



## **NORTH CAROLINA**

Department of Transportation



# Hurricane Florence

## Lessons Learned from Previous Storms

Preston Hunter, PE - Division 2 Engineer

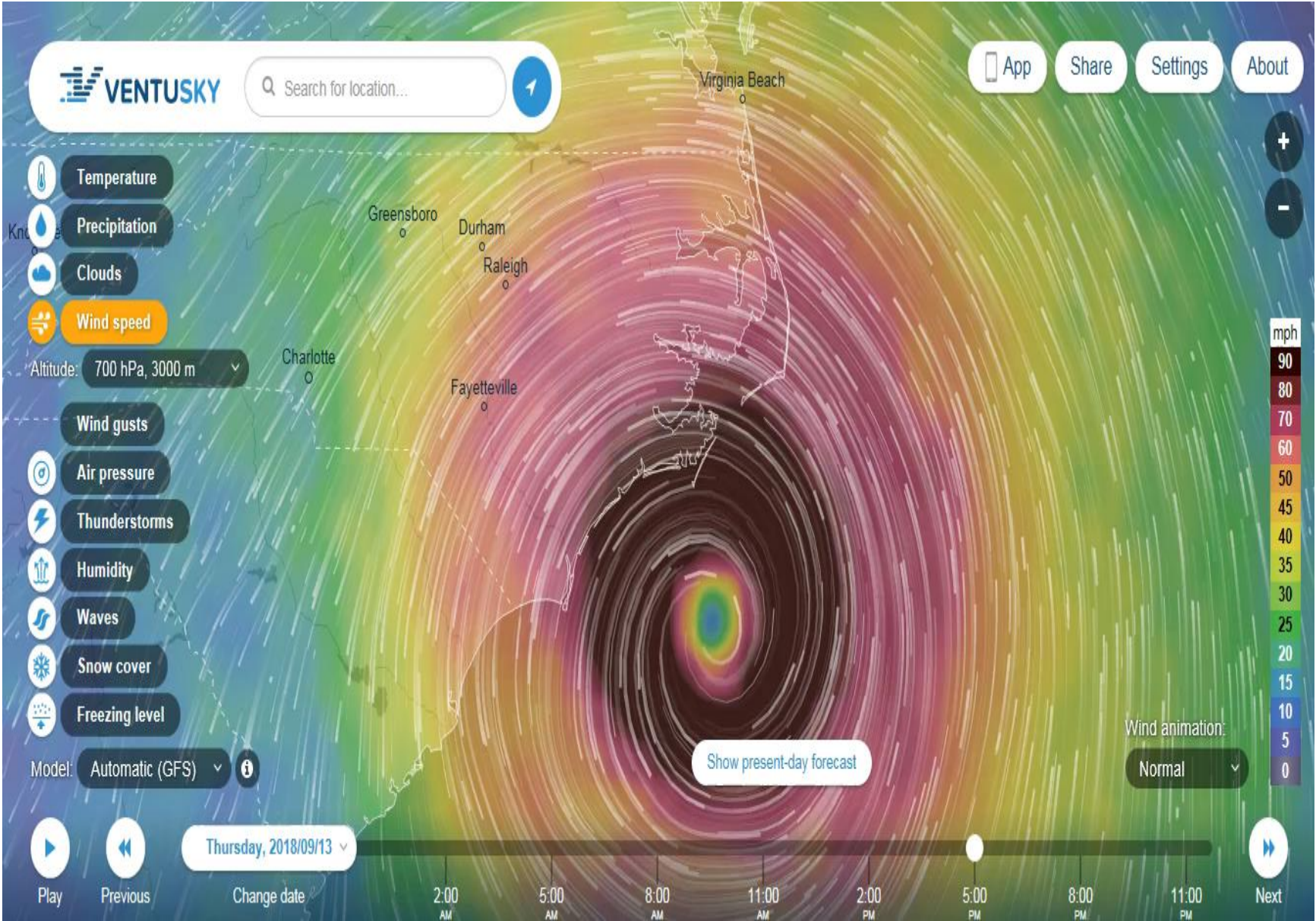
October 3, 2018

# Storm Surge on Inland Rivers

- Hurricane Irene
  - Record surge in the Pamlico River
    - Belhaven
    - Bath
- Hurricane Florence
  - Record surge in the Neuse River
    - Craven County
    - Pamlico County









