

# Dare County Preliminary Flood Insurance Rate Map Meeting

June 20, 2016



Who are today's attendees?

# The Purpose of this meeting

- ⦿ Release updated digital flood hazard data
- ⦿ Explain the post-preliminary process
  - Review of data, and submittal of appeals/comments
  - Amending your Ordinance to incorporate the new data into your Floodplain Management program
- ⦿ Peripheral NFIP issues
  - \* issues

# Why were you invited today?

- \* State flood hazard data is provided in seamless paneling scheme; your community has updated data
- \* Flood hazard data is now released digitally (no hard copies are provided, unless requested)
- \* Local staff involved in floodplain management
  - \* Floodplain Administrator
  - \* GIS staff
  - \* Elected officials

# AGENDA



- \* Digital Flood Hazard Data
- \* Post-Preliminary Process
- \* Revision Results for Dare County
- \* Impact on Insurance Rates
- \* Floodplain Management Standards
- \* Impact of New Maps
- \* FRIS - <http://fris.nc.gov/fris/>



# PURPOSE OF NFIP

- \* To make flood insurance available
- \* To identify floodplains and areas at risk of flooding
- \* To provide standards, guidance, and a framework to help communities manage floodplains

# DEFINITIONS

- \* **Flood Insurance Rate Map (FIRM)**
  - \* A digitally-produced FIRM, whether viewed in hardcopy or in digital form
  - \* All FIRMs produced by the North Carolina Floodplain Mapping Program are digital FIRMs
- \* **Flood Insurance Study (FIS)**
  - \* Details the examination, evaluation, and determination of flood hazard areas
  - \* FIRMs are part of the FIS
- \* **Base Flood Elevation (BFE)**
  - \* On the FIRM, viewed in the FRIS 'point and click' this is shown to the nearest 0.1' of a foot of the 1% annual chance flood
  - \* Regulated to the nearest tenth of a foot; detailed information provided in the FIS and displayed on the FRIS

# DEFINITIONS

- \* Special Flood Hazard Area (SFHA)
  - \* The 1% annual chance floodplain, where NFIP regulations must be enforced by the community as a condition of participation in the NFIP
- \* Floodway (and Non-Encroachment Area)
  - \* The portion of the SFHA, including the channel of a river or other watercourse, that must be reserved (free of obstruction) in order to allow the discharge of the base flood without increasing the water-surface elevation more than one foot at any point along the stream

# MINIMUM FLOODPLAIN REGULATIONS UNDER THE NFIP

- \* Elevate all structures in SFHAs to at least the BFE published by FEMA (non-residential structures in A Zones may flood-proof in lieu of elevation)
- \* Protect all utility systems to at least the BFE published by FEMA
- \* Prohibit encroachment/development in the floodways and non-encroachment areas

# COMMUNITY RATING SYSTEM

- ⦿ Voluntary incentive program that rewards floodplain management initiatives that exceed the minimum NFIP requirements
- ⦿ Three goals:
  - \* Reduce flood losses
  - \* Facilitate accurate insurance rating
  - \* Promote the awareness of flood insurance
- ⦿ Initiatives that meet these 3 goals can result in reduced flood insurance premiums for citizens
- ⦿ All Dare County communities participate in the CRS

# COMMUNITY RATING SYSTEM

| <u>Community</u> | <u>Class</u> | <u>Discount</u> |
|------------------|--------------|-----------------|
| Dare County      | 8            | 10%             |
| Duck             | 7            | 15%             |
| Kill Devil Hills | 6            | 20%             |
| Kitty Hawk       | 6            | 20%             |
| Manteo           | 8            | 10%             |
| Nags Head        | 6            | 20%             |
| Southern Shores  | 7            | 15%             |

# Digital Flood Hazard Data

# Why Digital Flood Hazard Data?

- Industry and general population working in digital environment
- Easier to understand (single source for all data) with 24/7 access
- Much cheaper to develop and distribute
- Data adds value to other digital layers and data sets
  - Enhances comprehensive land use planning
  - Increasingly vital tool for Emergency Managers, aids in preparing and responding to natural disasters

# Flood Data in Digital Database Format

- \* Key Elements of the data include:
  - \* Zone designations
  - \* Base Flood Elevations
  - \* Depth of water elevations on buildings
- \* Print-on-demand available
  - \* Flood Information Study (FIS)
  - \* Flood Insurance Rate Maps (FIRMs)
- \* FRIS shows updated Panels with **Green** Borders; effective panels shaded out in the “Preliminary” view

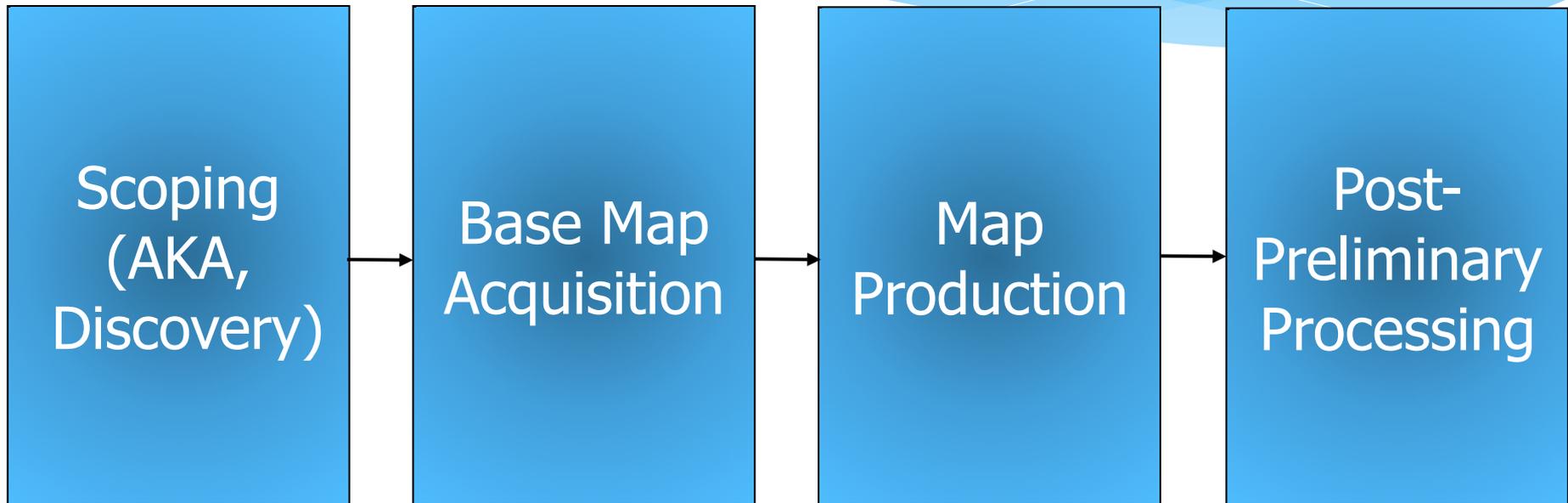
# Digital Display Environment

- \* Changes from older versions include:
  - \* Point-and-click BFEs; no BFEs on paper
  - \* No profiles; no interpolations of BFEs
  - \* Color scheme changes: 0.2% is now shown in yellow
  - \* Fewer labels; need to zoom in to populate more
  - \* View 'Changes since last FIRM' (layer)
- \* Map Export to either Regulatory or Current View
- \* FIS on the fly; print only what you need

# The Post-Preliminary Process

The slide features a solid blue background. At the bottom, there are several overlapping, wavy, light blue shapes that create a sense of movement or a horizon line.

# MAPPING PROCESS



# POST-PRELIMINARY PROCESSING

- ◎ Preliminary panels are issued
  - \* 2 notices in local newspaper
- ◎ 90-day Appeal/Comment Period
  - \* Educational/Public Outreach Meetings
- ◎ Resolution of Appeals and Comments
- ◎ The 6-month Compliance Period
  - \* Letter of Final Determination from FEMA
  - \* Map Adoption and Update of Flood Damage Prevention Ordinance

# POST-PRELIMINARY PROCESSING

- ⦿ Preliminary flood hazard data for Dare County will be provided as a link in the mailed Preliminary Issuance letter on **June 30, 2016**
- ⦿ 90-Day Appeal/Comment Period: **TBD**
- ⦿ Preliminary FIRM Meeting: June 20, 2016
- ⦿ Public Participation Meeting: TBD; need to schedule
  - \* Opportunity for public to view, comment on, and ask questions about the new FIRMs

# POST-PRELIMINARY PROCESSING

- ⦿ Engineering models are made available to county and incorporated communities **after maps are released preliminary. Earlier on a case by case basis**
- ⦿ Models are made available to public, including citizens, businesses, and other private entities **after maps are released preliminary.**

# POST-PRELIMINARY PROCESSING

## Local Responsibilities

- ⦿ Direct citizens to FRIS for preliminary data
- ⦿ Publicize a Public Participation Meeting
- ⦿ Review Preliminary Data for errors and missing information within the 90-day review period
- ⦿ Forward any appeals or comments from the public and local officials to the state and FEMA
- ⦿ Adopt Flood Study under Ordinance

# POST-PRELIMINARY PROCESSING

## Appeals

- \* An appeal is a formal objection to new or revised BFEs, SFHA and Floodway boundaries in the preliminary data that is submitted during the 90-day appeal period
- \* Appeals are based on data that show proposed BFEs to be scientifically or technically incorrect

*See Expanded Appeals Process Fact Sheet  
for additional information and online resources*

# Expanded Appeals Process

- \* Due Process required for all proposed changes in the SFHA with possible insurance impacts; now includes:
  - \* Changes to BFE
  - \* Modification of any SFHA boundary
  - \* Zone designations
  - \* Floodway boundaries (increases and decreases in extent)

Scientific and/or Technical data still required as part of an Appeal

# POST-PRELIMINARY PROCESSING

## Comments

- ⦿ A comment is a formal objection to the information in the FIS Report and/or shown on the FIRM panels not related to BFEs
- ⦿ Comments generally involve concerns regarding the corporate limits, Extraterritorial Jurisdiction (ETJ) boundaries, and road names or locations

# POST-PRELIMINARY PROCESSING

## Appeals & Comments

### SUBMIT TO:

\* John Dorman, Director  
NCFMP  
4218 Mail Service Center  
Raleigh, NC 27699-4218  
(919) 715-5711

\* Luis Rodriguez, Chief  
Engineering Management Branch  
Federal Insurance and Mitigation  
Administration  
FEMA  
500 C Street, S.W., Room 423  
Washington, D.C. 20472  
(202) 646-4064

The appeal period for Dare County is  
Yet to be Determined

# Resolution of Appeals and Comments

- \* NCFMP/FEMA notifies CEO and Appellant of receipt
- \* Supporting Data is reviewed for validity
  - \* Additional supporting data may be requested
- \* NCFMP/FEMA notifies CEO and Appellant of resolution
  - \* Provided with revised FIS/FIRMs
  - \* The Community has 30 days to review and comment
- \* FEMA issues final letter of determination (LFD)
- \* If appellant and NCFMP/FEMA cannot agree on the resolution, appellant can request a Scientific Review Panel (SRP)

# POST-PRELIMINARY PROCESSING

## Effective Date

- \* Changes to the preliminary flood data [i.e. flood zones, boundaries and base flood elevations] will not affect flood insurance policies until the **effective** date of the FIS
- \* This date will be established by FEMA through the Letter of Final Determination (LFD) once submitted appeals and comments are evaluated and resolved

# POST-PRELIMINARY PROCESSING

## Local Responsibilities

- \* North Carolina Map Adoption
  - \* Board of Commissioners / City Council shall hold a Public Hearing on the new FIRM and/or FIS Report
  - \* Notice of the hearing shall be published once a week for two consecutive weeks between 10 and 25 days from the date of the hearing
  - \* Communities must amend their Flood Damage Prevention Ordinances every time FEMA revises the FIRM and/or FIS Report for that community
  - \* NCFMP staff available for guidance through this process and for support at Public Hearings

# POST-PRELIMINARY PROCESSING

## Local Responsibilities

### ⦿ North Carolina Map Adoption (cont.)

- \* Ordinances should be revised to reference an updated FIS Report the community is shown on even if the revisions are outside their corporate limits
- \* Requirements place a significant burden on communities as some may have to adopt new FIS Reports and update their ordinances multiple times per year

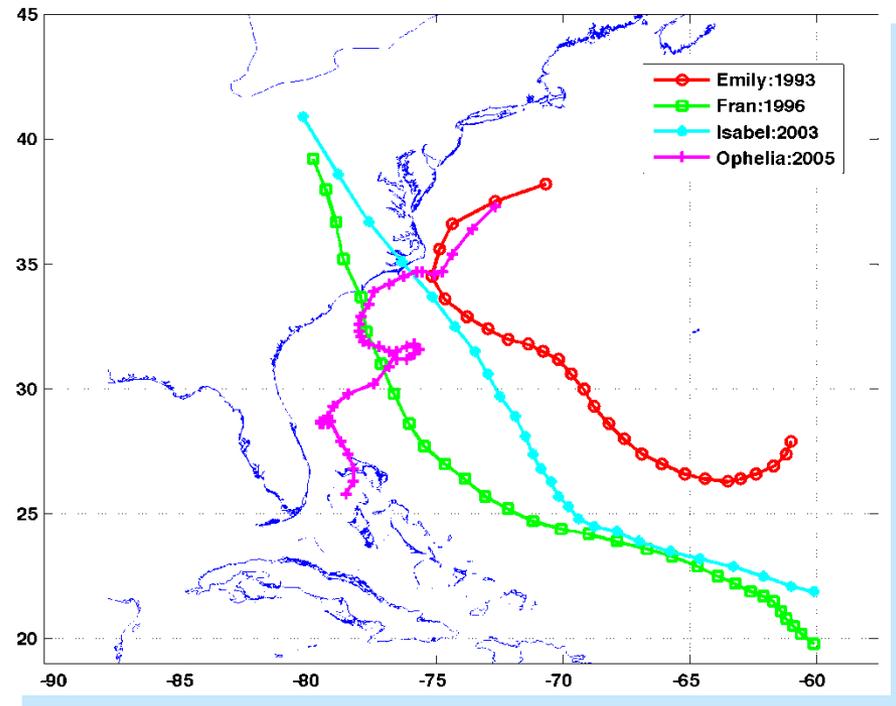
*See revised North Carolina model ordinance language*

# Coastal Flood Hazard Analyses



# Context for the New Study

- \* Current Effective Studies (Details in FIS)
  - \* No Surge Updates (Surge performed in 1981)
  - \* Added single wave setup value for some counties
  - \* New overland wave analyses in some counties
- \* Reason for Update
  - \* Advances in coastal surge modeling methods
  - \* Significant Surge Events since 1980 (Emily, Fran, Isabel, Ophella)
  - \* Changes in FEMA Coastal Mapping Guidelines (LIMWA and 2% Runup)



