



Mecklenburg County Flood Information & Notification System (FINS)

<https://FINS.mecknc.gov/>

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Mecklenburg County: Flood Information & Notification System (FINS)

FINS Primary Functions:


1. Flood Monitoring and Response
2. Flood Inundation - Impact Analysis
3. Machine Learning (ML) Flood Forecasting

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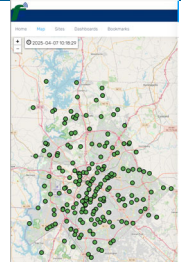
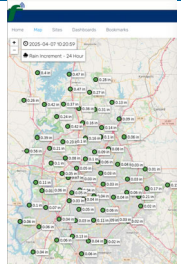
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Mecklenburg County: Flood Information & Notification System (FINS)


USGS Rain Gauges – 70
County – 546 square miles, rain gauge every 7.8 square miles

Stream Gauges – 115
1,200 miles of creeks (not including rivers and lakes)


- USGS – 50
- LCS – 65

High Hazard Dam Gauges – 11

Creek Cameras - 42



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Mecklenburg County: Flood Information & Notification System (FINS)


Components of Flood Monitoring and Response

- Alarm Warning Levels
 - ALERT – INVESTIGATE – EMERGENCY
 - Rain accumulation thresholds
 - Stage Thresholds based on threats to structures
- Flood Inundation Mapping Tools
 - Input Stream Gauge Stage
 - Detailed Models
 - Rating Curves
 - Percent Annual Chance raster
 - Structure Impact Analysis
 - Flood Prone Buildings with Elevations
 - Road Crossings and Segments



July 8th Time	Alarm Location
13:15:00	Stage Event Wake-Up
13:20:00	NWS Severe Thunderstorm Warning
13:26:04	Rain Event Wake-Up
13:33:04	Brick Creek @ Monroe Road - ALERT
13:33:04	McMillen Creek at Addison Drive - INVESTIGATE
13:37:03	Little Sugar Creek @ East 36th Street - INVESTIGATE
13:38:00	NWS Flash Flood Warning
13:42:03	Brick Creek @ Providence Road - INVESTIGATE
13:43:03	Little Sugar Creek @ East 36th Street - ALERT
13:47:03	Little Sugar Creek @ Carolina Medical Center Drive - ALERT
13:47:04	Brick Creek @ Providence Road - ALERT
13:52:04	Little Sugar Creek @ Carolina Medical Center Drive - Investigate


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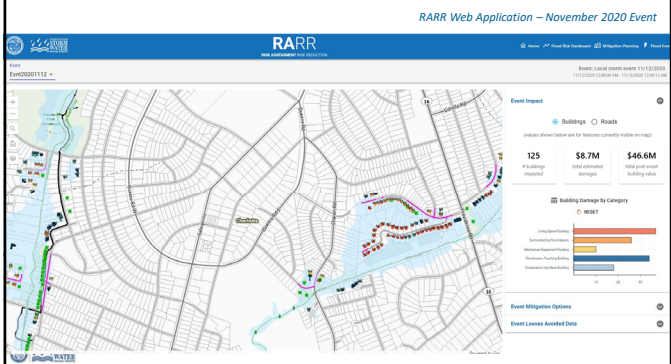
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Risk Assessment Risk Reduction (RARR) Storm Event Tools

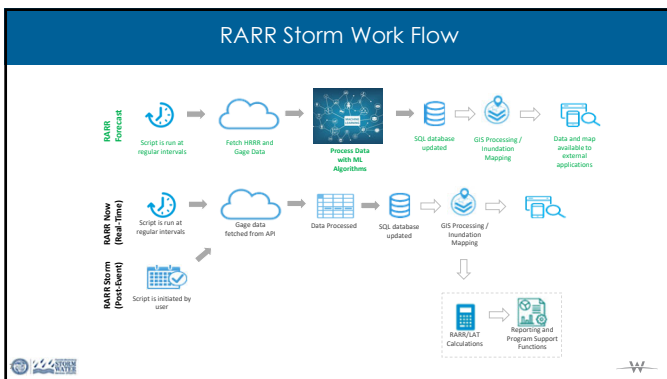
- Mecklenburg County has a sophisticated technology framework to map and quantify flooding during storm events
- Technology Framework:
 - Hardware – gauges and low-cost sensors to obtain real-time stream information
 - Communications technology – send/manage gauge information (Contrail)
 - GIS Tools/Databases – extract, process, map, and manage storm data
 - Web Application – visualize/communicate impacts (RARR)
- This effort extends the functionality of existing framework by integrating with a predictive element
 - Key input is forecasted stream stage at existing gauge/sensor locations
 - Leverage existing framework to do the rest



