NOAA's National Water Center

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Water Predictions Operation Division Director

Overview

- National Water Center
- Coordinated Ocean Observations and Research Act of 2020 Public Law No: 116-271
- Flood Hazard Outlook (FHO)
- NWS Flood Inundation Mapping (FIM)
- integrated Flood Inundation Mapping (iFIM) Services
- FEMA Liaison

National Water Center (NWC)

- In **collaboration** with NOAA field offices and other federal water agencies, is responsible for the delivery of forecast guidance and analyses, and inundation information (**total water prediction**) - as well as other information that **augments** services provided at local, regional or national levels - for the United States. This includes:
  - Flash Flooding
  - Riverine Flooding
  - Flood Inundation Mapping
  - Water Resource Outlooks
  - Decision-support services to inform emergency and water resources management decisions

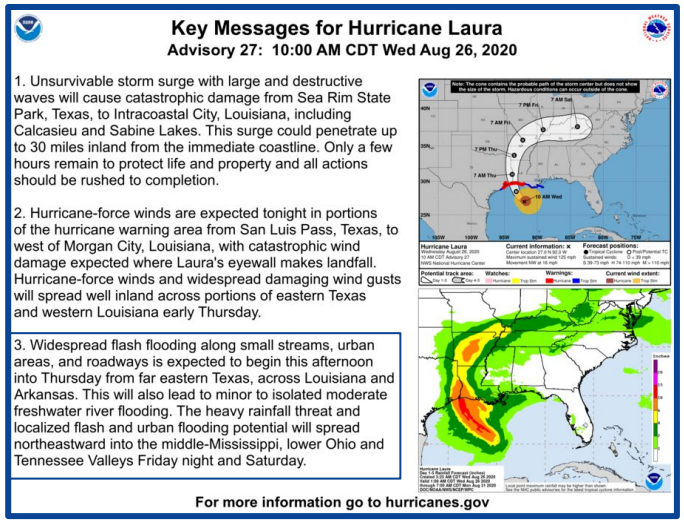
(*Concept of Operations (CONOPS) National Oceanic and Atmospheric Administration, National Weather Service, Office of Water Prediction, National Water Center, Water Predication Operations Division)*

Coordinated Ocean Observations and Research Act of 2020 (12/31/2020 Became Public Law No: 116-271)

- Reauthorized through FY2025 and revises the Integrated Coastal and Ocean Observation System (IOOS), which is a network of federal and regional entities that provide information about the nation's coasts, oceans, and Great Lakes, as well as new tools and forecasts to improve safety, enhance the economy, and protect the environment.
- Revised the authority of the National Oceanic and Atmospheric Administration (NOAA) to conduct scientific assessments related to storms, including to (1) direct NOAA to seek public input before the Named Storm Event Model (the official meteorological and oceanographic computerized model which utilizes data to replicate the magnitude, timing, and spatial variations of winds, rainfall, and storm surges associated with named storms for which post-storm assessments are conducted) takes effect, and (2) allow NOAA to deploy sensors to areas in coastal states that are at the highest risk of experiencing geophysical events that would cause indeterminate losses.
- Provides **statutory authority** for NOAA's National Water Center. (The center currently exists at NOAA as the research and operational center of excellence for hydrologic analyses, forecasting, and related decision support services.)
- Additionally, directs the National Weather Service (NWS) to make a policy directive for the National Water Center publicly available. The NWS must also (1) initiate and **lead all research and development activities to develop operational water resource prediction** and related decision support products, (2) collaborate with relevant state and federal agencies **regarding total water prediction**, and (3) collaboratively develop capabilities necessary for total water predictive capacity.

Where NWC Fits in Tropical Information

- In collaboration with WPC, and River Forecast Centers (RFC), is responsible for providing guidance to inform the freshwater hydrologic impacts across the conterminous United States, Puerto Rico/US Virgin Islands and the Hawaiian Islands for tropical cyclones.
- Serves as the NWS hydro DSS coordinator



Key Messages for Hurricane Laura
Advisory 27: 10:00 AM CDT Wed Aug 26, 2020

1. Unsurvivable storm surge with large and destructive waves will cause catastrophic damage from Sea Rim State Park, Texas, to Intracoastal City, Louisiana, including Calcasieu and Sabine Lakes. This surge could penetrate up to 30 miles inland from the immediate coastline. Only a few hours remain to protect life and property and all actions should be rushed to completion.