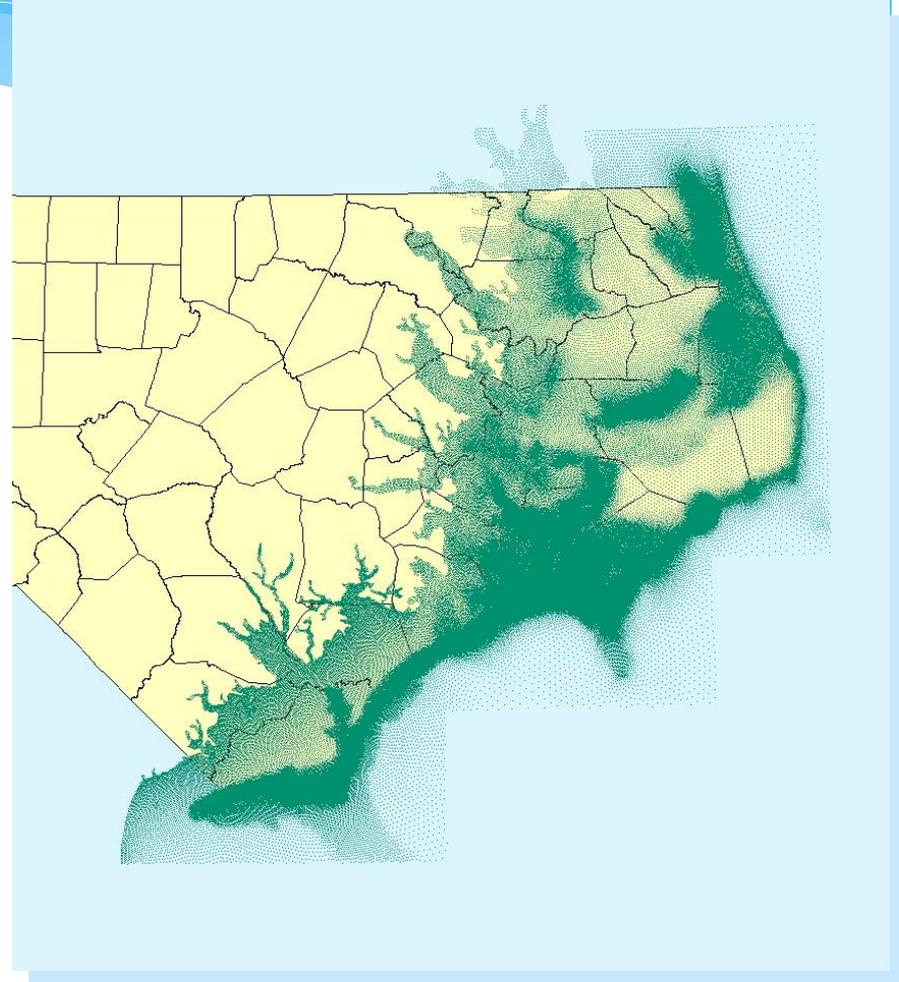
# NCFMP Coastal Restudy

## \* Scale

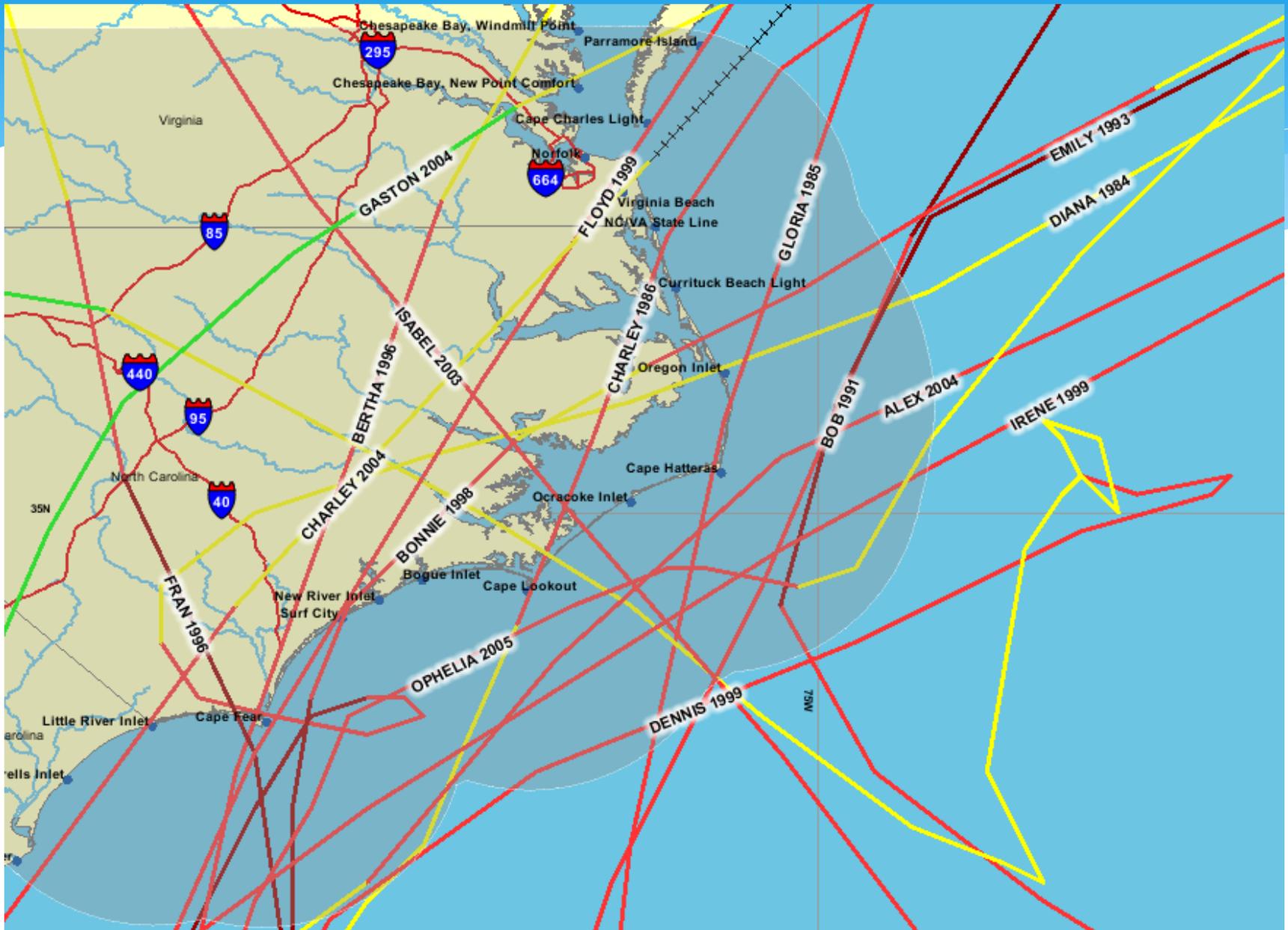
- \* Entire Coastline
  - \* Barrier Islands
  - \* “Closed Coast”
    - \* Bays – Ablemarle, Pamlico
    - \* ICW
    - \* Rivers

## \* Scope

- \* Storm Surge
- \* Onshore Wave Analysis
- \* DFIRM Production



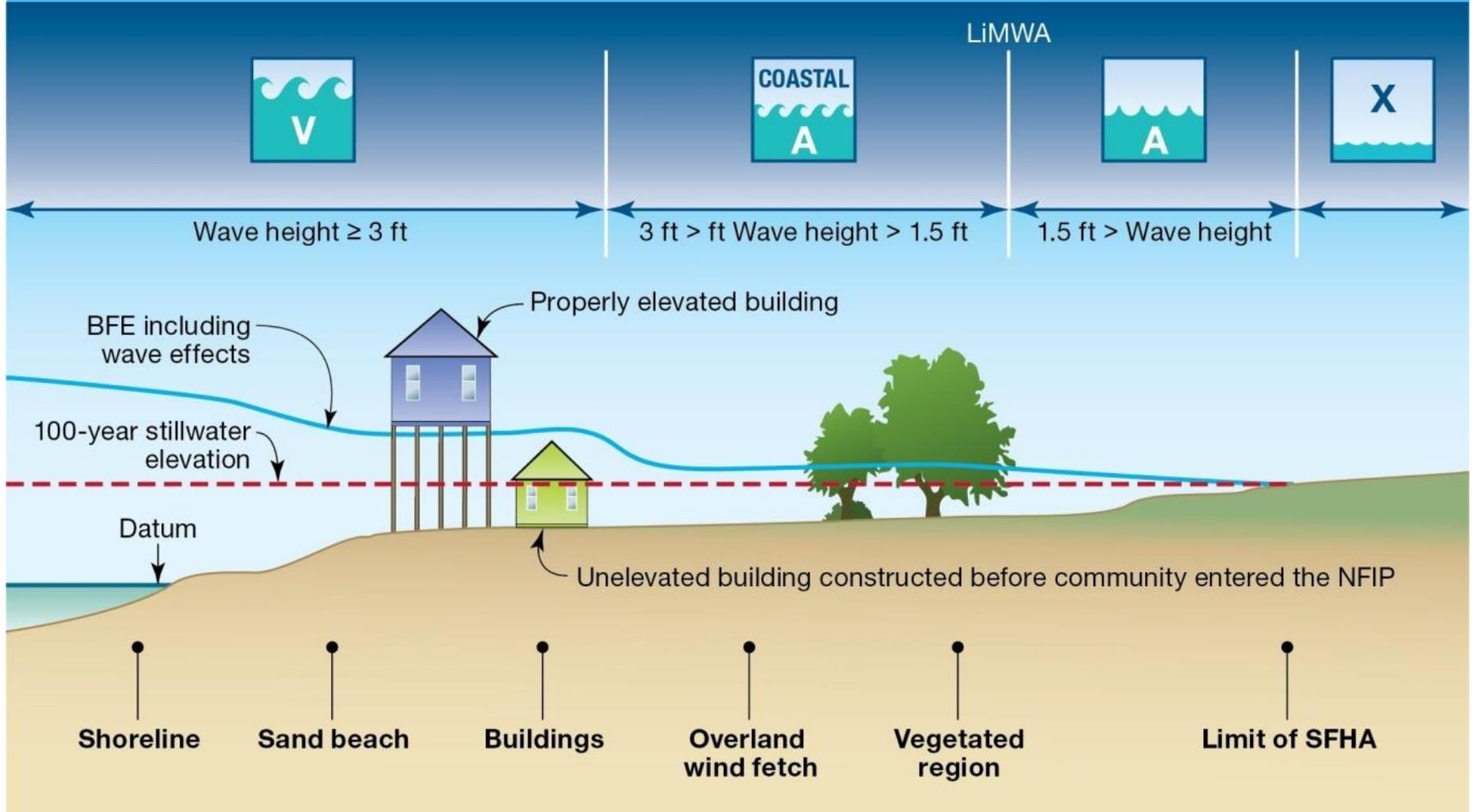
# 22 Hurricanes since 1980



# Coastal DFIRM Purpose

- \* Define 1% and 0.2% Flood Hazard Areas
  - \* Flood Insurance Ratings
  - \* Coastal Development Requirements
- \* Define Base Flood Elevations
- \* Map LIWMA
- \* CoBRA & OPA Zones

# Coastal Flood Hazards



# How a Coastal FIRM map is made?

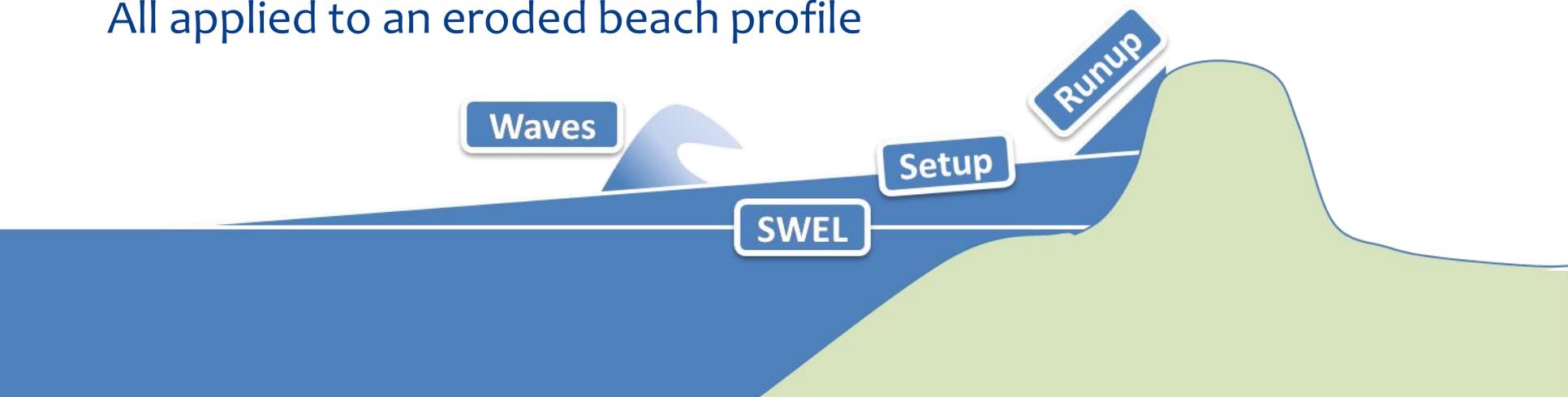
- Understand what causes coastal flooding
- Model the causes to determine the flood risk
- Map the flood risk

# FEMA Coastal Flood Hazards

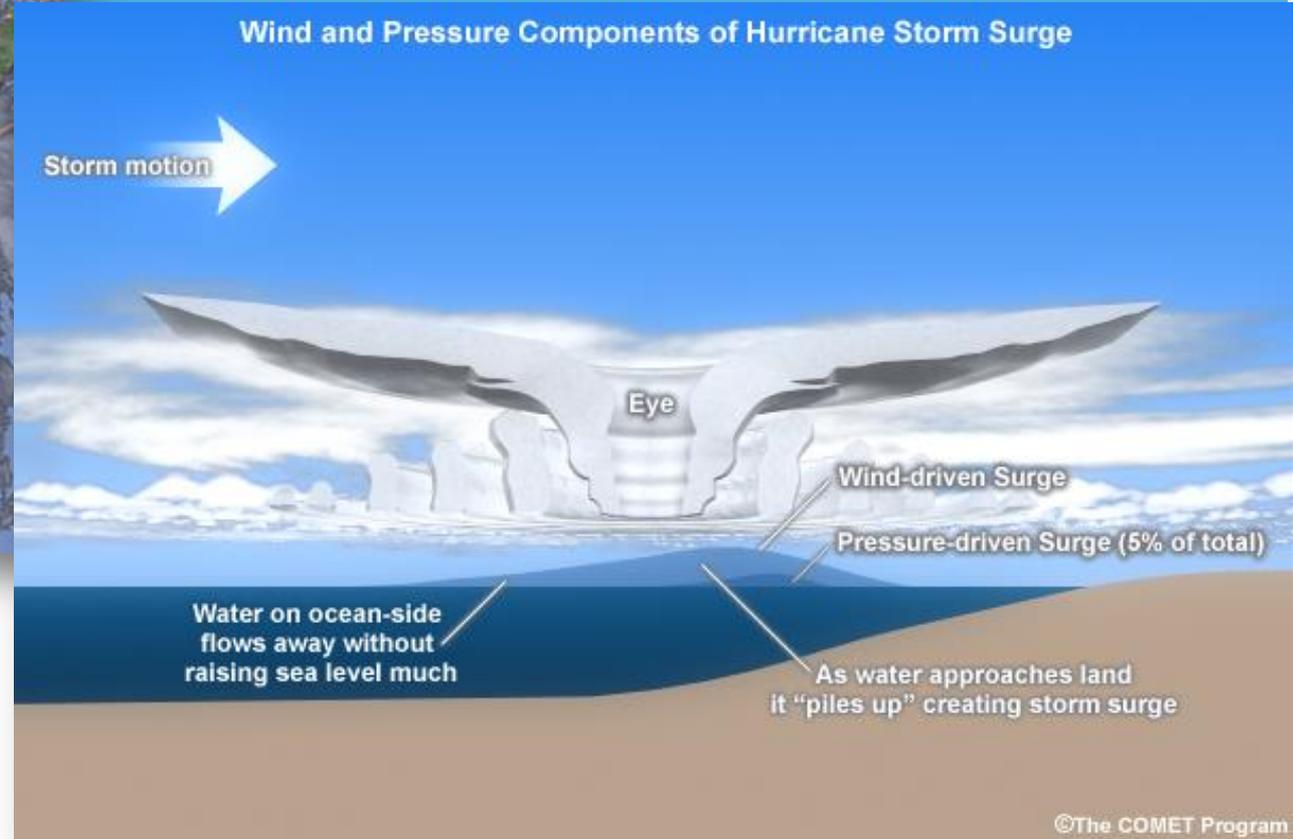
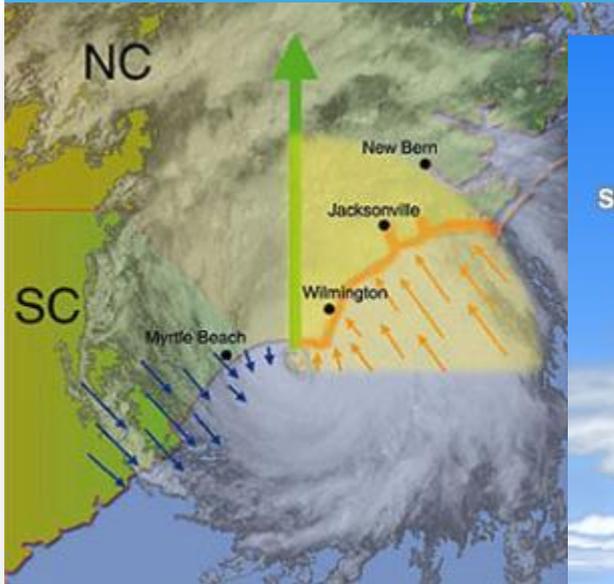
Base flood elevation (BFE) or regulatory water surface elevation on FIRM includes 4 components:

- Storm surge stillwater elevation (SWEL)
- Wave setup
- Wave height above storm surge elevation
- Wave runup above storm surge limits

All applied to an eroded beach profile

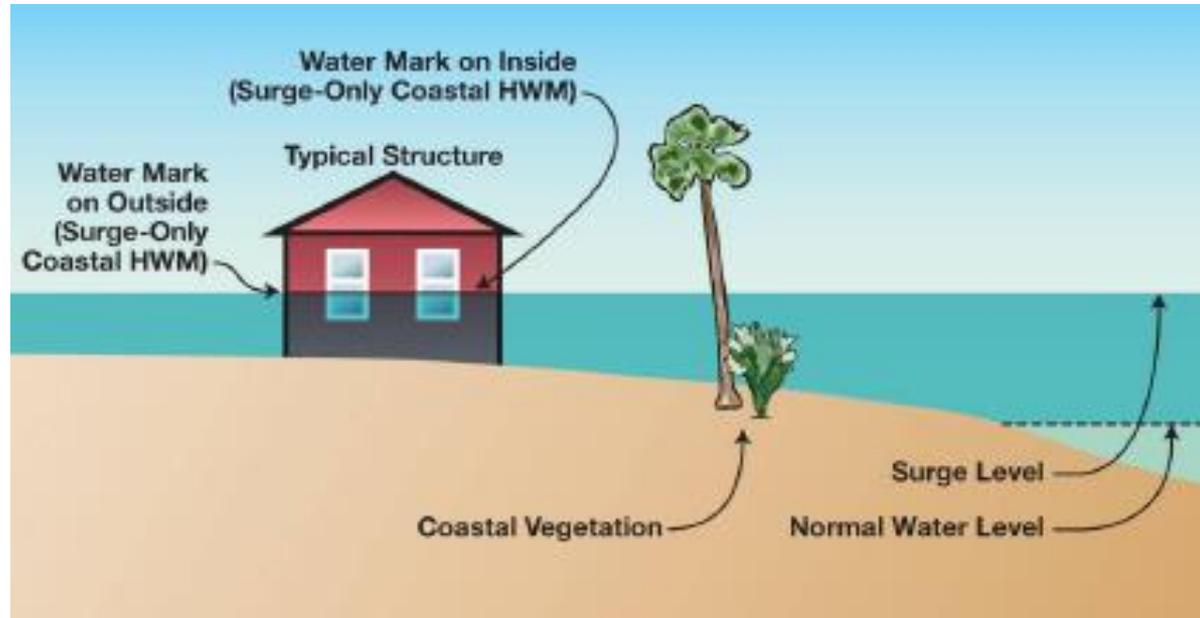


# Hurricane-driven Surge



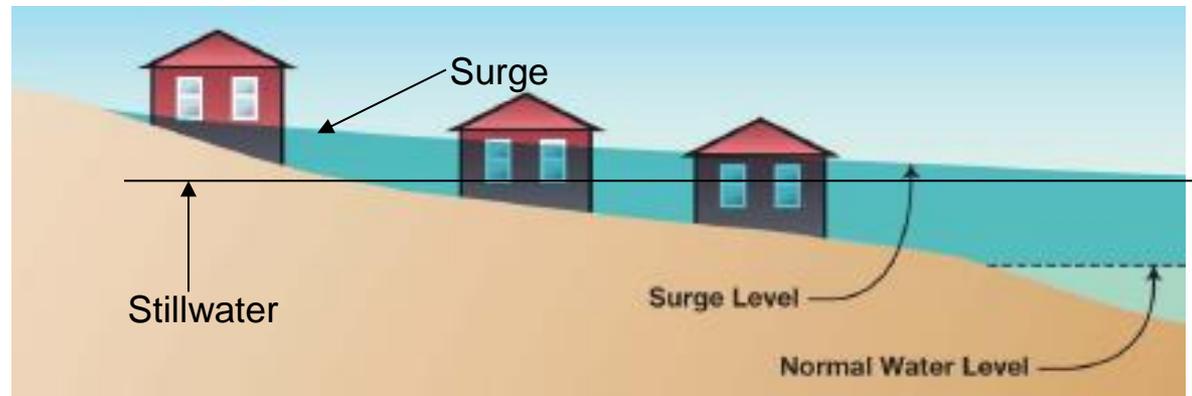
# What is Still Water?

- Rise in the normal water level of a coastal body.
- The increase in sea level by the water being pushed against the shore by an approaching storm.



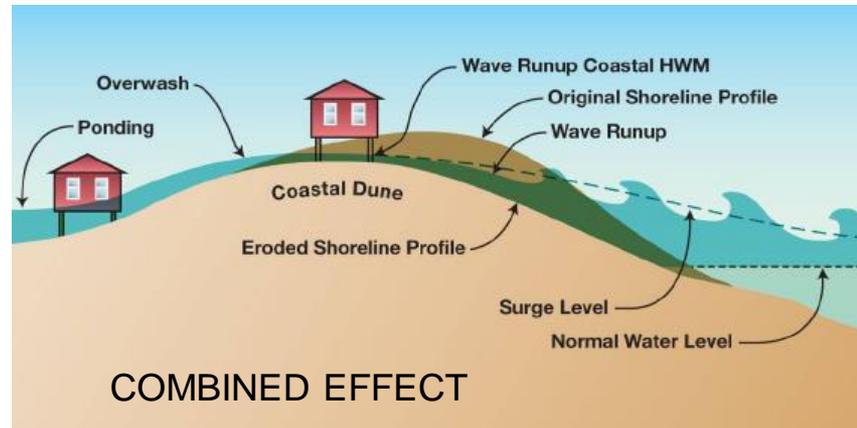
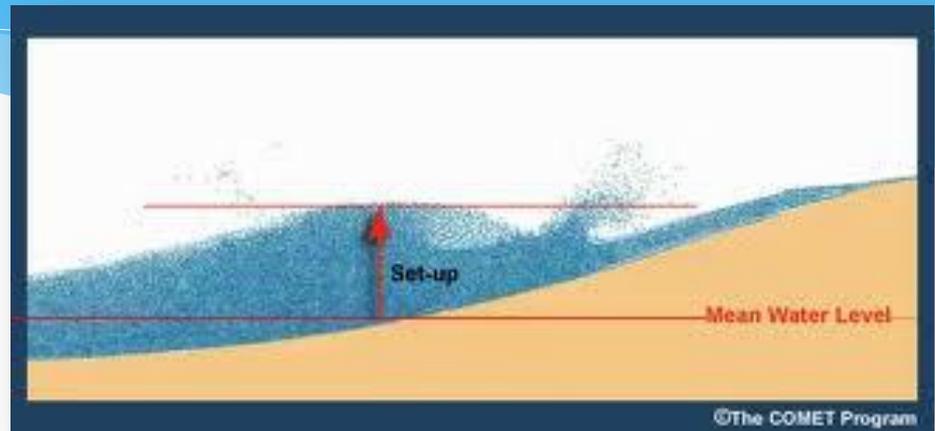
# What is Storm Surge?

- Increase in stillwater elevation caused by a strong onshore wind.
- Combined effect of the increase in sea level by the water being pushed against the shore by an approaching storm and the winds pushing against the shore.



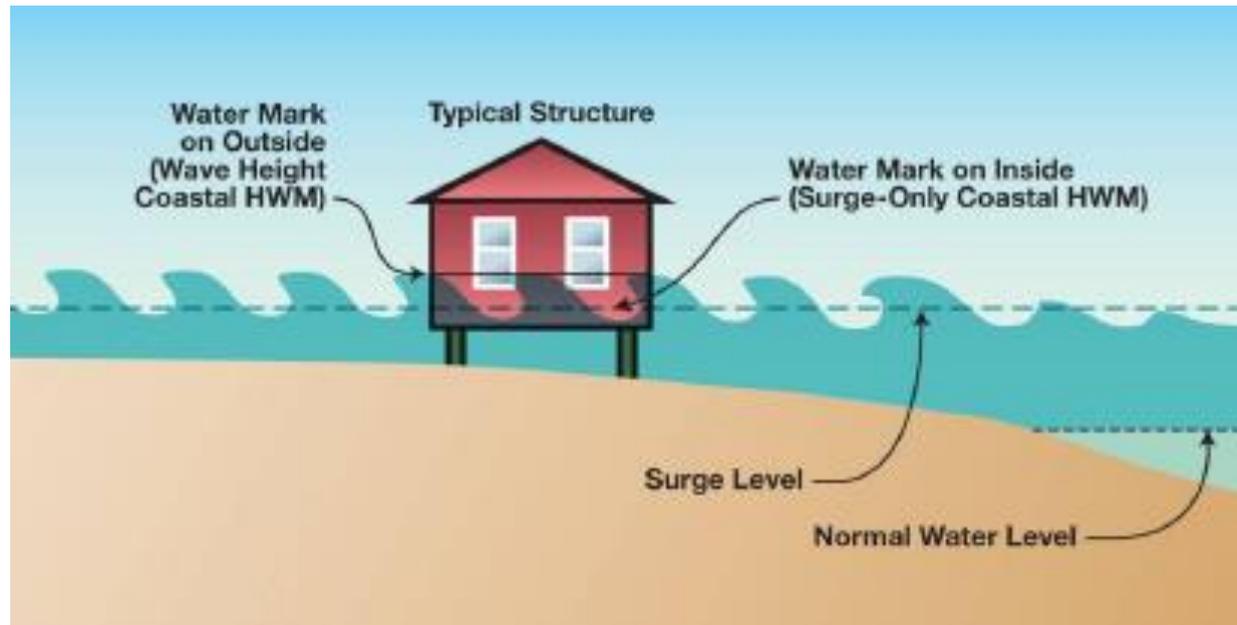
# Wave Effects - Setup

- Additional height of water due to effects of transferring wave related momentum to the surf zone.
- The height of water caused by waves coming in so quickly they pile up on each other before the water can recede.



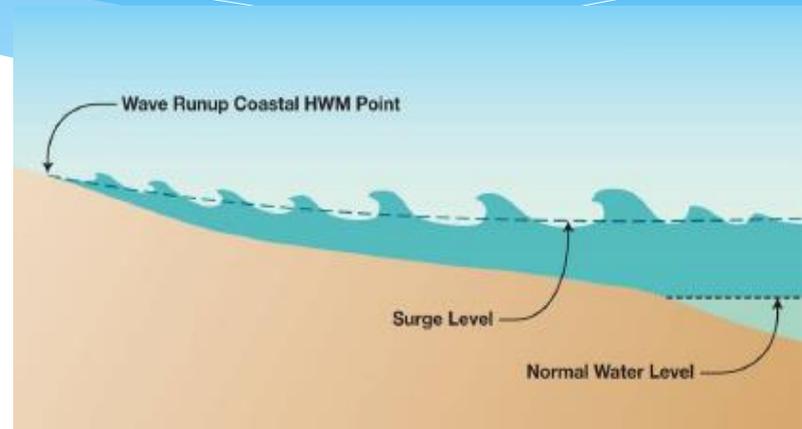
# Wave Effects

- VE Zone: zone with velocity hazard (wave action)
- VE Flood zone: BFEs where waves will be 3' or higher in the 100-year event.



# Wave Effects - Runup

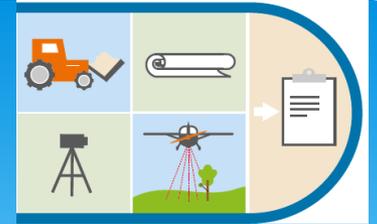
- Represents the height of water rise above the surge-only level due to water rush up from a breaking wave.
- Adds to the height of the surge and waves bringing damage to a higher elevation.



# Elements of the Coastal Flood Risk Analysis and Mapping Process

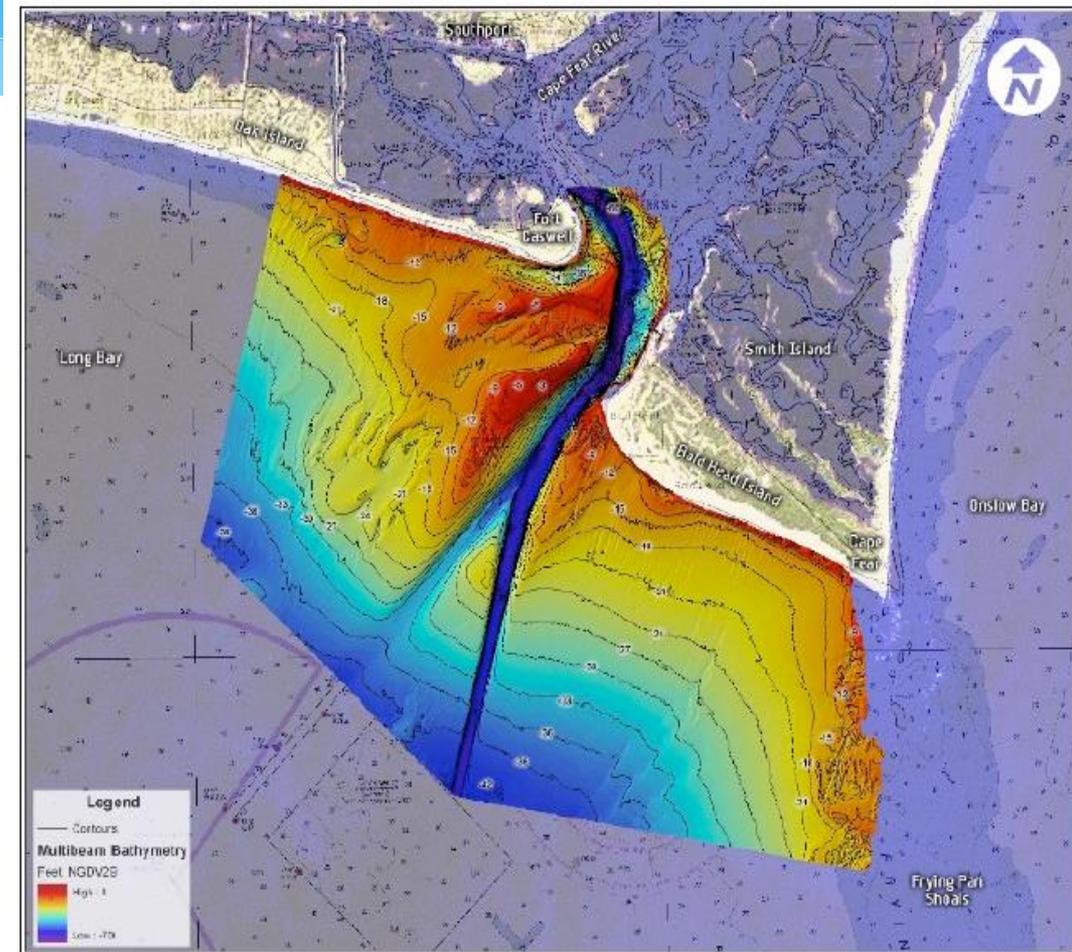
- \* Define Base Topography
- \* Evaluate Water Levels and Storm Surge
- \* Define Cross-shore Transects
- \* Identify the Primary Frontal Dune
- \* Evaluate Storm-induced Erosion
- \* Wave Hazard Modeling
- \* FIS and FIRM Production