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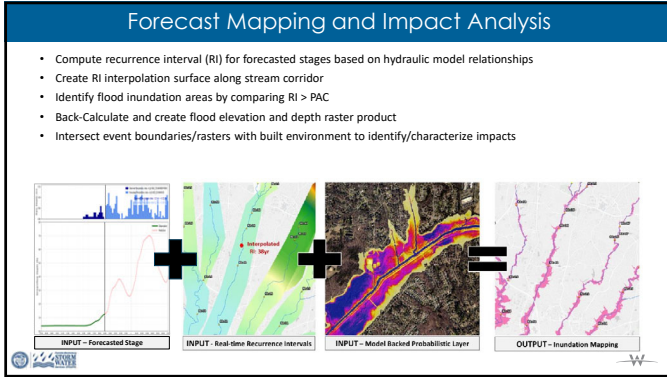
Why Flood Forecasting

- “Missing Piece of Puzzle” for FINS
 - Early Warning
 - Near Realtime Monitoring
 - Hindcast with detailed Impacts
- Amount of Data
 - Number of Gauges/Sensors
 - Long Data History
 - Detailed Models
- Inundation Tools
 - Generates accurate mapping with Stage input

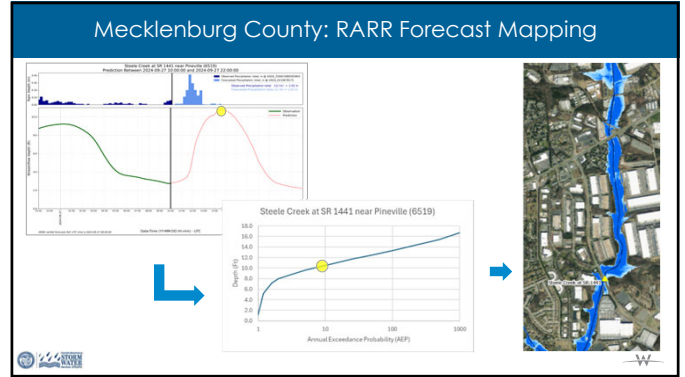


Address	FEMA Stream	Flood Category
9432 SOUTHERN PINE BV	Sugar Creek	3: Floodwaters Very Near Building
9493 SUMMERFIELD LN	Traverse Creek	4: Floodwaters Touching Building
727 BRIAN CR	Sugar Creek	1: Living Space Flooding
1315 SPRUCE ST	Irwin Creek	2: Surrounded by Flood Waters
1919 BANGOR RD	Sugar Creek	5: Mechanical Equipment Flooding

