



NORTH CAROLINA
Department of Transportation



BridgeWatch, FIMAN-T, FIMAN-T Surge

METTS East

March 30th, 2022



Three Flood Awareness Products from Hydraulics Unit Will Be Available in the Future for Direct Use by Division Personnel

1) BridgeWatch



2) FIMAN-T

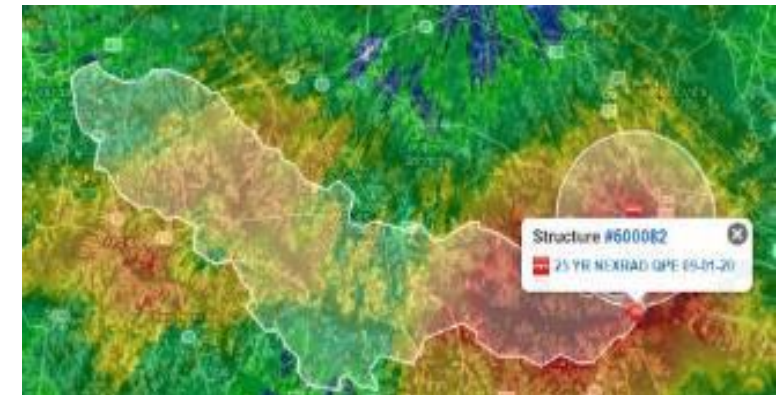
3) FIMAN-T Surge



How BridgeWatch Works to Send Alerts

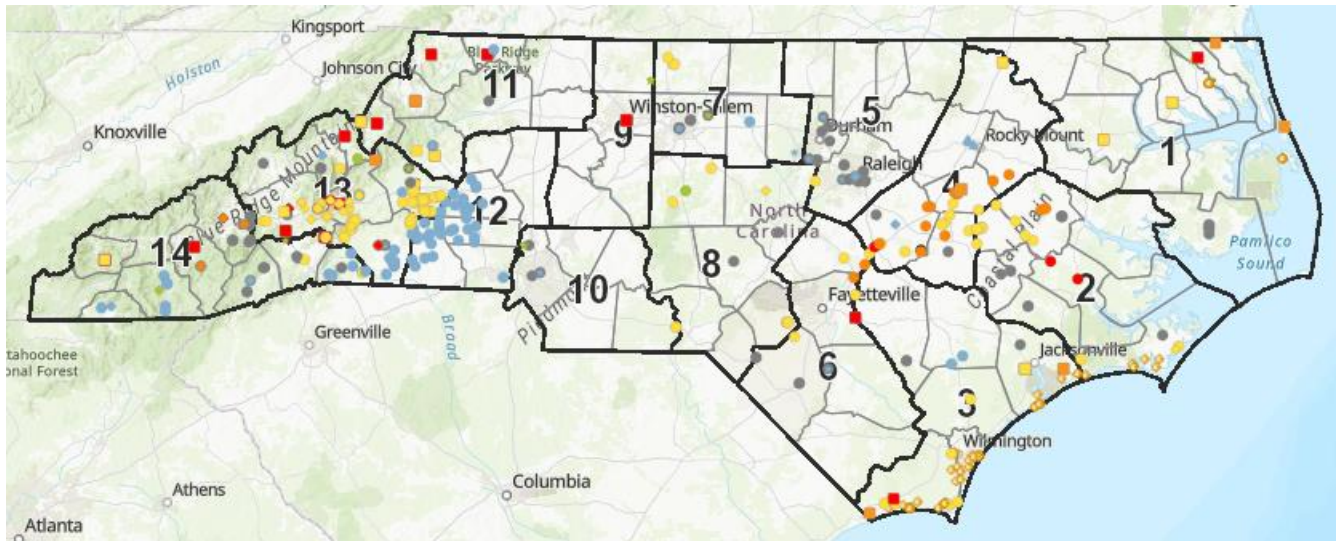


- 450 Gauged Bridges with Pre-Set Elevations Triggering:
 - Overtopping Alerts
 - Low Chord Alerts (Bottom of Girder)
 - Freeboard Alerts (2ft Below Girder)
- Rainfall Alerts (25-year Storm and Greater) from Weather Radar; About 7000 Bridges