2. Hurricane-force winds are expected tonight in portions of the hurricane warning area from San Luis Pass, Texas, to west of Morgan City, Louisiana, with catastrophic wind damage expected where Laura's eyewall makes landfall. Hurricane-force winds and widespread damaging wind gusts will spread well inland across portions of eastern Texas and western Louisiana early Thursday.

3. Widespread flash flooding along small streams, urban areas, and roadways is expected to begin this afternoon into Thursday from far eastern Texas, across Louisiana and Arkansas. This will also lead to minor to isolated moderate freshwater river flooding. The heavy rainfall threat and localized flash and urban flooding potential will spread northeastward into the middle-Mississippi, lower Ohio and Tennessee Valleys Friday night and Saturday.

For more information go to hurricanes.gov

Public Advisory

RAINFALL: From this afternoon through Friday, Laura is expected to produce rainfall totals of 5 to 10 inches, with isolated maximum amounts of 15 inches across portions of the northwestern Gulf Coast from western Louisiana to far eastern Texas, and northward into much of Arkansas. This rainfall will cause widespread flash and urban flooding, small streams and creeks to overflow their banks, and minor to isolated moderate freshwater river flooding.

By Friday into Saturday, Laura will produce rainfall totals of 2 to 4 inches, with isolated maximum amounts of 6 inches across the mid-Mississippi and portions of the Lower Ohio and Lower Tennessee Valleys. This rainfall may lead to localized flash and urban flooding and rapid rises on small streams.

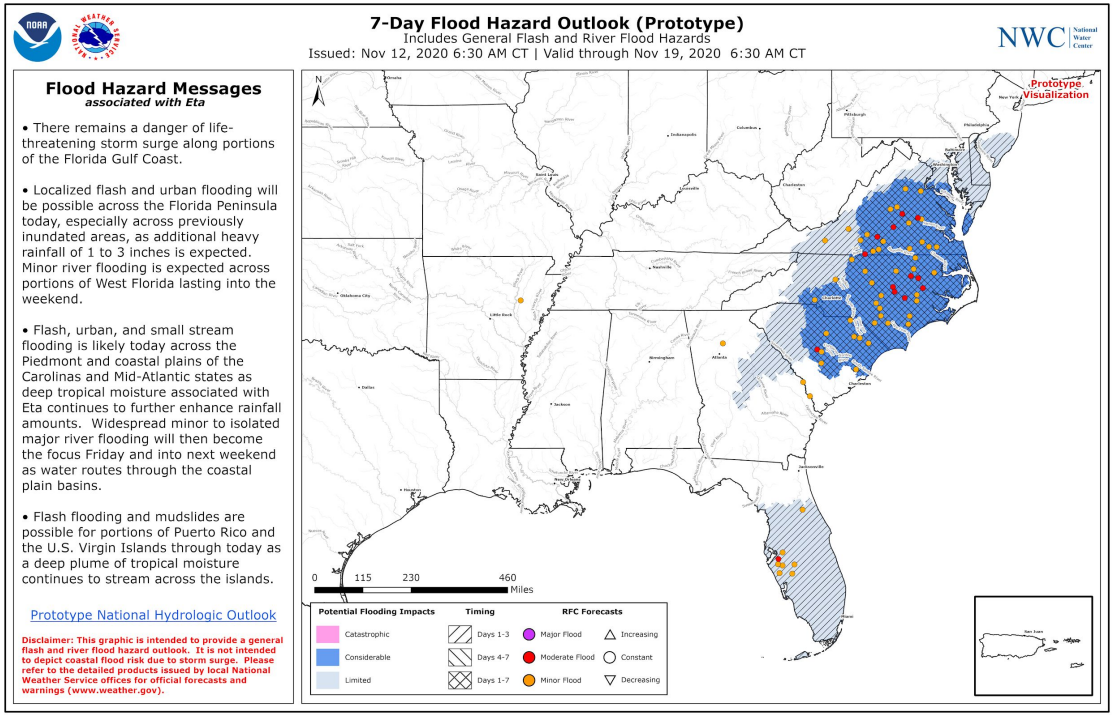
Tropical Flood Hazard Outlook (FHO)

(Status: Prototype)

Limited - Base flash flooding and/or minor river flooding is expected.

