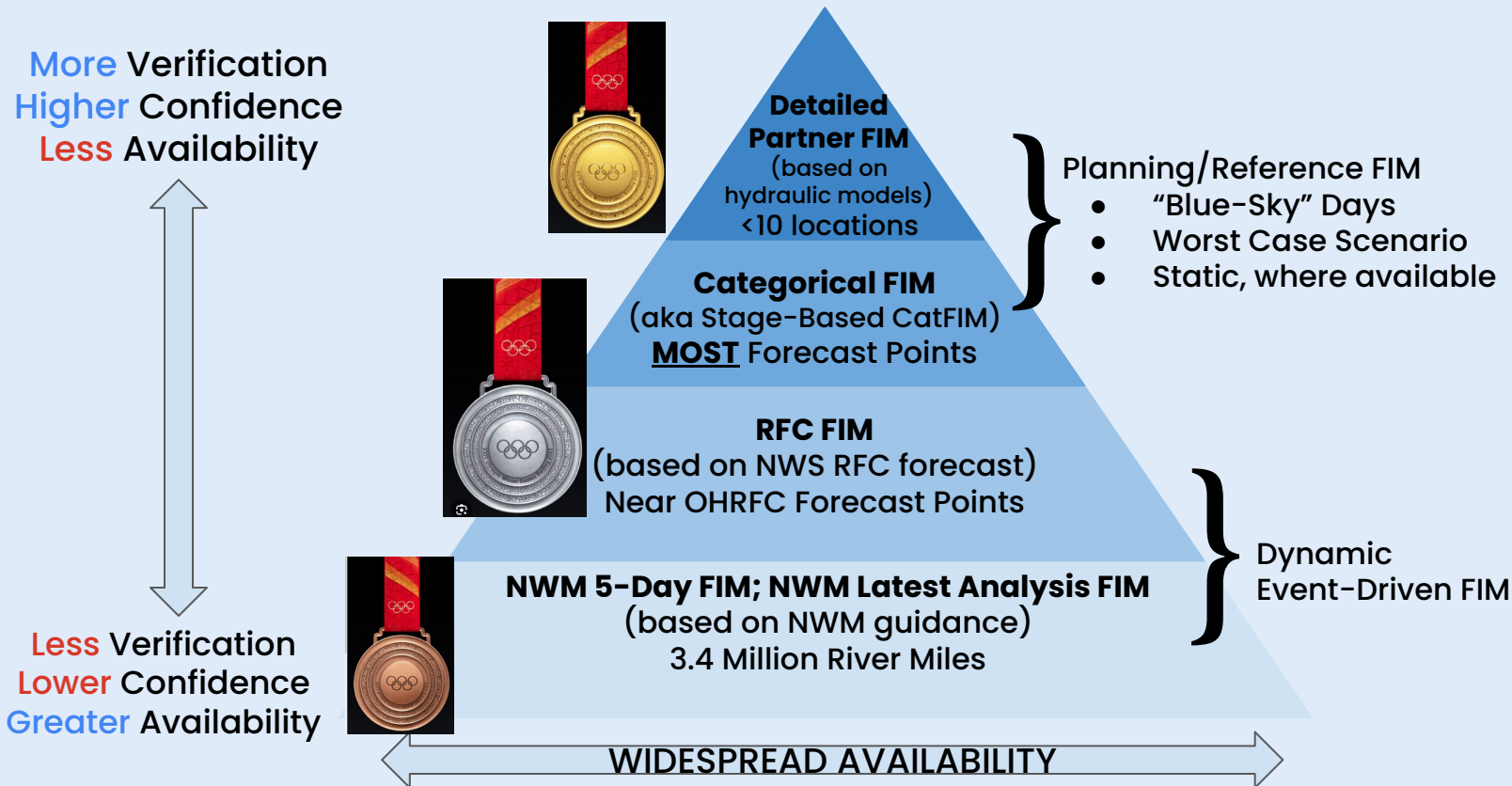
NOT regulatory/NOT related to FEMA maps - these are maps of observed and forecast flooding produced on an event basis



“Neighborhood” Flood Mapping!
Not house by house resolution

USGS/US Army Corps FIM (gold standard) will have higher level of detail than NWS FIM

CONFIDENCE and AVAILABILITY in Flood Inundation Mapping



FIM Support from NWS

Emergency Managers and Floodplain Managers can request a FIM review or FIM support.