BridgeWatch Output

- 1) Flood Alerts Direct to Text or Email
- 2) Flood Alerts Displayed on Online Map
- 3) Summary of Alerts in Excel Format



[External] BridgeWatch - Device Alert

N
 NCBridgeWatch@ncdot.bridgewatch.us
 To ✓ Smith, Charles R

i You forwarded this message on 2/24/2022 7:14 AM.
 If there are problems with how this message is displayed, click h

CAUTION: External email. Do not click links or open attachments

Structure Overtopping bridges: 780045 (In Rockingham)

[NCEM Structure Overtopping](#)

Bridge: [780045](#)

County: Rockingham

Road: SR2282

Stream: DAN RIVER

Lat\Long: 36.485,-79.763

Gage: 30020

Time: 2022-02-24 06:16:01 UTC

Event Value: 49.02

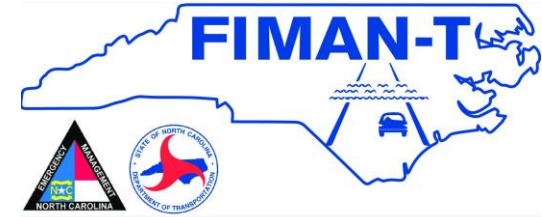
Threshold Exceeded: 45.4

Confirmation:Yes

(USGS Alert) USGS Structure
 Overtopping Br [990040](#) (Yancey)@
 NC197 & CANE RIVER Lat\long:
 35.830,-82.318 Time: 2021-12-03
 15:30:00.0 17.77 > 17.06

FIMAN-T and FIMAN

Flood Inundation Mapping and Alert Network for Transportation



Gauges and River Water Surface Models Are Used To Show Current and Forecasted Flooding from Rivers and Coastal Areas

Users will Investigate Roads of Interest, then Sign Up for Pre-Set and Custom Flooding Alerts by Text and Email, Using a Two-Step Process

(Also note that an Excel-based FIMAN-T summary is in development)

Subscribing to FIMAN Alerts

Step 1 - Start on FIMAN-T Website

The screenshot displays the FIMAN-T website interface. The top navigation bar includes 'FIMAN-T Flood Inundation Mapping and Alert Network for Transportation' and links for 'FIMAN', 'ABOUT', 'MAP', and 'USER'. Below this is a secondary navigation bar with options like 'Gage Based', 'CERA Surge', 'Search Gages', 'Roads Summary', 'Bridge Summary', 'Legend', 'Weather Radar', 'Show Local Roads', 'Show Assets', and 'Show Bridges'. The main content area features a map of the Neuse River at Kinston. A slider at the bottom of the map is set to a stage of 26.5, with a corresponding elevation of 15.3 ft. A legend on the right side of the map shows various symbols for bridges and road inundation levels. Three callout boxes with red arrows provide instructions: 1) Click on a Green Gauge Symbol and Select "Scenario" (pointing to a green gauge symbol on the map); 2) Move Slider Until Road is Highlighted. (See legend at lower right >>>) (pointing to the slider); 3) Caswell Rd starts to flood at River Stage 26.5. Note this elevation for Step 2. (pointing to the highlighted road on the map).

FIMAN-T Flood Inundation Mapping and Alert Network for Transportation

FIMAN ABOUT MAP USER

Gage Based CERA Surge Search Gages Roads Summary Bridge Summary Legend Weather Radar Show Local Roads Show Assets Show Bridges

3) Caswell Rd starts to flood at River Stage 26.5. Note this elevation for Step 2.