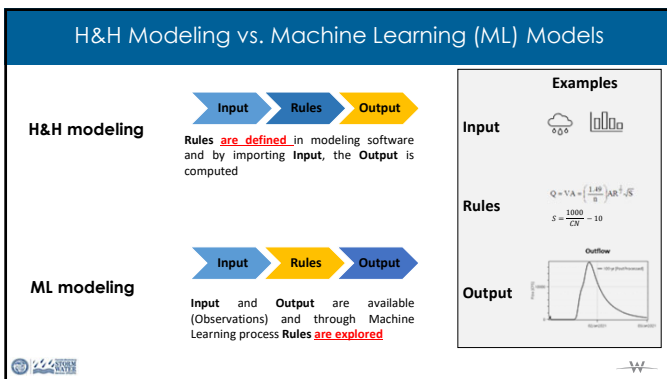
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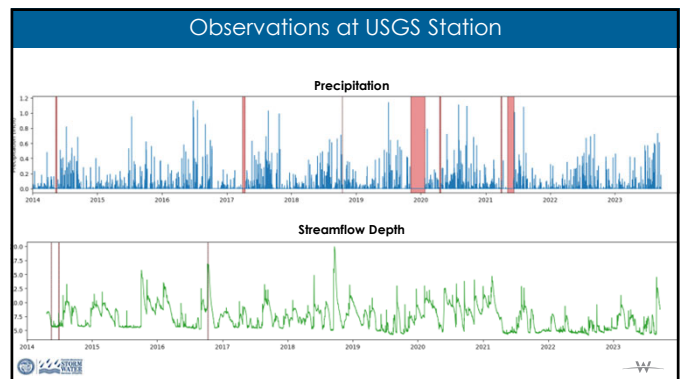
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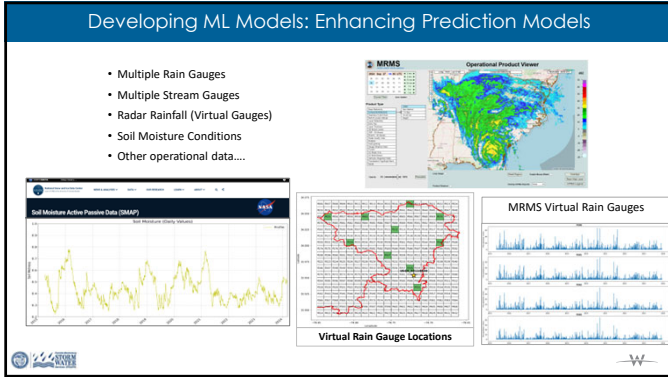
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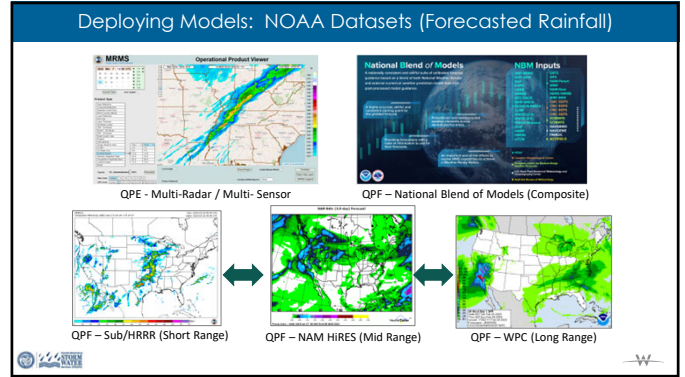
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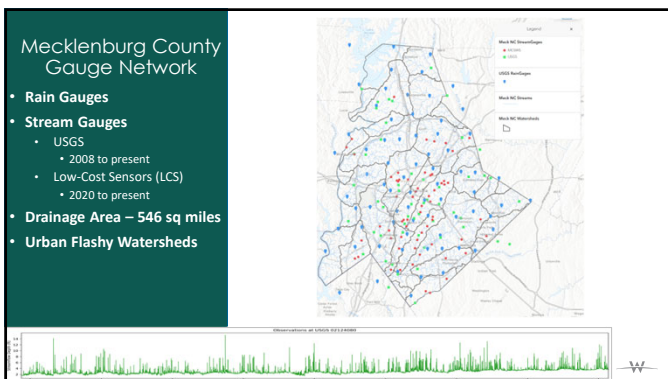
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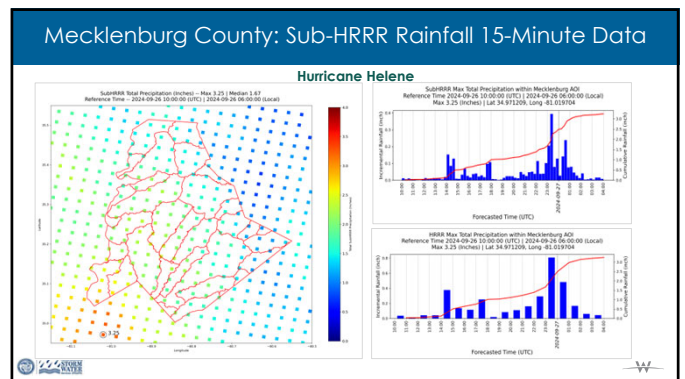
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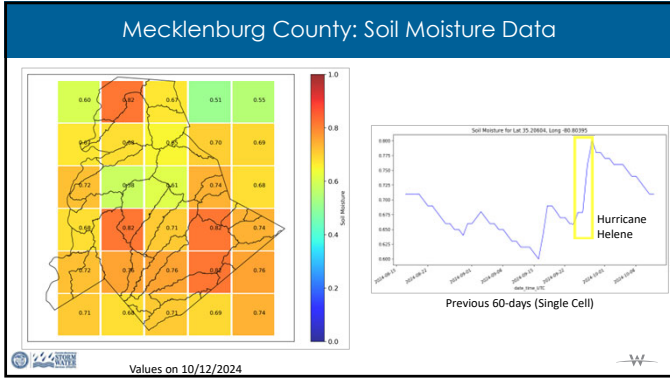