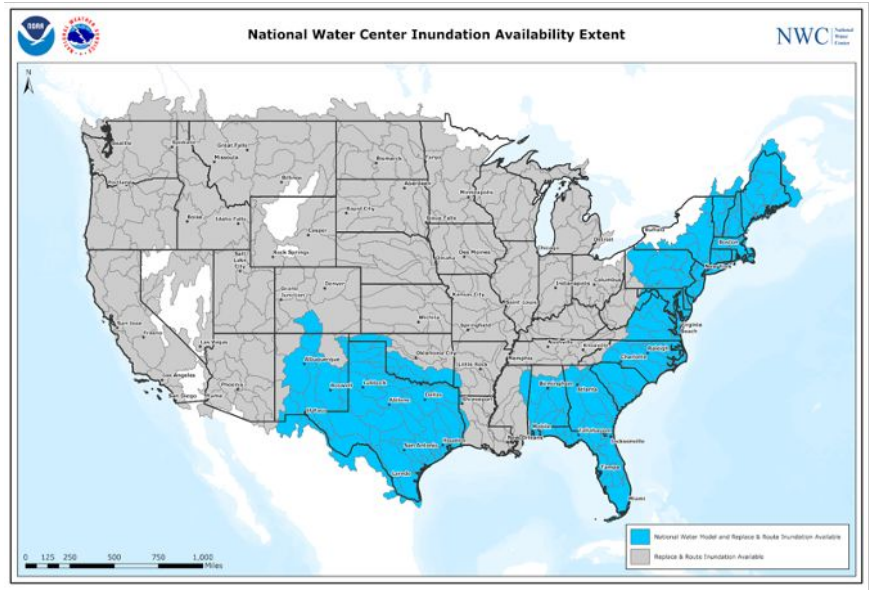
Considerable - Significant flash flooding and/or moderate/major river flooding is expected.

Catastrophic - Exceedingly rare and widespread flash flood and/or river flooding is expected.