2) Move Slider Until Road is Highlighted. (See legend at lower right >>>)

1) Click on a Green Gauge Symbol and Select "Scenario"

Drag to simulate flood severity

Stage (ft) 17.2 19.2 21.2 23.2 25.2 27.2 29.2 31.2

Elevation (NAVD 88) 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

Neuse River at Kinston

Last updated: Feb 25, 2022 at 11:00 AM Site ID: 02089500 Owner: USGS Gage datum: 9.8ft NAVD88

RFC Forecast Peak: No Forecast Available

Stage: 5.5 ft
15.3 ft NAVD 88

Stream Elevation

Constant

Event: 09/22/1999
Hurricane Floyd
Peak Stage: 27.71 ft

Historical Peaks

Roads Affected

Bridges Affected

Legend

Bridges

- Pressure / Weir
- Warning
- Normal
- Not Reporting

NCDOT Assets

- Building
- Land

Road Inundation Levels

- > 5 Ft
- 2 - 5 Ft
- 0.5 - 2 Ft
- 0 - 0.5 Ft

Subscribing to FIMAN Alerts

Step 2 – Set Alerts on FIMAN Website

ALERT SETTINGS
Neuse River at Kinston

Alerts My Account

+ ADD NEW ALERT

Stage	Alert Level	Action
21.0 ft.	Major Flooding	✕
18.0 ft.	Moderate Flooding	✕
14.0 ft.	Minor Flooding	✕
13.0 ft.	Monitor	✕

ALERTS WILL BE SENT WHEN THE FOLLOWING CONDITIONS ARE MET:

Click to Activate/Deactivate

Rises Above Falls Below Forecast to Rise

Forecast to Fall

Selected conditions will be applied to all gage alerts.

Unsubscribe

CANCEL SAVE

Gage Level

Gage Symbols

- Current Condition
- Forecast Peak Condition

Risk Ratings

- Normal
- Monitor
- Minor Flooding
- Moderate Flooding
- Major Flooding
- Not Risk Rated
- Out of Service

Trend

- ↑ Rising
- ↓ Falling
- Constant

Showing 404 Gages
Show All Gages

Neuse River at Kinston

Last updated: Feb 28, 2022 at 8:15 AM Gage datum: 9.8ft NAVD88 Site ID: 02089500 Owner: USGS

Stage: 5.4 ft
15.1 ft NAVD88

1290 cfs

Peak Stage: 12.9 ft
1/23 1:00 AM
No Data Available

No Damages Assessed

Report

Impact

Radar Time: 15 min. ago

2) Set a Custom Alert at the Road Flooding Elevation Found on FIMAN-T

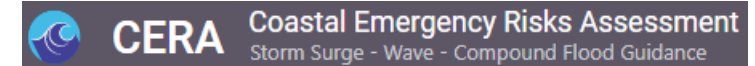
1) Click on The Same Green Gauge Symbol and Select Red Triangle