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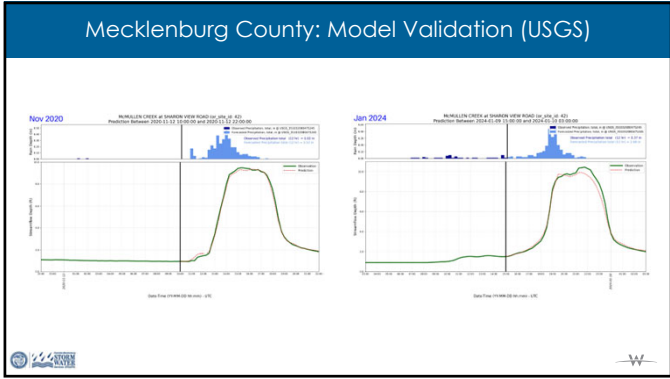
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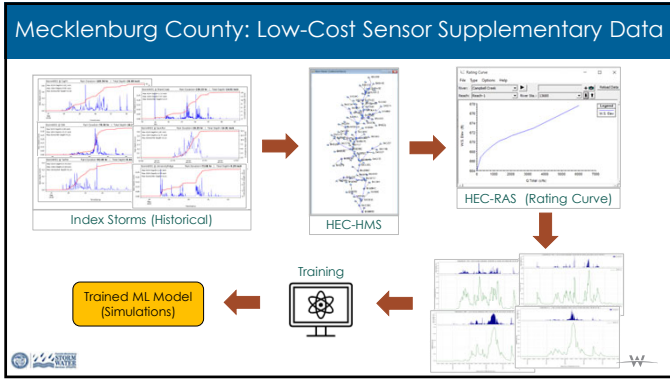
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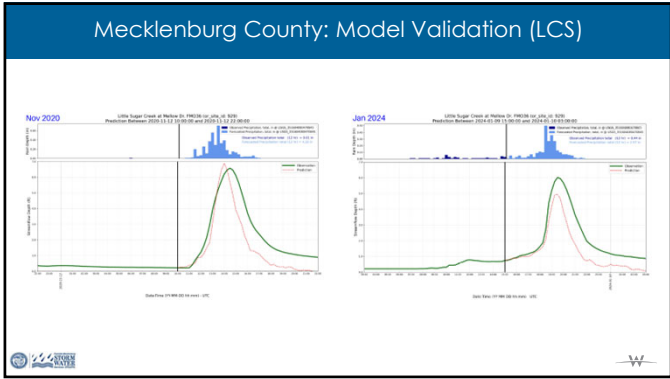
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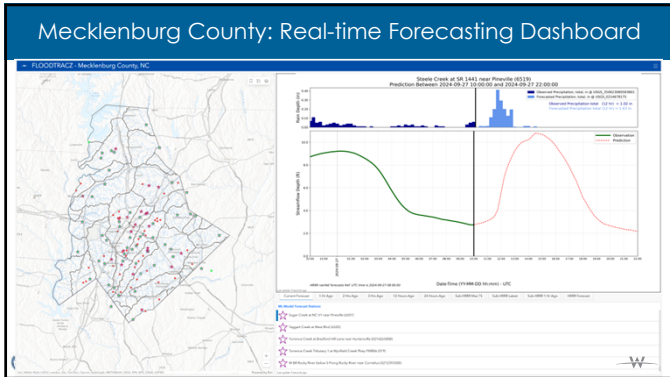
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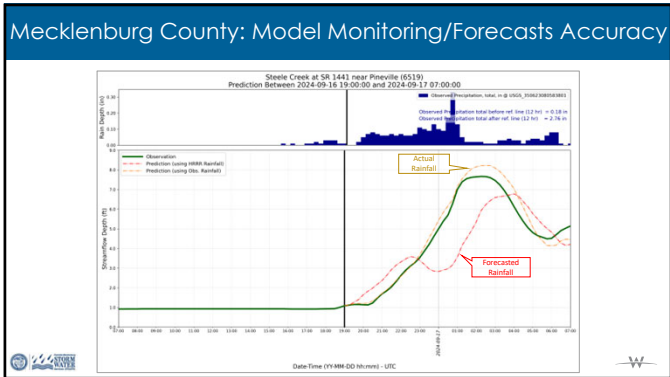
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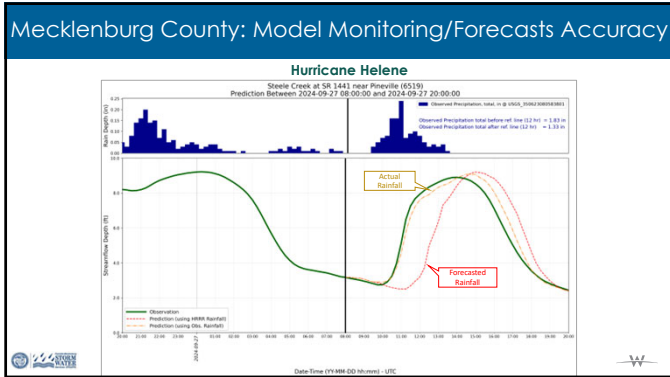
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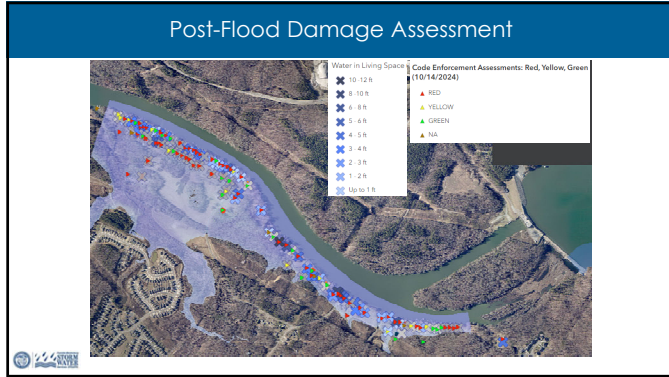
Post-Flood Damage Assessment