# Define Base Topography



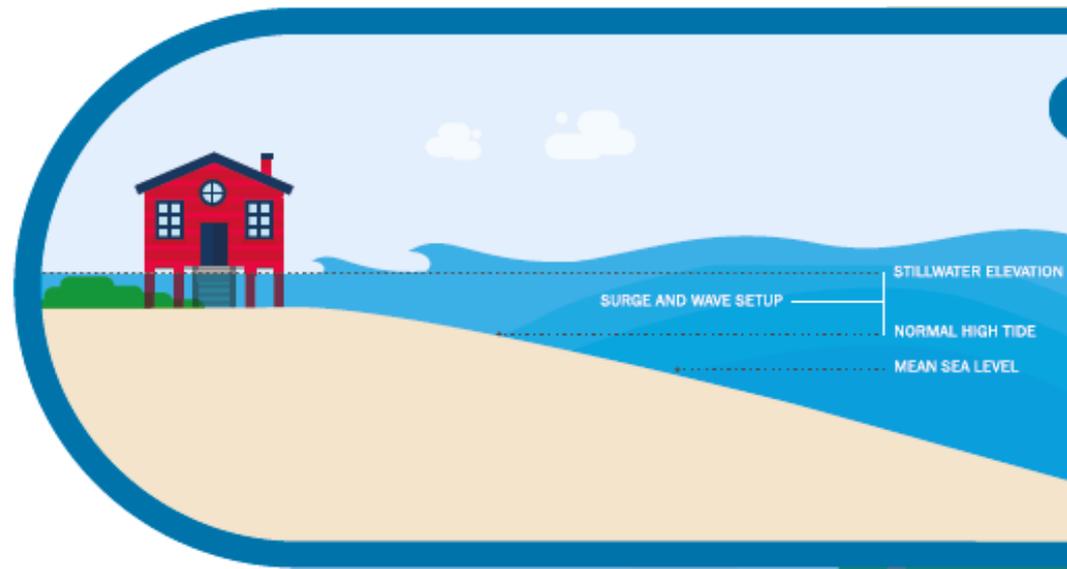
The best available Topographic and Bathymetric Data Sources were compiled from:

- NOAA
- USGS
- National Geophysical Data Center
- US Army Corps of Engineers
- Naval Postgraduate School
- UNC-Chapel Hill
- NC Flood Mapping Program



# Evaluate Water Levels and Storm Surge

- Using a suite of coastal models, we analyzed sea level, tides and storm surge.
- Calibrated and validate the coastal models using tide gage data and 6 historical storms.
- High Water Marks were used to validate model results to each storm
- Surge results were then applied to model shoreline wave impacts

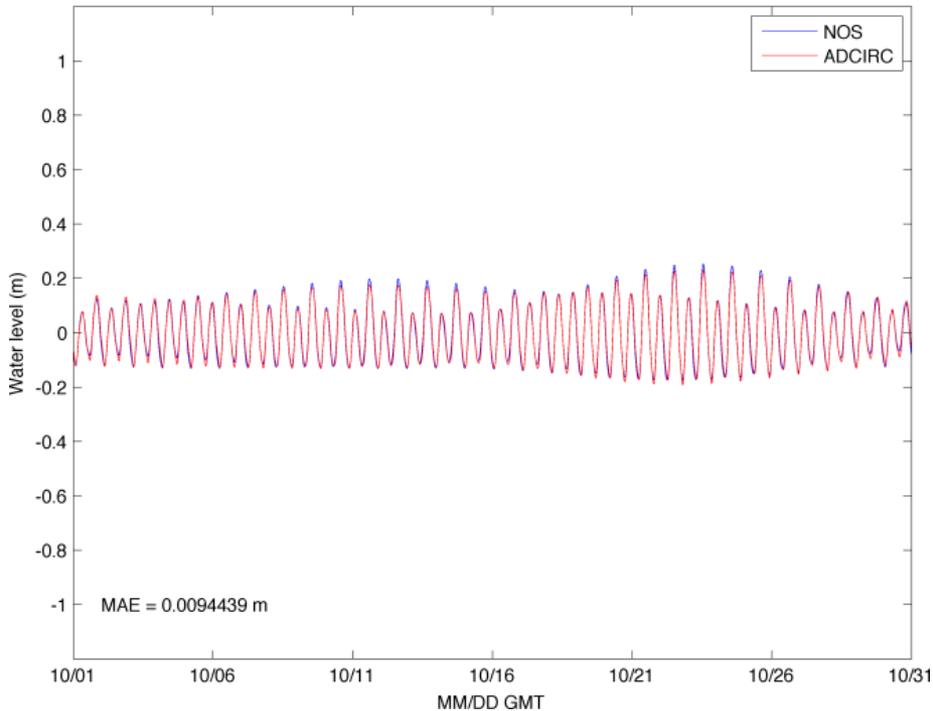


# Storm Surge Model - Tidal Validation

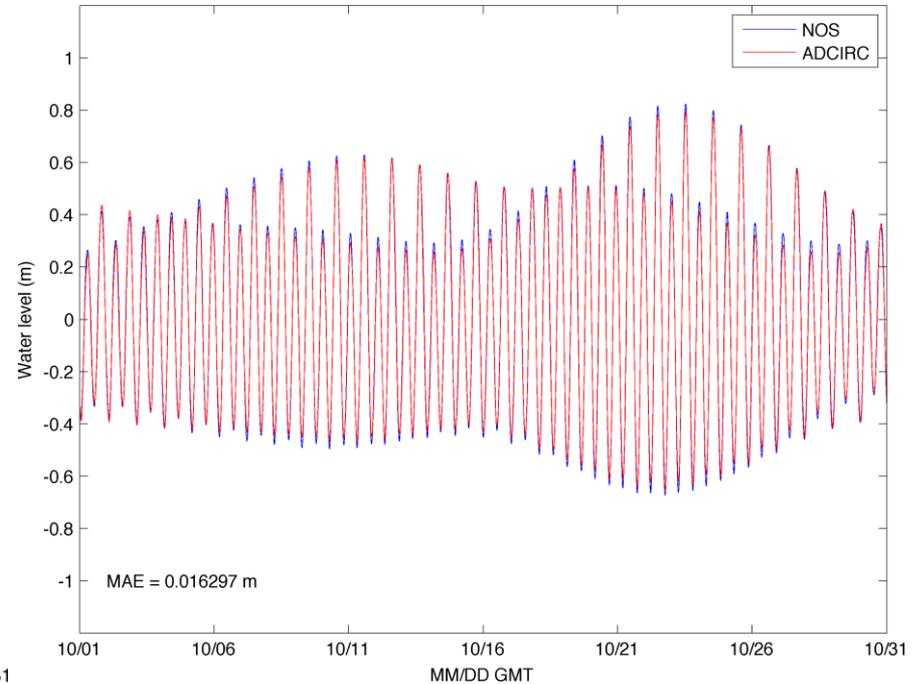
- \* ADCIRC model run 120 days with tides
- \* Simulated tide levels compared to NOAA gages

| Station      | RMSE, m | Adjusted RMSE, m | Adjustment, min |
|--------------|---------|------------------|-----------------|
| Duck Pier    | 2.0     | 1.9              | 2               |
| Oregon Inlet | 1.1     | 1.0              | 6               |
| Beaufort     | 1.9     | 1.4              | 4               |
| Wilmington   | 4.8     | 3.5              | 10              |
| Wrightsville | 1.6     | 1.6              | 0               |
| Southport    | 2.2     | 2.2              | 0               |
| Sunset Beach | 2.7     | 2.6              | -2              |

Oregon Inlet Marina, NC -- 8652587

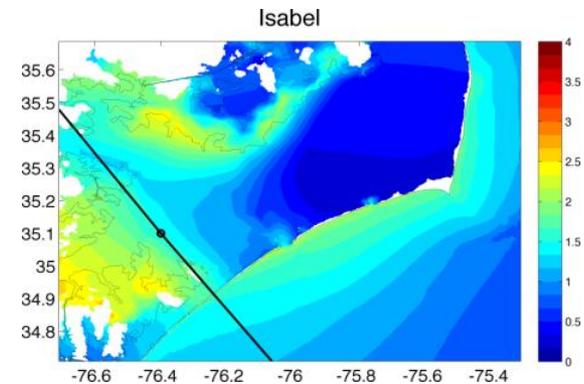
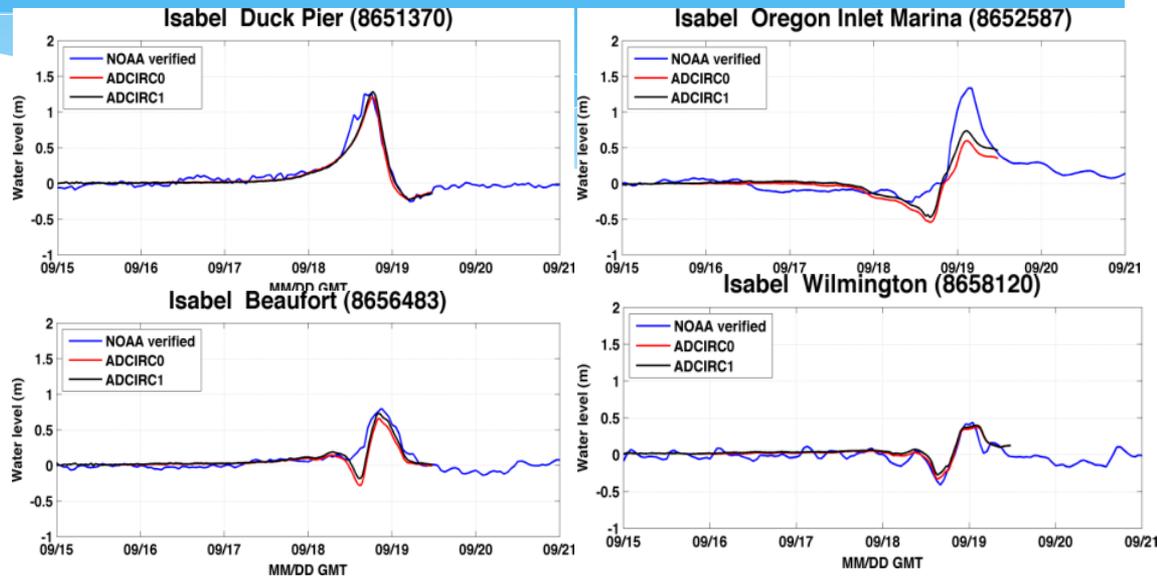


Duck Pier, NC -- 8651370



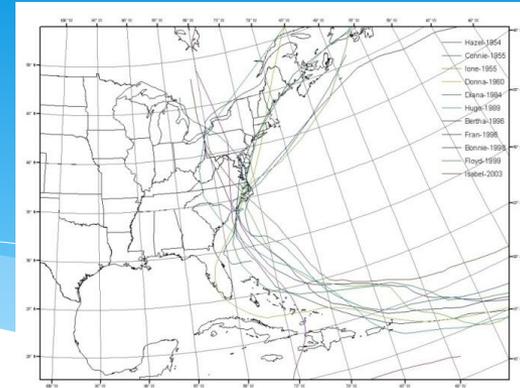
# Storm Surge Model Storm Validation Runs

- Results compared to coastal gages and historical high water marks

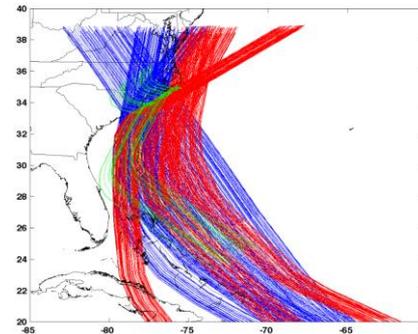


# Storm Surge Model Statistical Run Storms

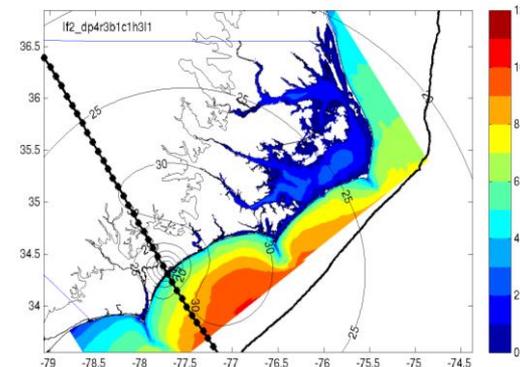
- 24 Historical **Tropical** Storms - After 1940 – Significant storms that impacted NC and SC used to determine typical tracks, wind speeds and pressures
  - Validation Storms: Emily ('93), Fran ('96), Isabel ('03), & Ophelia ('05)
- 675 tropical synthetic tracks were developed based on historical storms
- 22 **Extratropical** Historical Storms (Northeasters)
  - Validation Storms: 2006 Thanksgiving storm, and 2006 Decayed extratropical storm Ernesto