FIMAN-T Surge

Road Flooding Forecasts Based On Hurricane Storm Surge



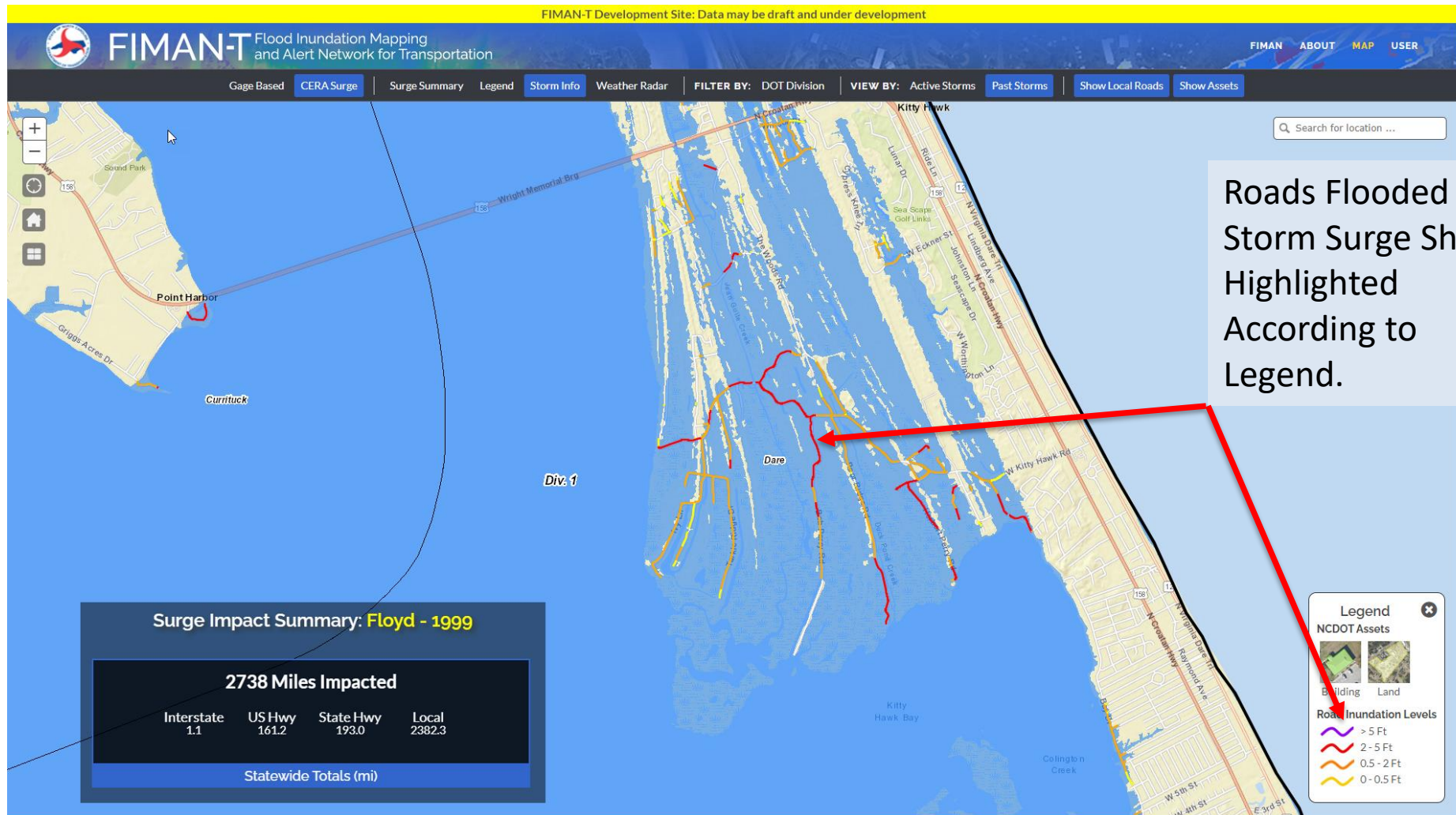
The CERA (Coastal Emergency Risks Assessment) model provides the storm surge water elevation.



FIMAN-T Surge imports CERA water elevations and overlays with Road and Bridge LIDAR.

Roads forecast for flooding are highlighted according to the FIMAN-T Surge legend.

FIMAN-T Surge, Predicted Flooding from Floyd (1999)



Hydraulics Flood Warning Tools

SharePoint Search this site

NCDOT - Hydraulics Flood Warning Tools

Home + New Page details Analytics

Conversations Documents Notebook Pages Site contents Recycle bin Edit


BETA SITE UNDER DEVELOPMENT

BridgeWatch FIMAN-T & FIMAN FIMAN-T SURGE

BridgeWatch

Bridgewatch is a real-time bridge flooding warning system that relies on stream gauges and weather radar to indicate when bridges and culverts are near flooding, actively flooding, or weather conditions are favorable for flooding. Users can subscribe to text and/or email alerts, or view flooding statuses on a GIS map. Uses for Bridgewatch include: Closing and Reopening flooded roadways, compiling inspection list for flooded bridges, relief and resupply route finding.

Users wanting to monitor gauges of interest that are not currently triggering alerts should use [FIMAN](#).



BridgeWatch Alert Descriptions

NON-GAUGE ALERTS: SLOSH, NEXRAD, & QPF

Forecast Coastal Storm Surge SLOSH (Watch-Yellow)

SLOSH ALERT IS ISSUED WHEN HURRICANE STORM SURGE HAS A 10% CHANCE OF EXCEEDING BRIDGE LOW CHORD ELEVATIONS. SLOSH ALERTS INDICATE FAVORABLE CONDITIONS FOR FLOODING - NOT THAT FLOODING IS IMMINENT OR OCCURRING.



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<https://ncconnect.sharepoint.com/sites/HydroFloodWarningTools>

Additional training planned for June