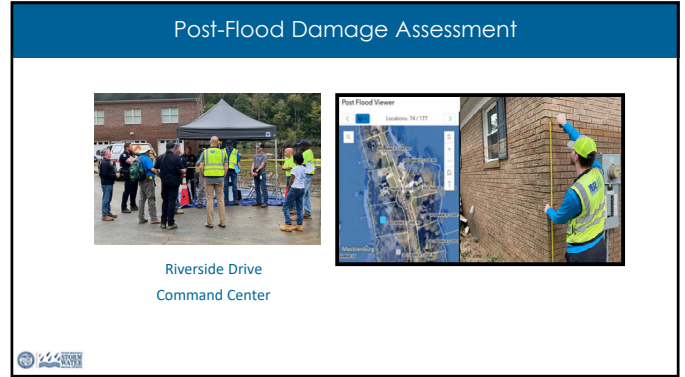
Mountain Island Lake (MIL)

- 7.9 ft of water above spillway at peak
- 4 ft of water on homes in lower MIL
- 14+ ft of water on downstream homes.

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Next Steps

- Expand alerting thresholds to each sensor
- Develop evaluation system of forecast accuracy
 - Forecast Stage as compared to Observed Stage
- Identify alternatives for rainfall forecasts
 - Free data from NWS vs a paid subscription to a vendor

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2027 Hydrologic Warning Conference, Charlotte, NC

Visit nhwconference.org for more details

Call for Proposals & Early Bird Registration opens on August 1, 2026

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