Representative Storms



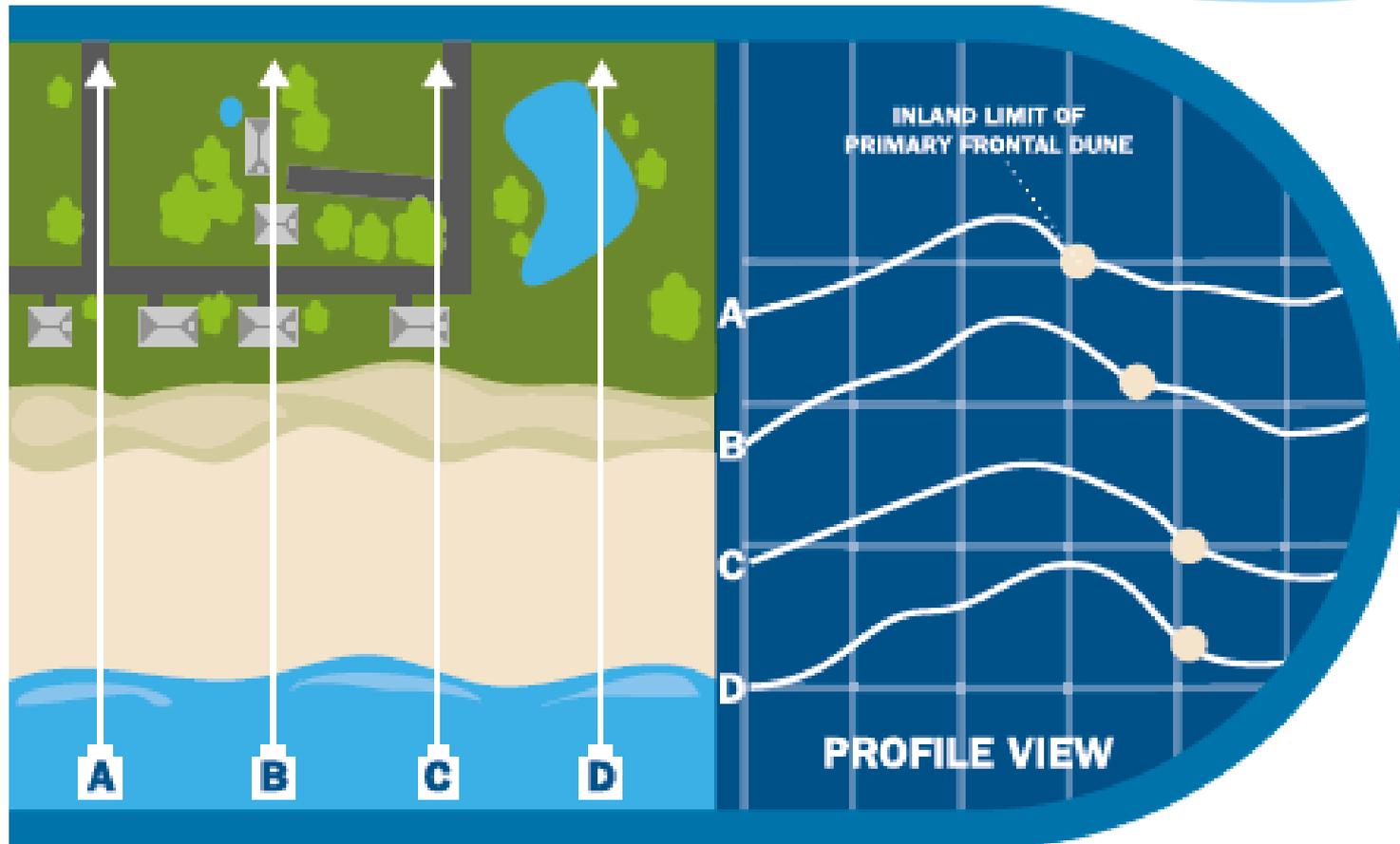
Tropical Storm Tracks



Statistical Run Water Levels

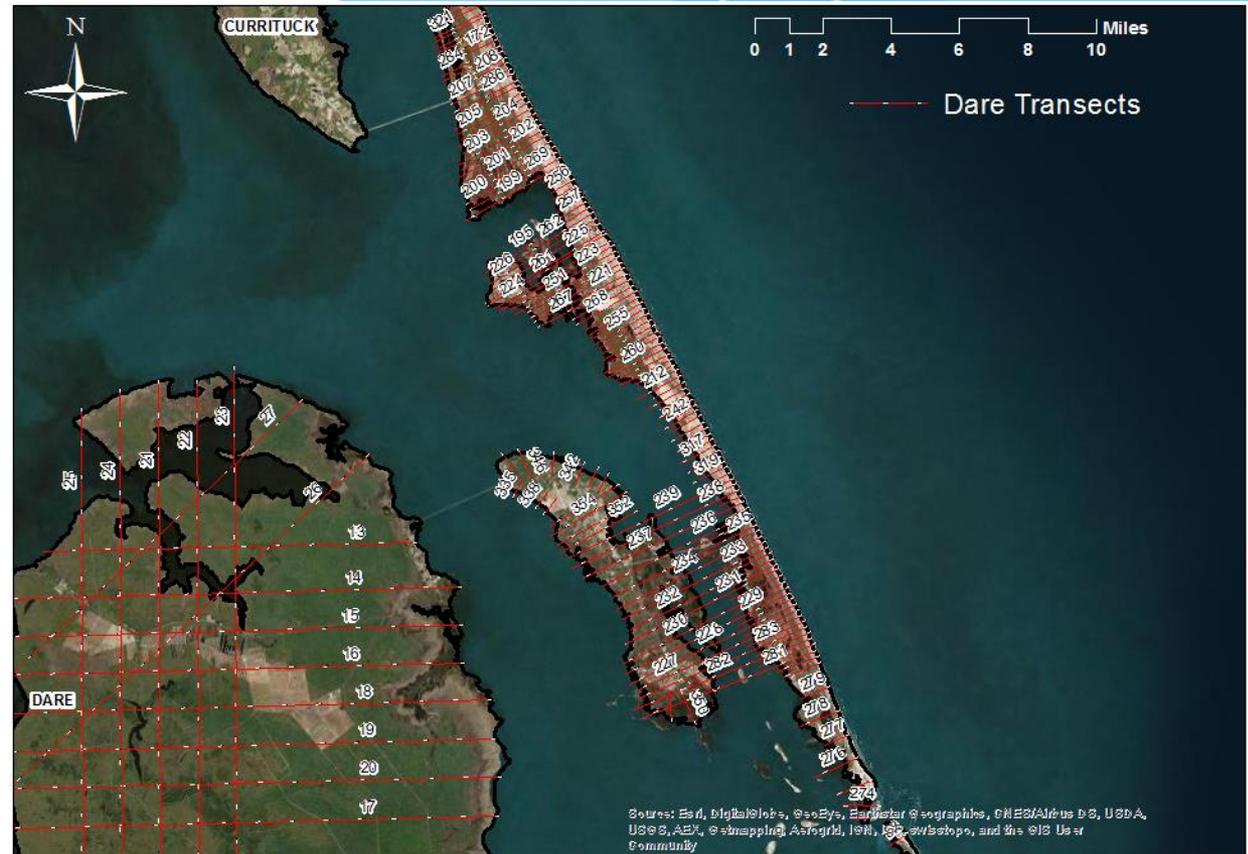
# Define Cross-Shore Transects

- Engineers and surveyors divided the shoreline (open coast and sound) into segments and represent each segment with a transect to model how topography, land use and development will influence waves



# Transect Layout

- Spaced every 500-2000 ft
- From Beach to Sound and Landward
- Previous model had spacing at roughly 2000ft



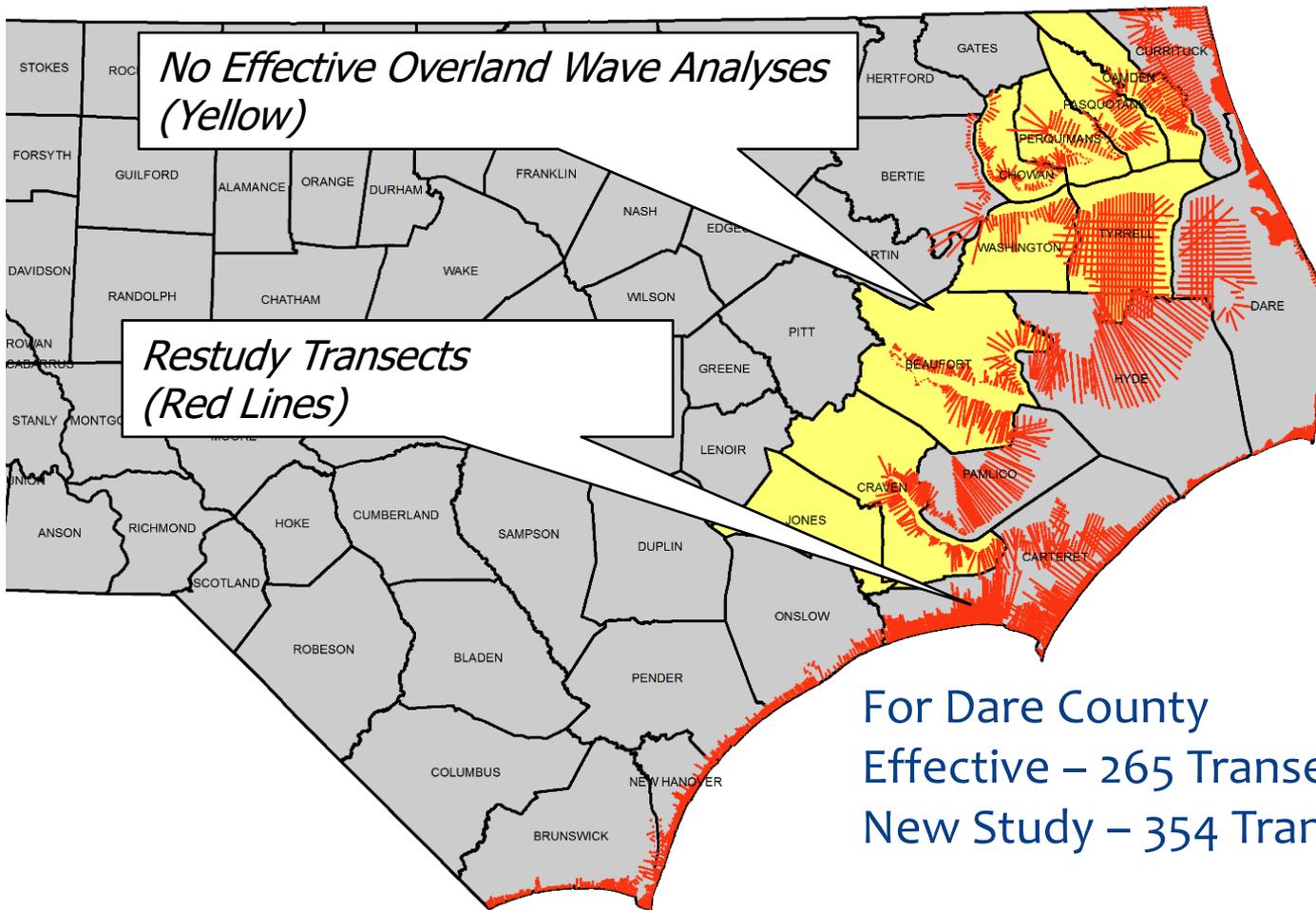
# Transect Layout



# Transects in Kill Devil Hills



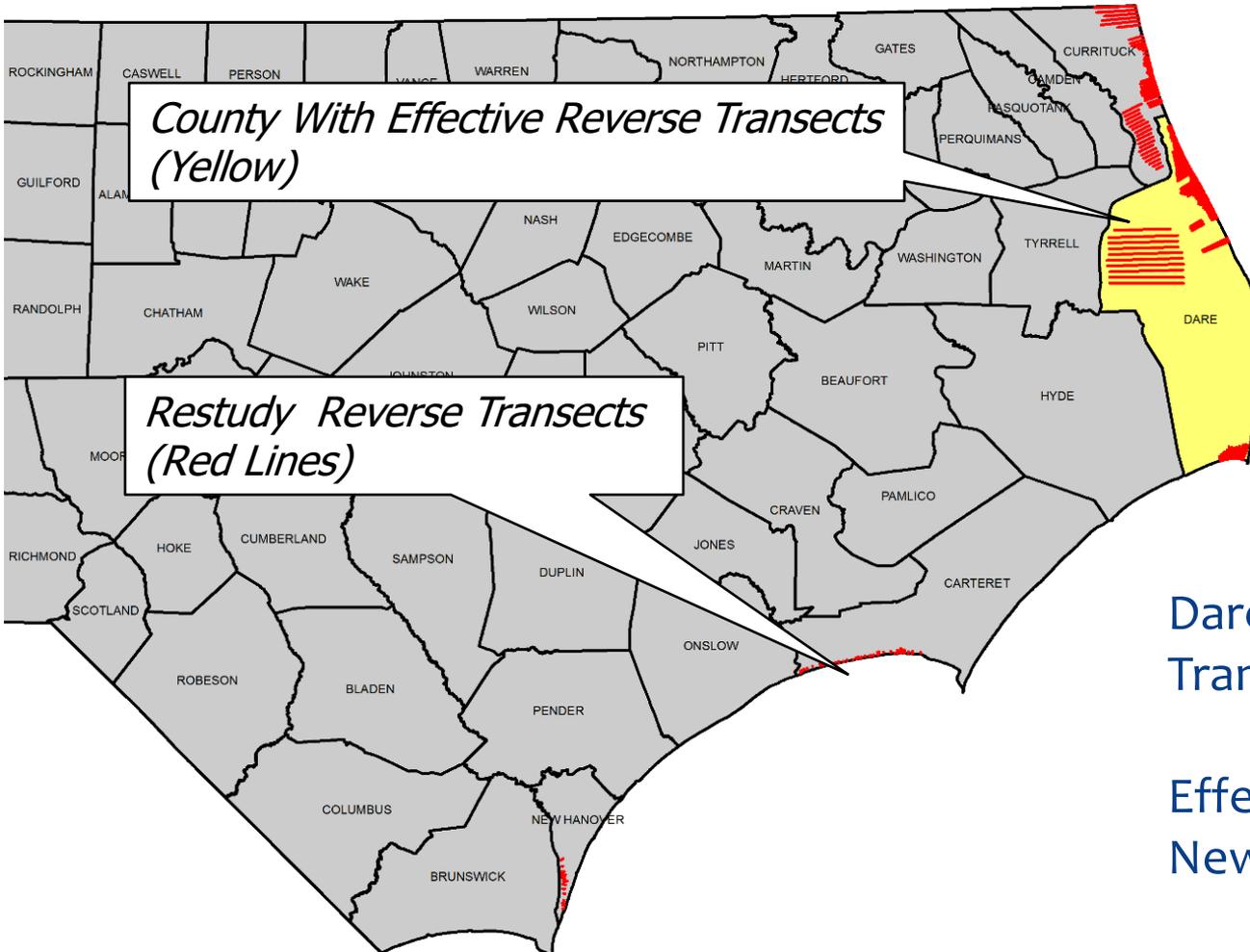
# Overland Wave Analyses



For Dare County  
Effective – 265 Transects  
New Study – 354 Transects

9 New Counties (New FEMA Sheltered  
Water Guidelines and Specifications)

# Reverse Transects

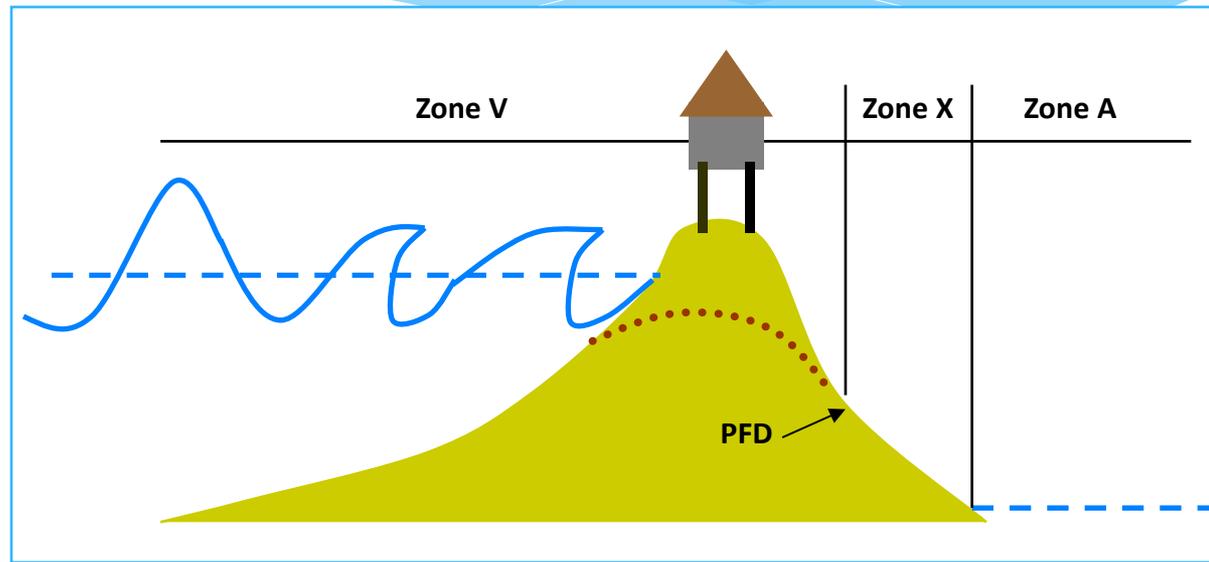


Dare County Reverse  
Transects

Effective - 69  
New Study - 86

# Identify the Primary Frontal Dune (PFD)

- Current FEMA mapping guidelines require dunes designated to be included in V Zone.
  - Reflects potential for erosion and wave impacts.
  - Preserves protection afforded by dunes and reduces flood hazards associated with man-made alterations of dunes.



# Identify the Primary Frontal Dune (PFD)

- Definition in NFIP regulations:
- \* “Continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms.”