# New Bern, NC



# Flooding along the Neuse and Trent River Basins

- Hurricanes Floyd, Matthew, and Florence

- Record Rainfalls

- Floyd 15-20 inches
- Matthew 12-18 inches
- Florence 20-30 inches



- Record River Cresting

	<u>Neuse River in Kinston</u>	<u>Trent River in Trenton</u>
• Floyd	27.71 ft	28.42 ft
• Matthew	28.31 ft	14.53 ft
• Florence	25.9 ft	29.28 ft



# US-70 – Kinston, NC



# Lessons Learned From Previous Storms

- Road Clearing
- Debris Removal
- Multi Agency Coordination
- Communications
- New Technology

# Road Clearing and Debris Removal

- Cut and Shove Operations
  - Utilization of contract crews
  - Preposition contracts





# Road Clearing and Debris Removal

- Debris Removal
  - Utilization of Contracting Industry
  - Early Damage Estimates
  - Intermediate Completion Dates
  - Coordination with Local Governments



# Multi Agency Coordination

- County Government
  - Utilization of Facilities
    - Jones County Maintenance Facility
    - Pitt County Maintenance Facility
    - Craven County Maintenance Facility
  - Staffing at County Emergency Operations

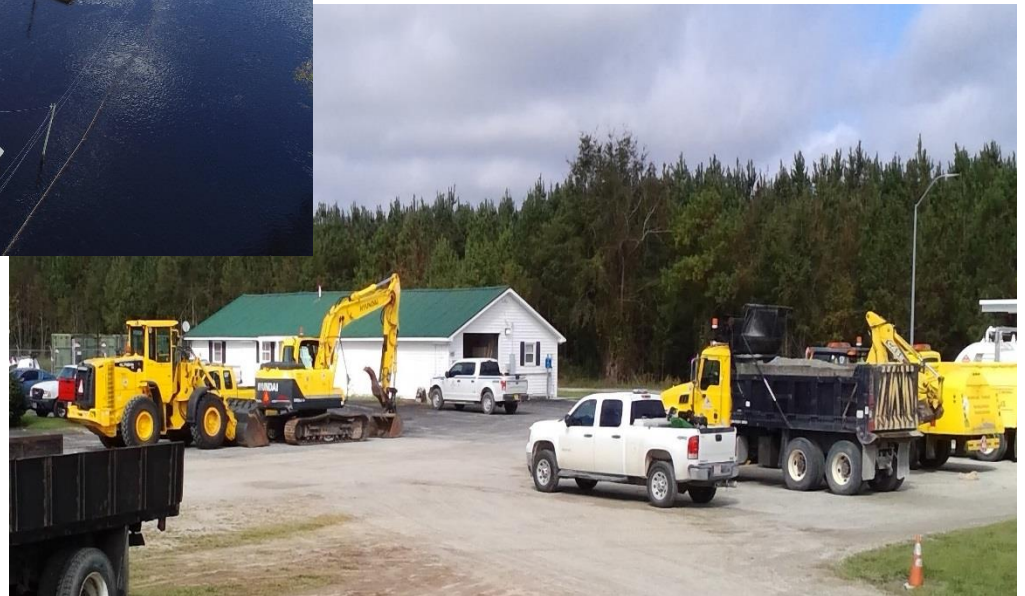


# Trenton Maintenance Yard



Flooding of Maintenance Yard

Temporary Office at Jones County  
Government Property





# Multi Agency Coordination

- **North Carolina Highway Patrol**
  - Assisting with Road Closures
  - Manning and Monitoring Barricades
- **North Carolina GTP**
  - Staging of Materials
  - Housing for Employees
- **Volunteer Fire Departments**
  - Clearing Roadways