- Call your local NWS office and state that you would like a flood inundation map review.
- Provide your name, agency, email, call back number, and any time constraints.
- Please provide a specific location(s) for the FIM review such as:
 - Road intersection
 - Specific bridge location
 - Address of a structure
 - Critical Infrastructure facility

Keep in mind:

- ★ Based on available NWS staff (WFO, RFC, or NWC)
- ★ Warning operations take priority
- ★ May take some time to complete
- ★ We may not provide a map
- ★ Must not be used in a vacuum

Part 4:

NWS Flood Inundation Mapping

Examples

RFC FIM - Wheeling, WV April 2024





NWS Flood Inundation Mapping Services

February 16, 2025
9:30 AM

Tug Fork River - Kermit, WV (KRMW2)

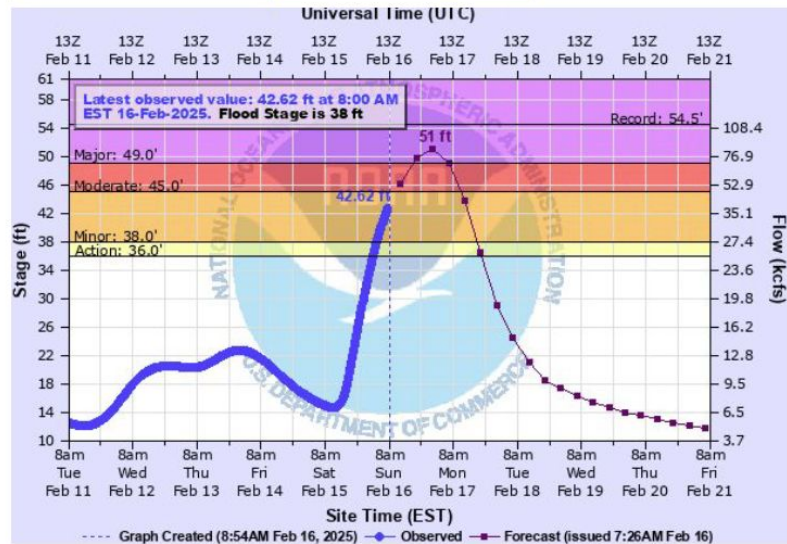
- **Forecast Crest Height:** 51 Feet
- **FIM Type:** Stage-Based Categorical (Depth NOT Included)
- **FIM Creation Time:** 2/16/25 @ 9:30 am

Confidence:

Low

Medium

High



Latest Observations/Forecasts: [Tug Fork River at Kermit](#)



Disclaimer: This map shows the flood extent based on a river crest of a Major Flood.
This is an approximate-based FIM which should be used more conservatively.



National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

FOR OFFICIAL USE ONLY

National Weather Service
Charleston, WV



Flood Inundation Mapping Performance

March 4, 2025
1:06 PM

NWS RFC Forecast FIM



National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

National Weather Service
Charleston, WV

Final Notes

- ALL NWS FIM are “Experimental” and “In Development” until at least 2026 (full U.S. release).
- NWS Flood Warnings and River Forecasts are still the primary flood forecast information to share and explain to the public.
- We need verification!
 - We are always looking for photos - Drone footage and surveys
 - These will improve our services

Thank you!

Contact: Alicia Miller alicia.a.miller@noaa.gov

National Water Prediction Service: [Storymap & Interactive Guide](#)

NWPS API: <https://api.water.noaa.gov/nwps/v1/docs/>

FIM REST Services: <https://maps.water.noaa.gov/server/rest/services>

More Info on FIM and NWPS: <https://www.weather.gov/owp/operations>