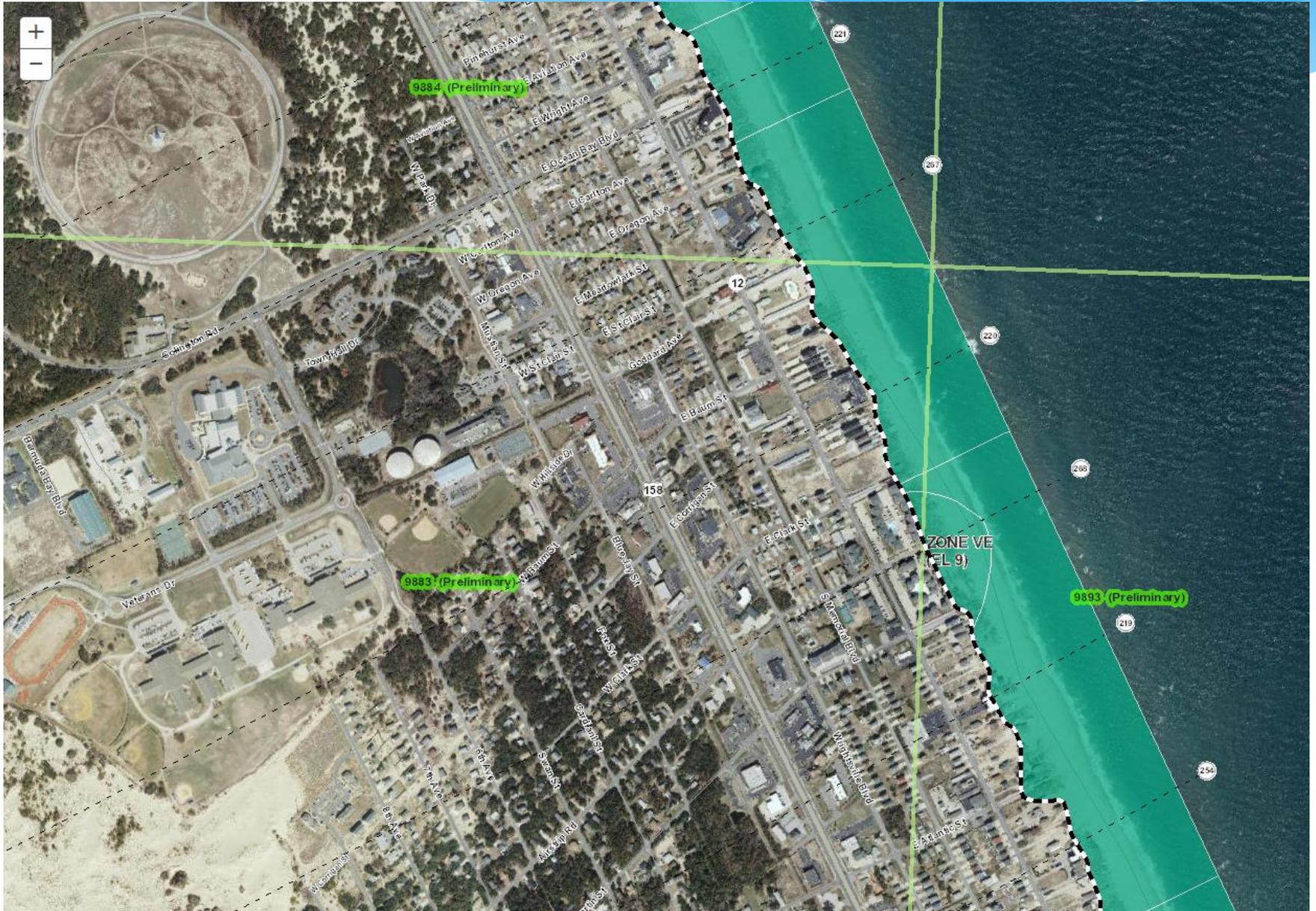
# PFD Examples



# PFD Examples

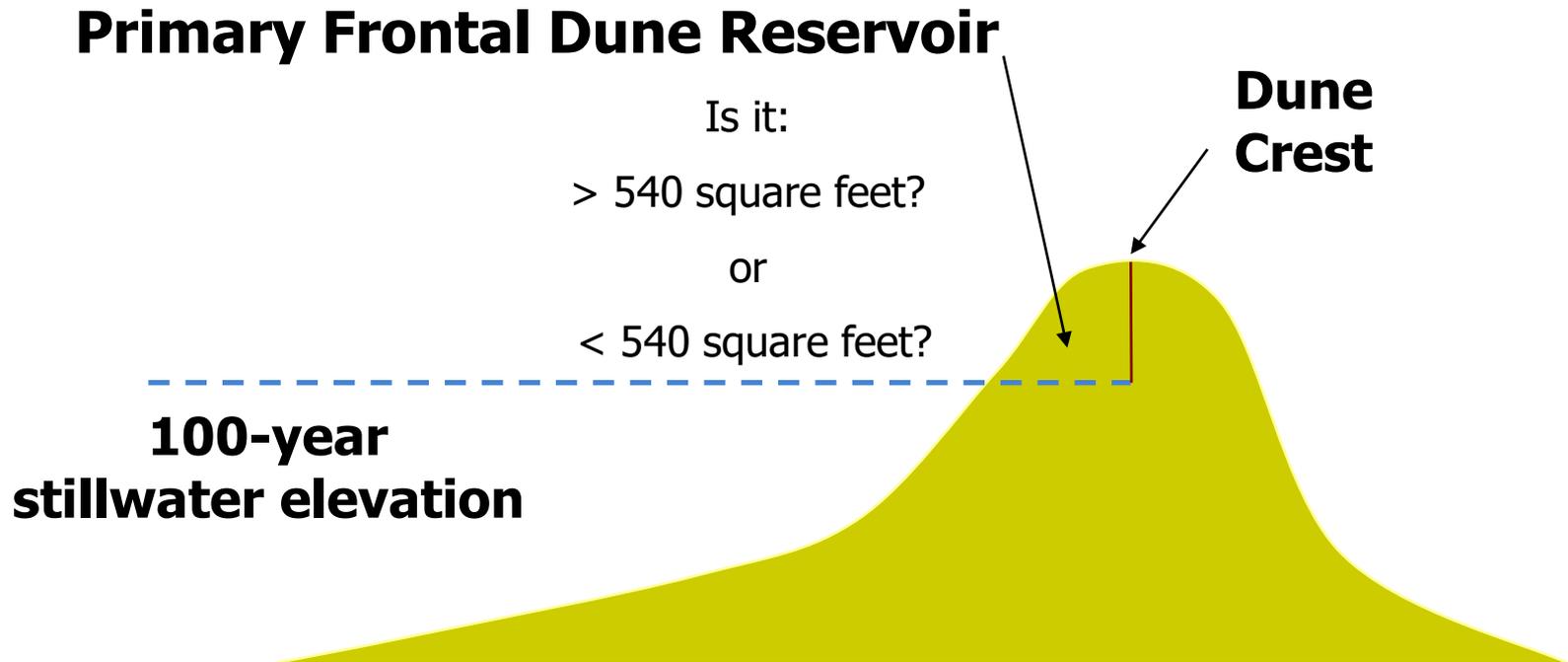


# PFD on FRIS



# Evaluate Storm-Induced Erosion

- Eroded overland wave transect generated based on 540 square foot rule (FEMA Guidelines and Specifications)
- Determines if a dune will be modeled as fully or partially removed during the regulatory flood event



# Modeled Dune Erosion

- If the reservoir is  $< 540$  sq. ft. the dune is modeled as removed
- If the reservoir is  $\geq 540$  sq. ft. the dune is modeled as eroded but crest and heel stays

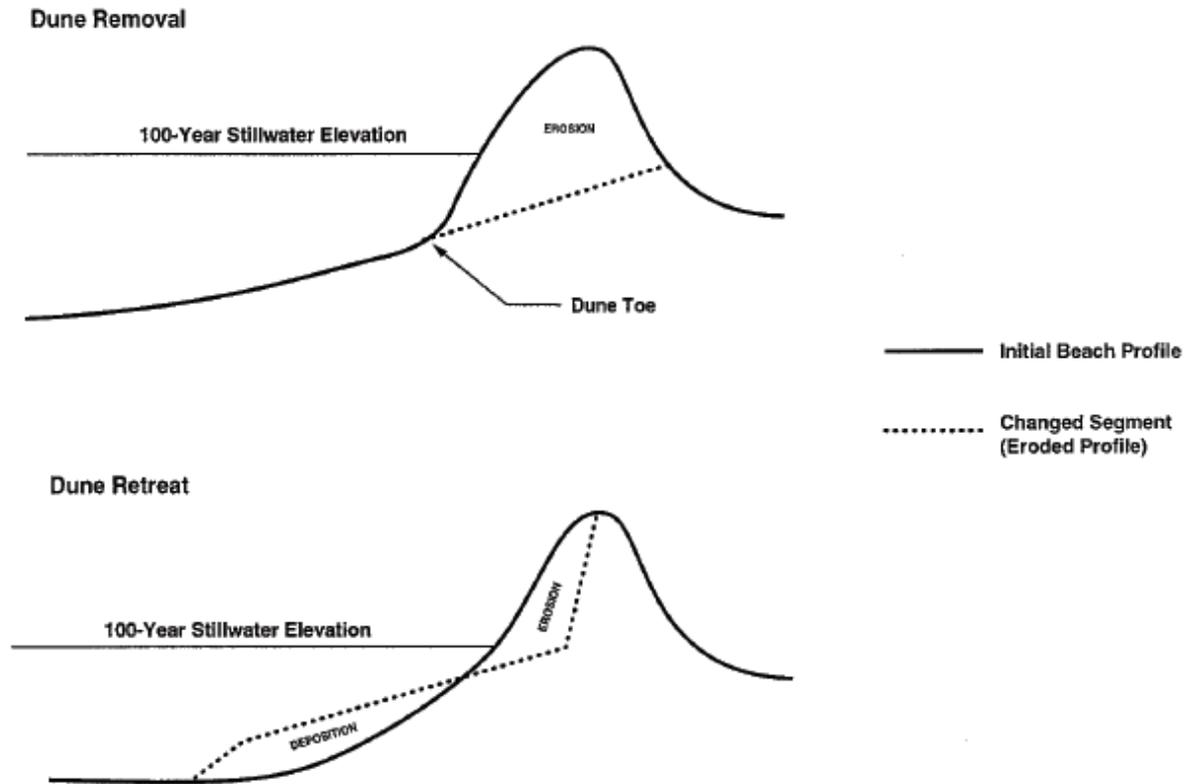
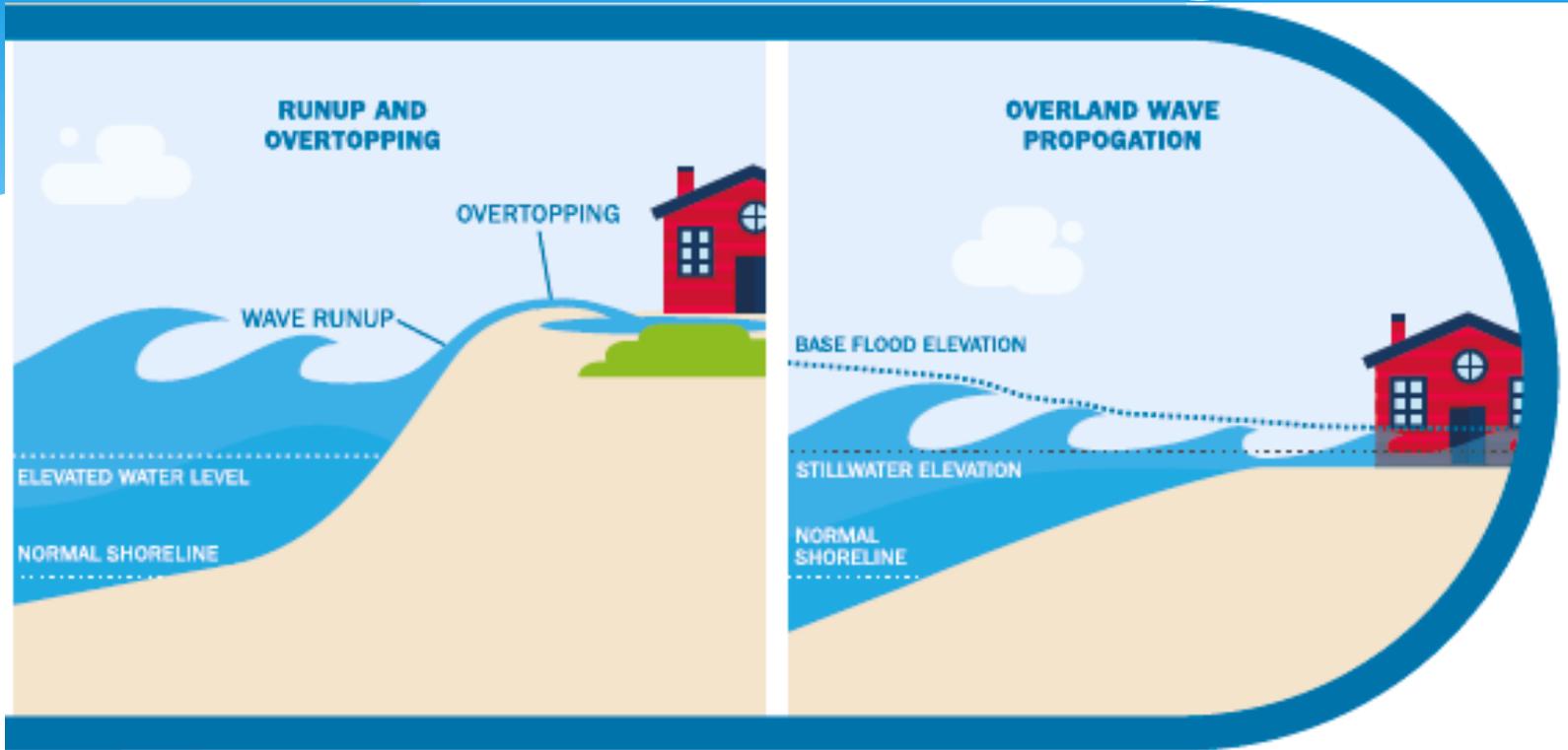


Figure D-5. Schematic Cases of Eroded Dune Geometries with Planar Slopes

# Wave Hazard Modeling



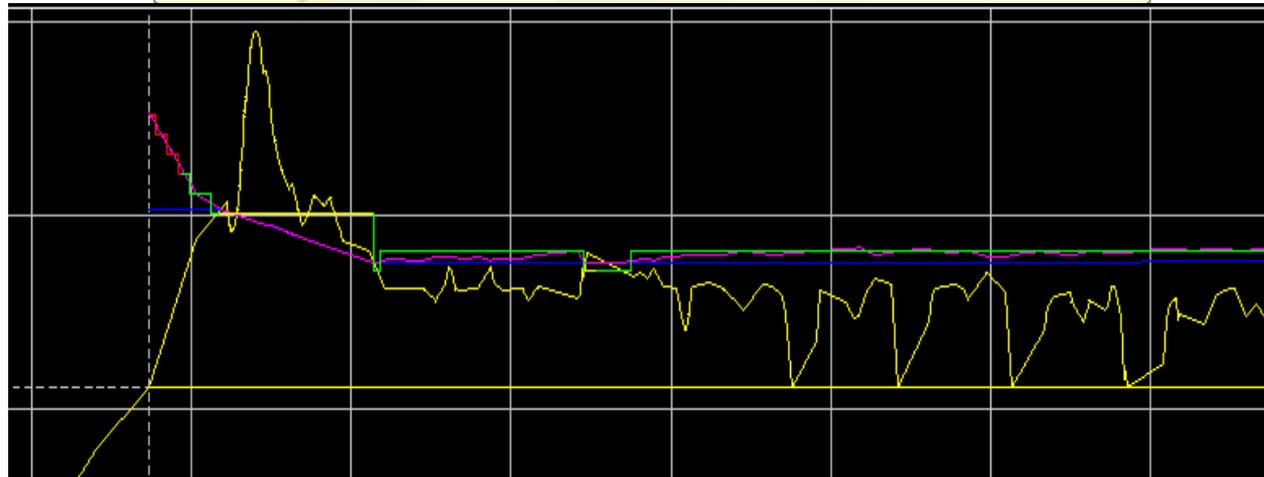
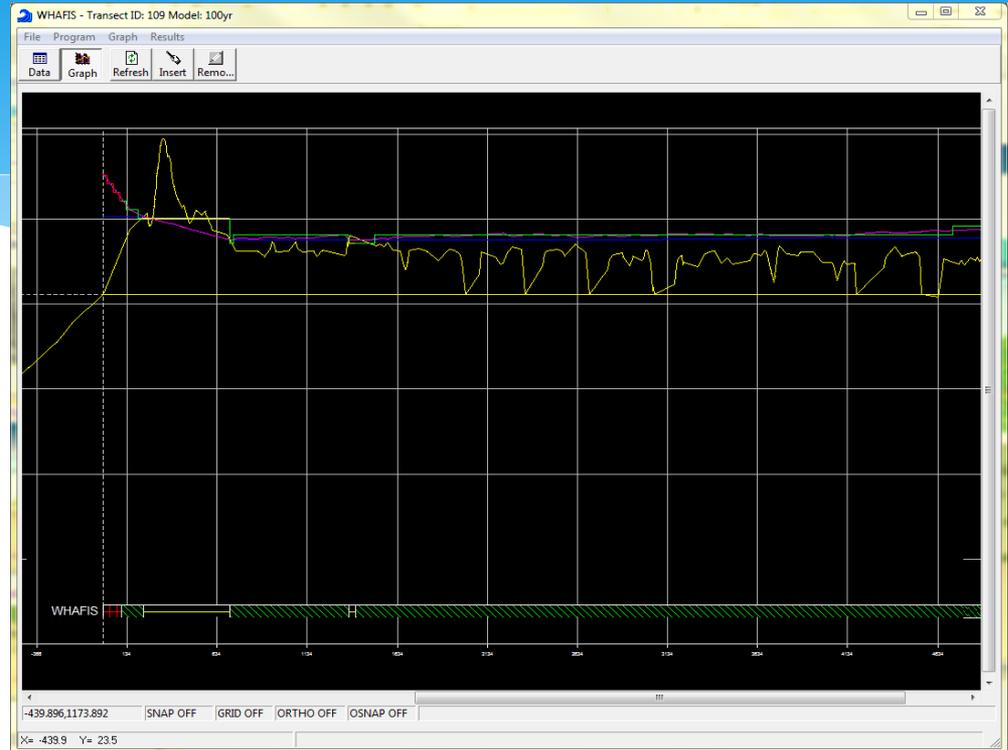
- During a flood, waves ride on the elevated water levels and can impact buildings and land that is normally dry.
- Wave hazard modeling evaluates the risks from overland wave propagation, runup and overtopping to determine BFEs.