Spatial Coverage of NWS FIM Services

FIM coverage status : April 2021

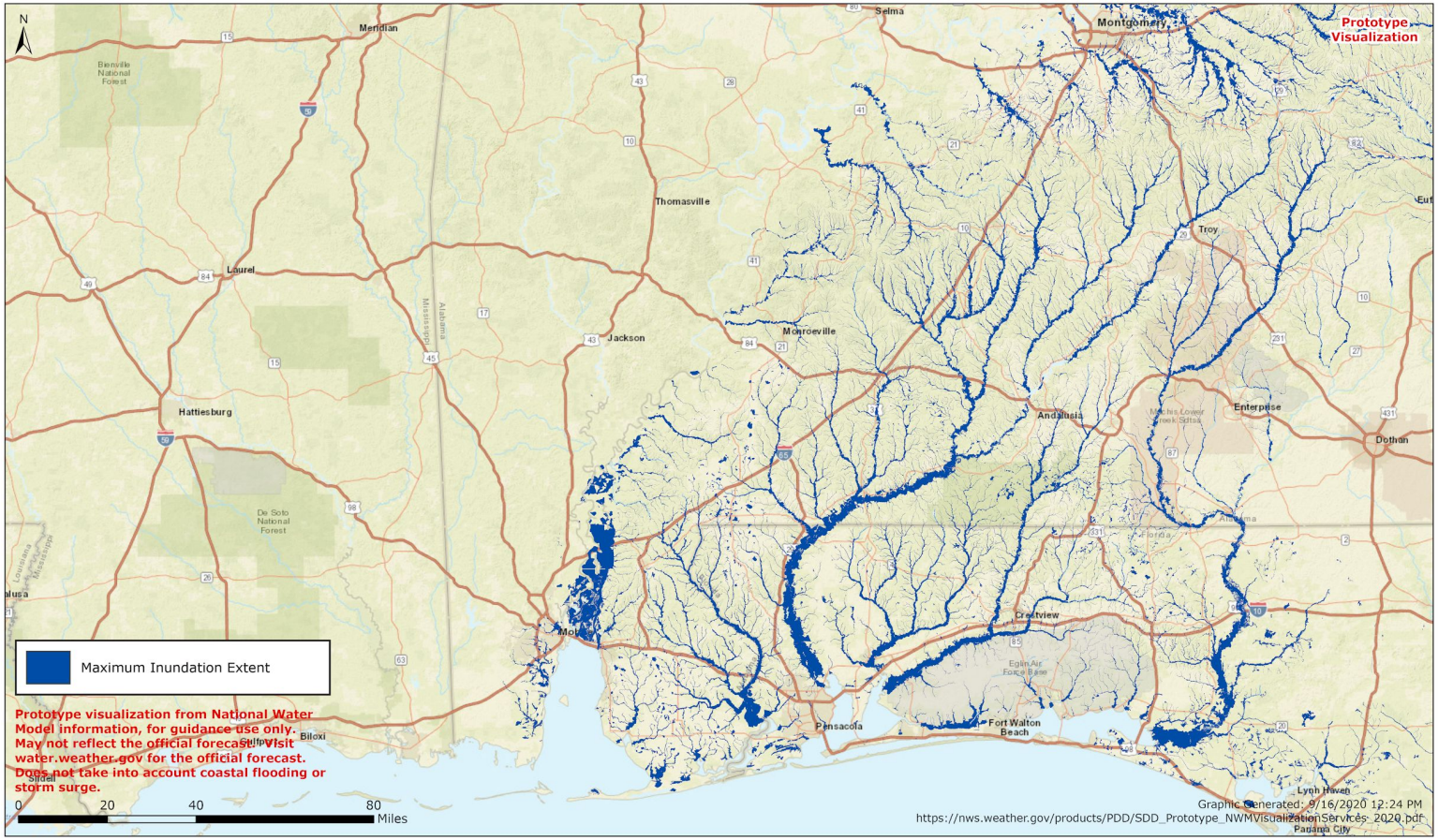


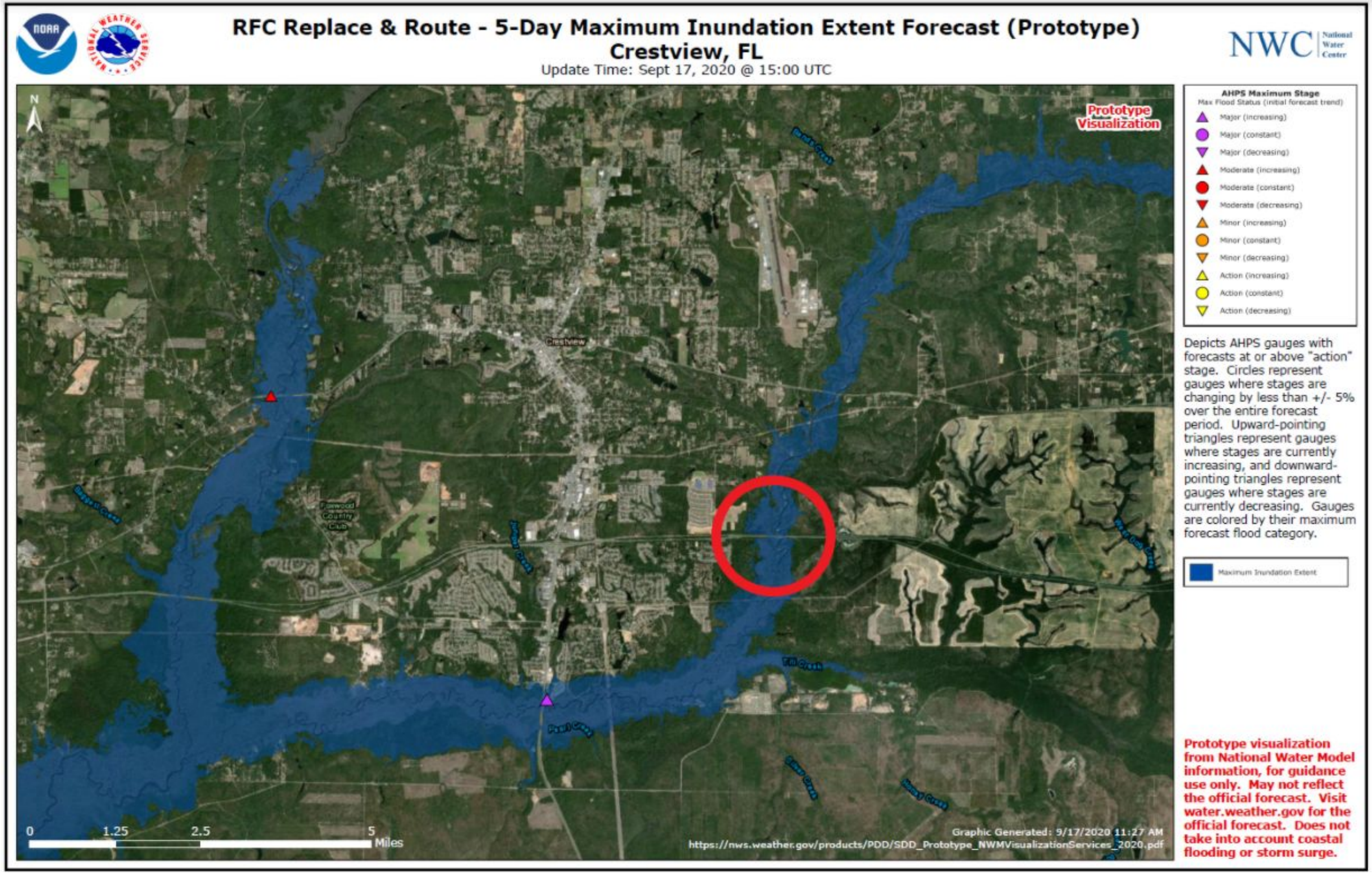
Model Source	Spatial Resolution	Current coverage	River Miles with FIM
RFC (Replace and Route)	At and downstream of ~3800 NWS forecast points	Both blue and gray shaded areas	104K river miles
NWM	NHDplus stream network	Blue shaded areas only	715K river miles (of 3.4M total in CONUS NHDplus)