# Communications

- Daily Division Conference Calls
- Use of Satellite Phones
- VIPER Radios



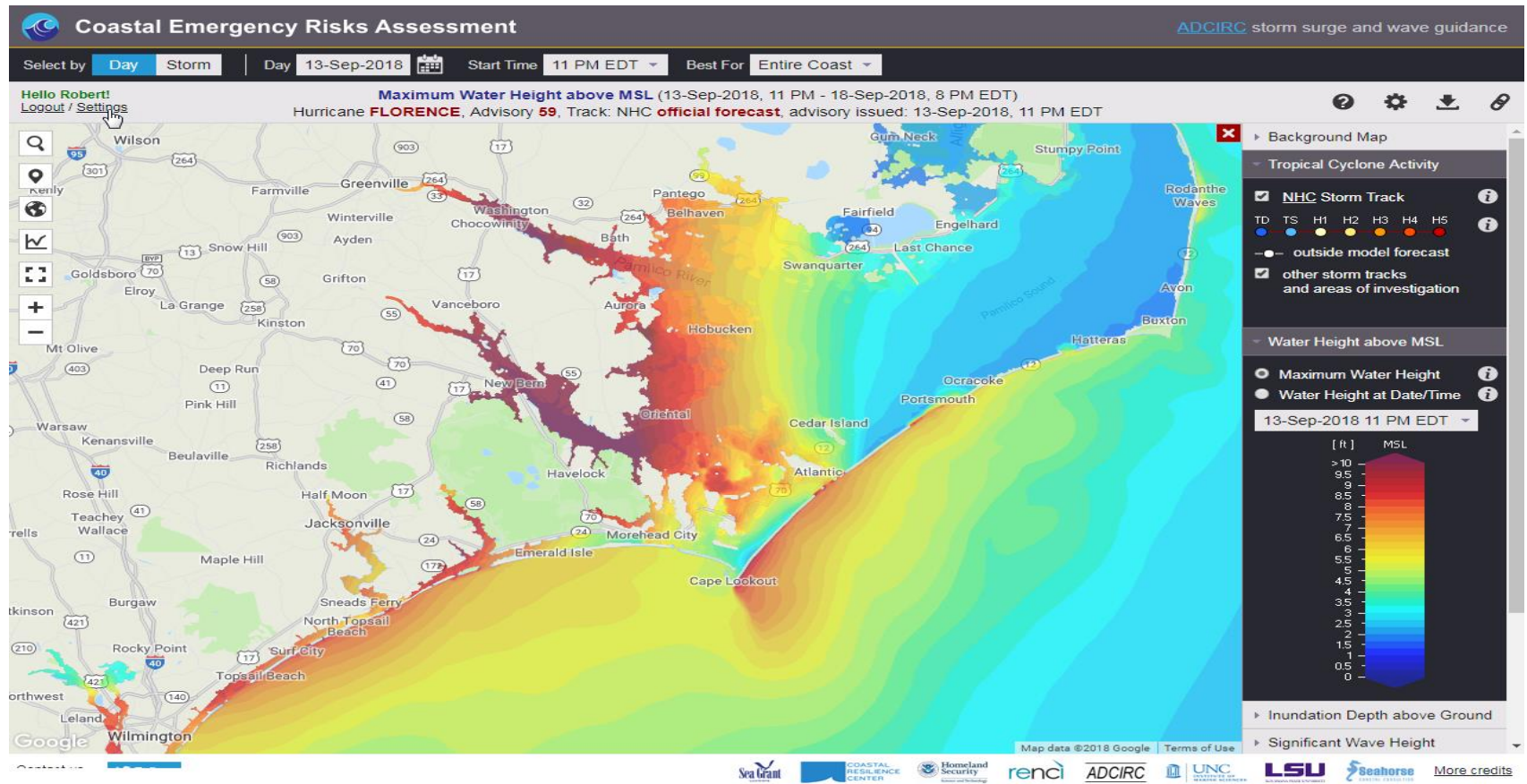
# New Technology

- Coastal Emergency Risks Assessment Software
- USGS Gauging Stations
- National Weather Service River Predictions