# How are Wave Hazards Modeled?

## Overland Wave Model Measures

- Wave high
- Wave Regeneration

Models how topography and obstructions diminish wave energy that will effect wave height

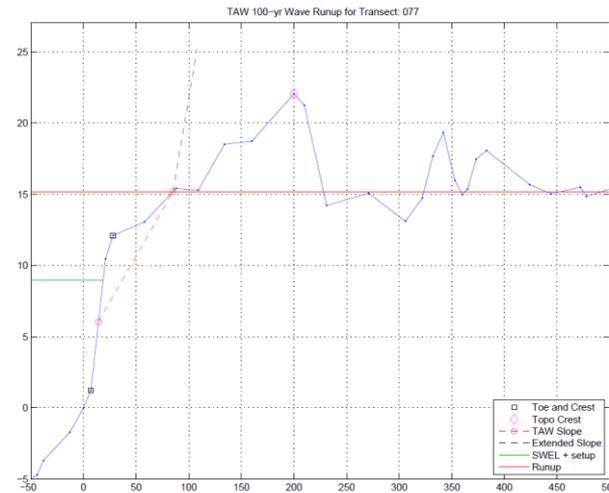
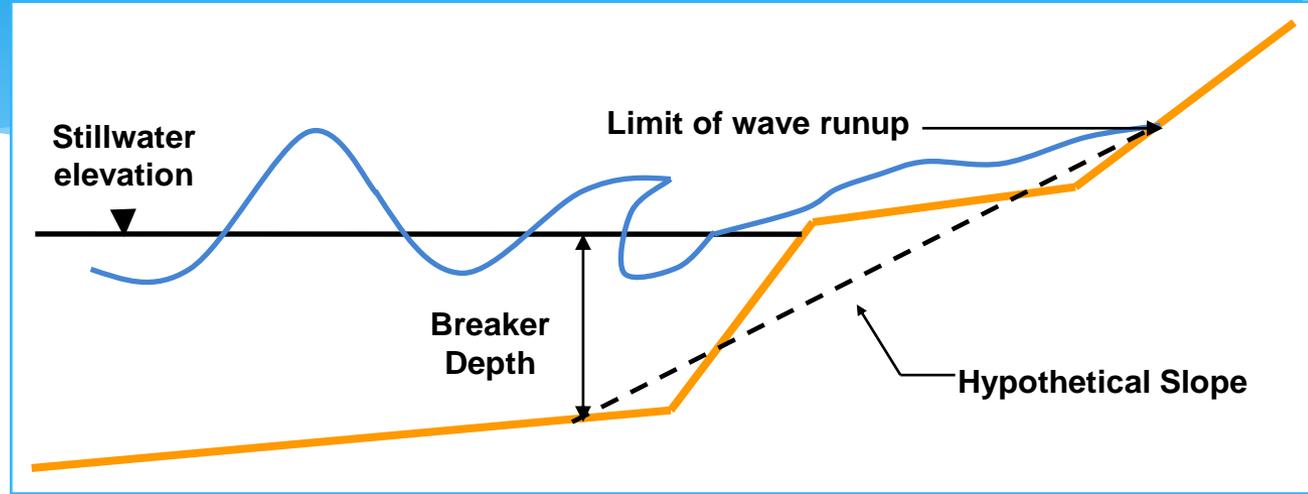


# Wave RUNUP

- \* Runup 2.0 – Beach and Dunes

- \* Vertical structures and steep topography

- \* Technical Advisory Committee for Water Retaining Structures (TAW)
- \* US Army Corps of Engineers Shore Protection Manual (SPM)



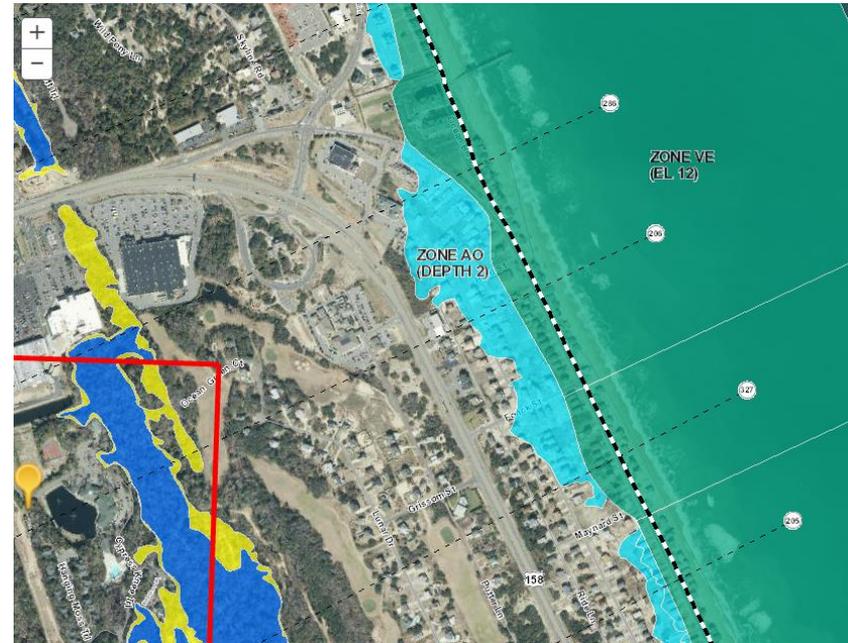
# Historical Flooding to Ground Truth Modeling and Mapping

- \* NCFMP looked closely at areas in Dare County that have documented cases of recent flooding.
- \* NCFMP conducted an extensive review of flooding due to Hurricane Sandy (October 29, 2012) and other recent historical flooding events.
- \* This review included:
  - \* Reviewed pictures and cases news articles;
  - \* Contact with the Dare County Planning Department to obtain local input of known flooded areas;
  - \* Review of the Dare County Hazard Mitigation Plan; data from the Western Carolina University, NC Coastal Inventory Project; LiDAR collected following Sandy
  - \* Post-Sandy NCFMP field assessments

# Historical Flooding used to Ground Truth Modeling and Mapping-Sandy



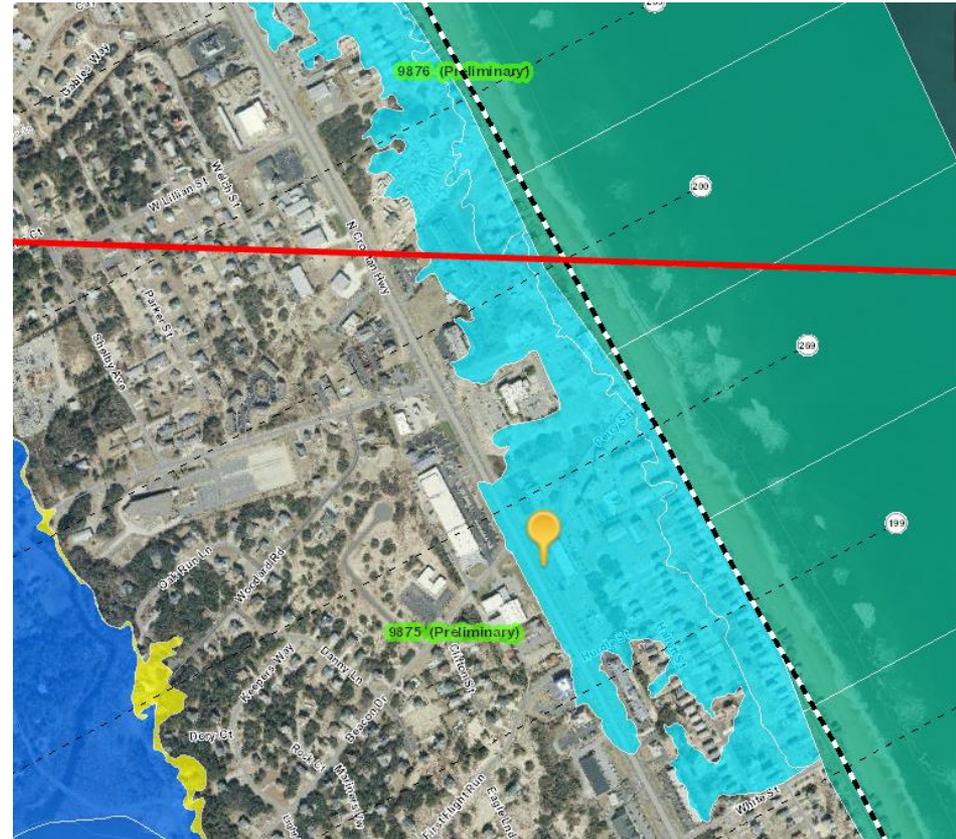
- \* South of Hilton Garden Inn near Southern Shores and US 158 and NC 12 split
- \* Mapped as AO (overtopping)



# Historical Flooding used to Ground Truth Modeling and Mapping-Sandy



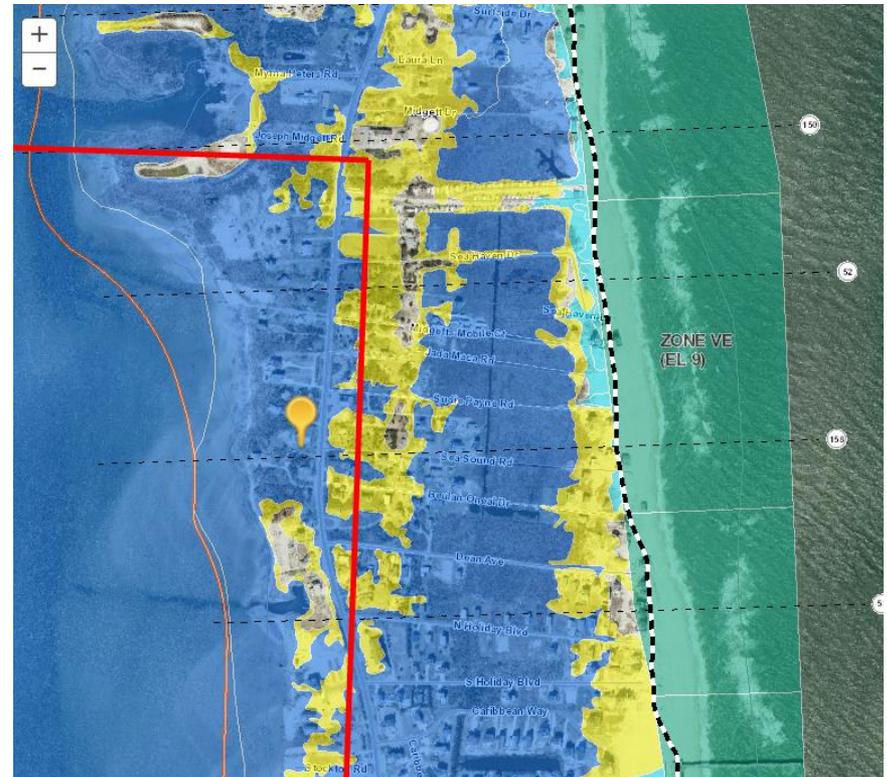
- \* Near Milepost 4 ½ on US 158. Overtopping of dunes and then ponding of water caused flooding along part of US 158 in Kitty Hawk.
- \* Mapped as AO (overtopping) near backside of dunes and then AH zone (ponding) in low laying areas



# Historical Flooding used to Ground Truth Modeling and Mapping-Sandy

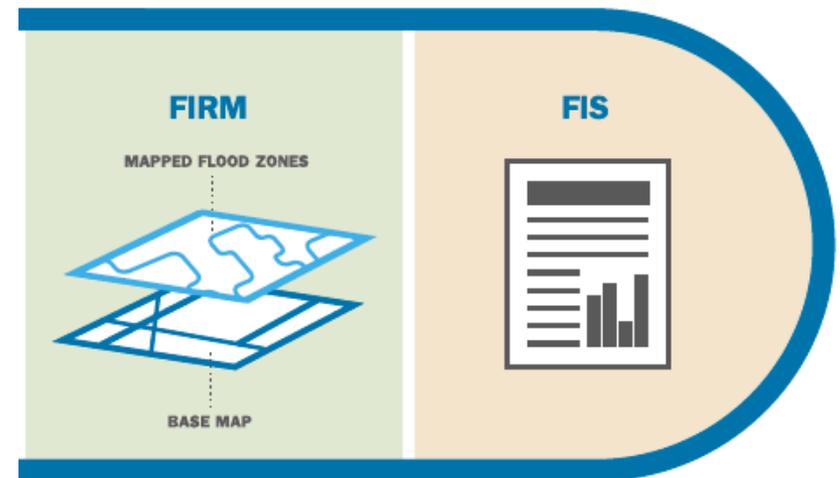


- \* Rodanthe, flooding from both open coast and sound
- \* Mapped as AE to represent flood waters flowing from the sound and overtopping from beach

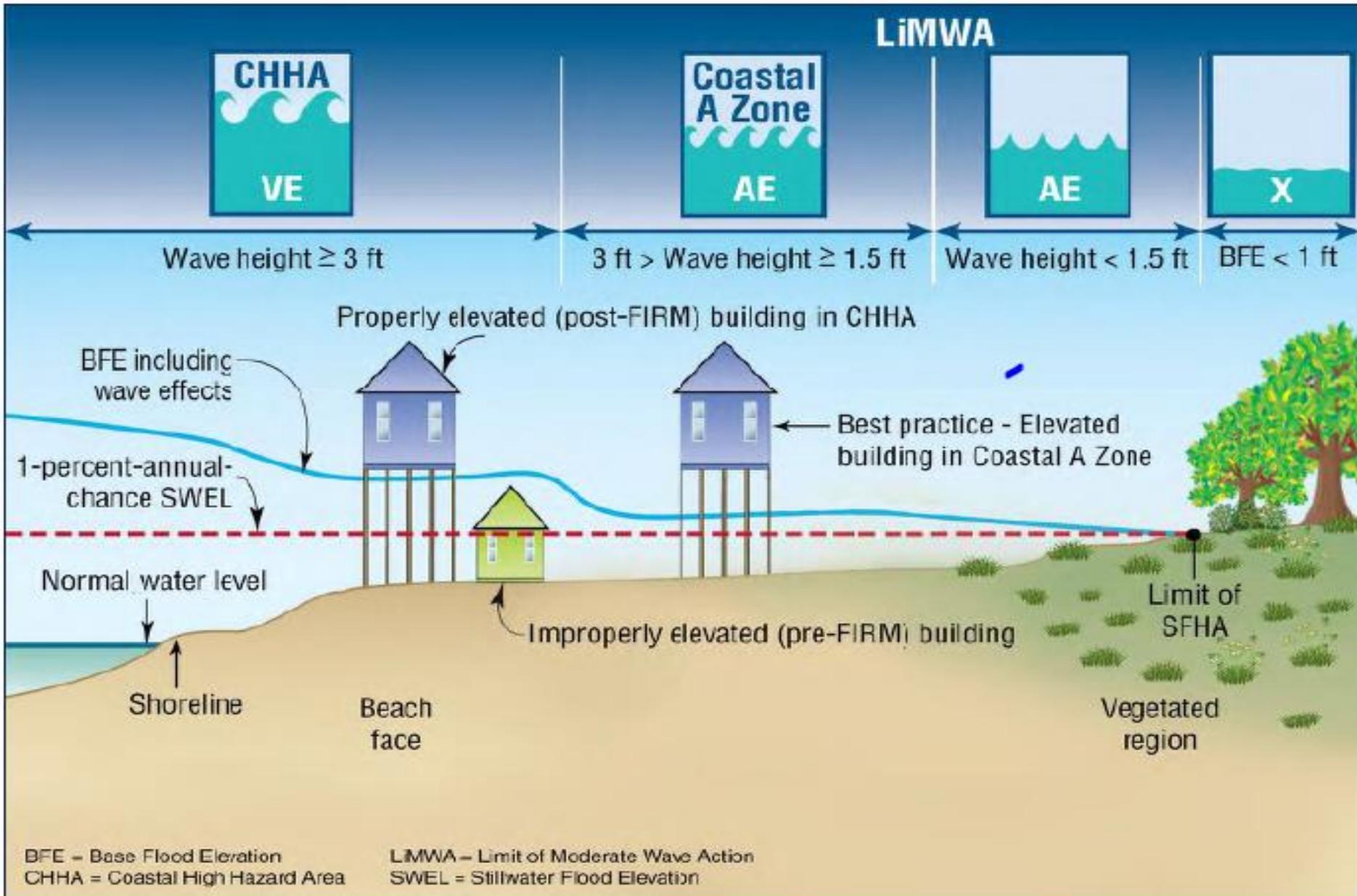


# FIS and FIRM Production

- \* Flood zones are mapped using both the coastal flood analysis and the riverine mapping data to create a seamless flood hazard map.
- \* The Flood Insurance Study (FIS) is prepared which summarizes the engineering methods and results.
- \* All data is available on the FRIS site.