National Water Model - 10-Day Maximum Inundation Extent Forecast (Prototype)

Reference Time: Sept 16, 2020 @ 00:00 UTC
Valid Times: Sept 16, 2020 @ 03:00 UTC - Sept 26, 2020 @ 00:00 UTC

NWC National Water Center




RFC Replace & Route - 5-Day Maximum Inundation Extent Forecast (Prototype)
Crestview, FL
Update Time: Sept 17, 2020 @ 15:00 UTC
NWC National Water Center
Prototype Visualization
Crestview
AHPS Maximum Stage
Max Flood Status (initial forecast trend)
Major (increasing)
Major (constant)
Major (decreasing)
Moderate (increasing)
Moderate (constant)
Moderate (decreasing)
Minor (increasing)
Minor (constant)
Minor (decreasing)
Action (increasing)
Action (constant)
Action (decreasing)
Depicts AHPS gauges with forecasts at or above "action" stage. Circles represent gauges where stages are changing by less than +/- 5% over the entire forecast period. Upward-pointing triangles represent gauges where stages are currently increasing, and downward-pointing triangles represent gauges where stages are currently decreasing. Gauges are colored by their maximum forecast flood category.
Maximum Inundation Extent
Prototype visualization from National Water Model information, for guidance use only. May not reflect the official forecast. Visit water.weather.gov for the official forecast. Does not take into account coastal flooding or storm surge.
0 1.25 2.5 5 Miles
Graphic Generated: 9/17/2020 11:27 AM
https://nws.weather.gov/products/PDD/SDD_Prototype_NWMVisualizationServices_2020.pdf

NWC: Flood Inundation Mapping

- FIM Playbook (*in development*)
  - Details scaled operational posture of FIM IDSS (ties to NWC Incident Command Structure (ICS) activation levels)
    - FIM Coordinator, Analyst(s), Support, Verification
  - Details field coordination / reachback capability

iFIM Initial Development Strategy

- Creation of iFIM at NWC
  - Provide user interface to NWC operations for review and selection of multiple-sourced FIM during events
  - Allows for NWC forecaster to be “in the loop”
  - Sources include USACE, USGS, and NWS FIM
  - Manual output of “best available” FIM after evaluation of multiple-sourced FIM
- Dissemination of iFIM
  - Establish basic service for integrated FIM visualization for near real-time events in 2021
  - Publish ad-hoc updates for internal inter-agency awareness

FEMA Liaison at NWC

- Whitney Flynn, Hydrologist (started May 10, 2021)
- Special thanks to:
  - Chris Blaz, Director, National Watch Center
  - Ph.D. Somer Erickson, FEMA LNO to Storm Prediction Center
  - Matthew Greene and Tiffany O'Conner- FEMA LNOs to the National Hurricane Center

QUESTIONS?