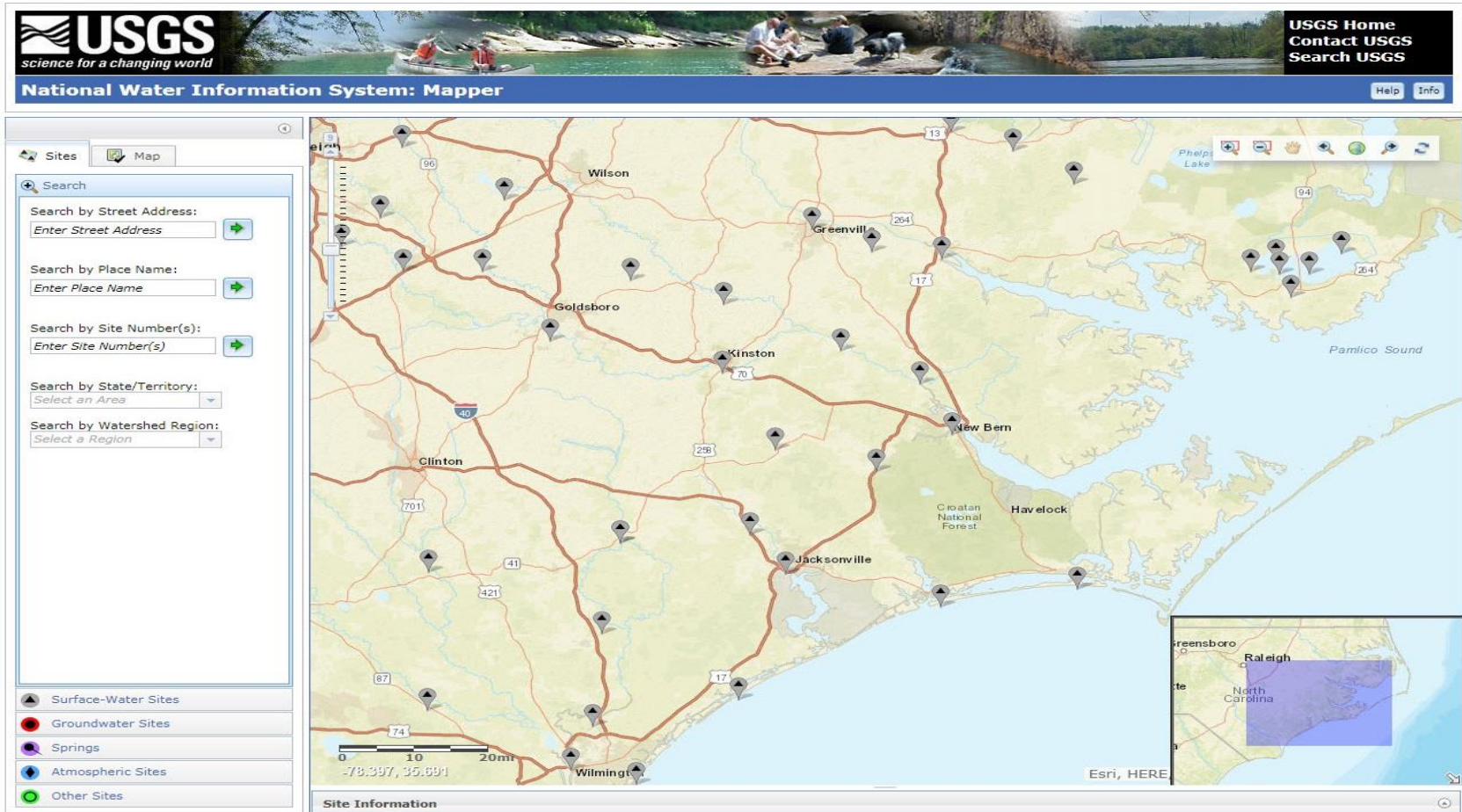
# Tools for Predicting Storm Surge

- ADCIRC storm surge predictions available via Coastal Emergency Risks Assessment



# Predicting River Cresting Elevations

- USGS Gauging stations along major streams and rivers



# Predicting River Cresting Elevations

## – National Weather Service

- Advanced Hydrologic Prediction Service