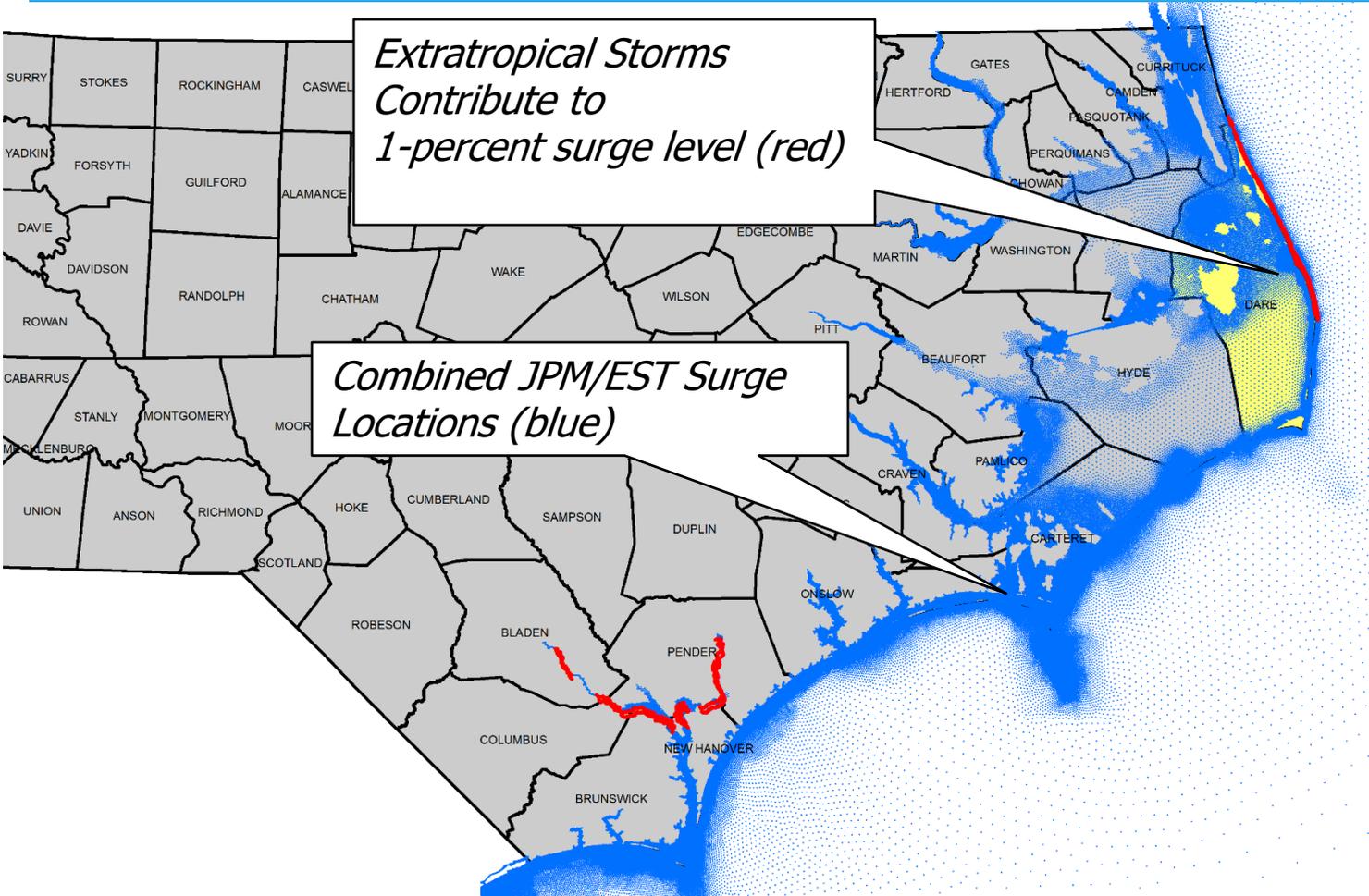
# Coastal Flood FIRM Mapping



# Extratropical Storms

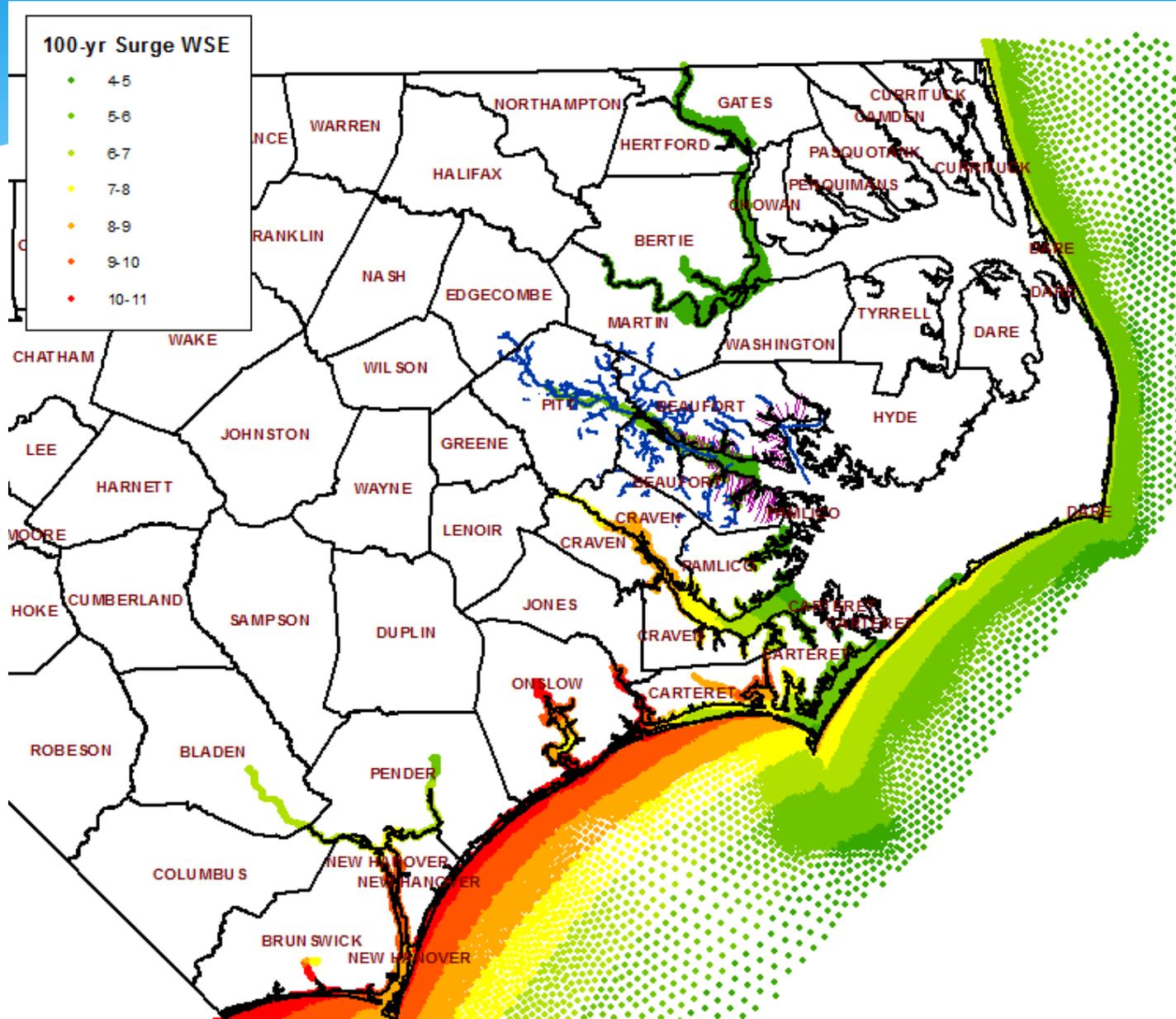
*Extratropical Storms  
Contribute to  
1-percent surge level (red)*

*Combined JPM/EST Surge  
Locations (blue)*

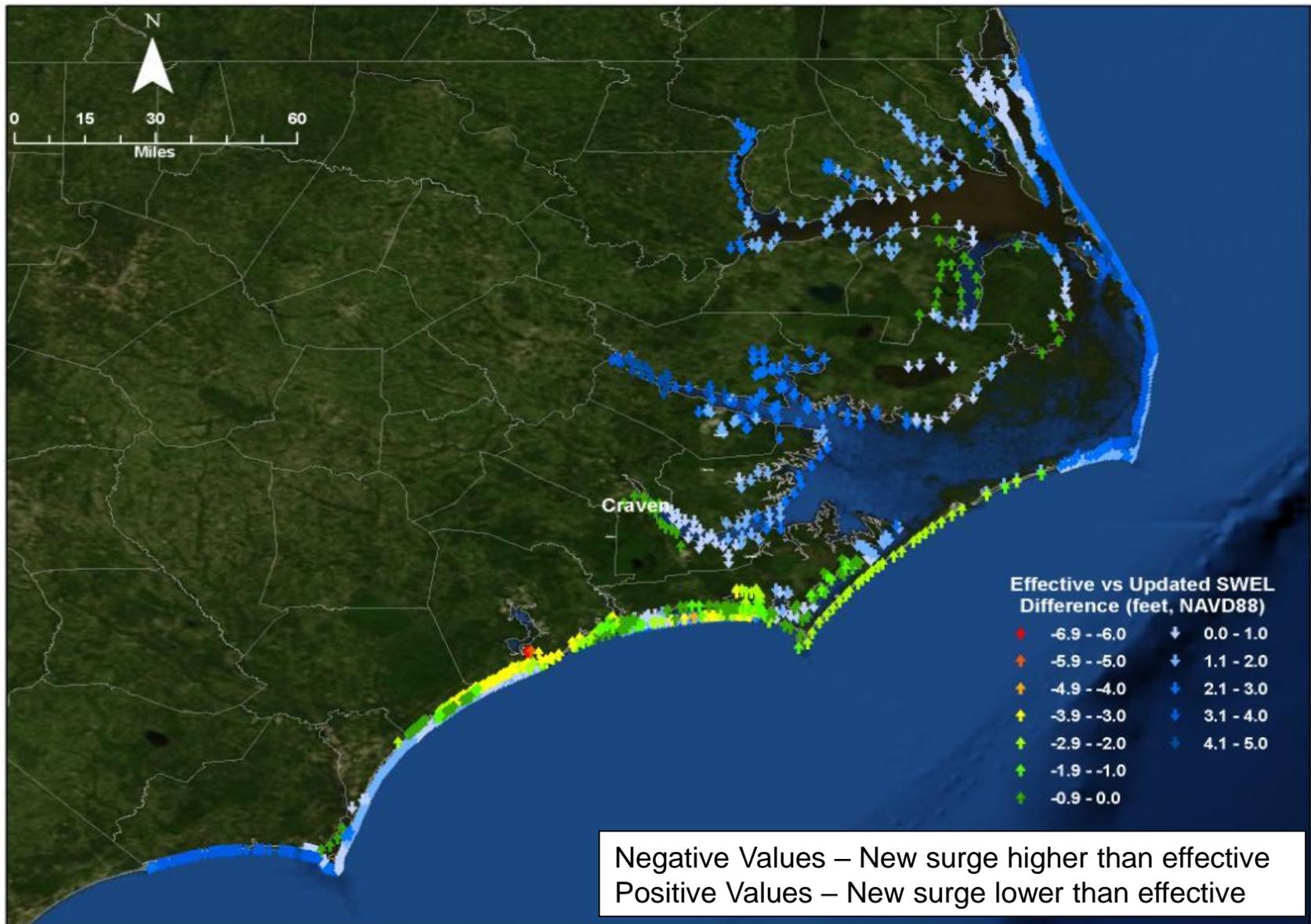


# DARE COUNTY REVISION RESULTS

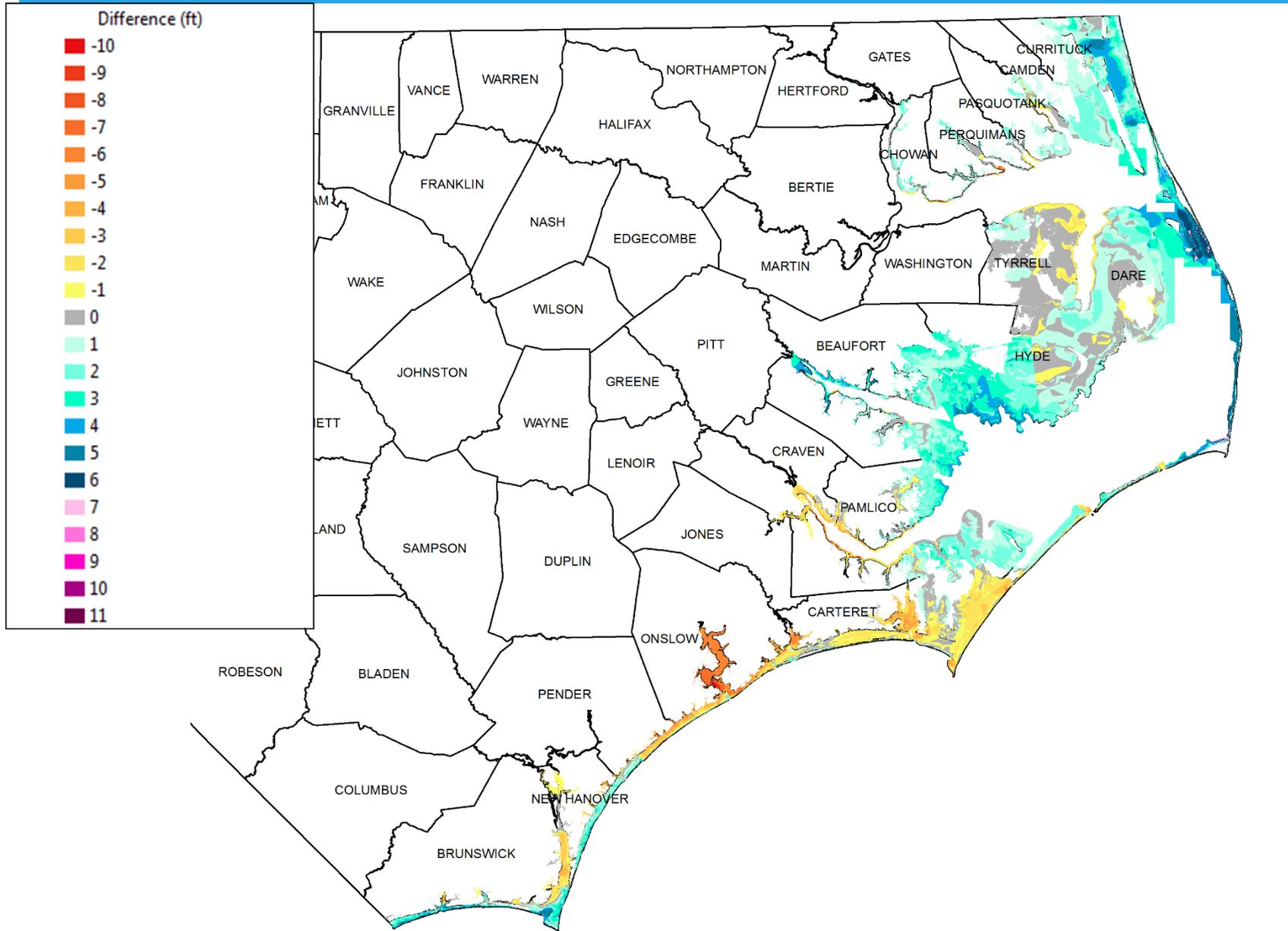
# Statewide Surge Values



# Statewide Surge Differences



# Statewide Base Flood Elevation (BFE) Changes



# Building and NFIP Policy Changes

| County      | Buildings |         |          |         |         |          | NFIP Policies |         |          |         |         |         |
|-------------|-----------|---------|----------|---------|---------|----------|---------------|---------|----------|---------|---------|---------|
|             | V Zone    |         |          | A Zone  |         |          | V Zone        |         |          | A Zone  |         |         |
|             | Current   | Updated | Changes  | Current | Updated | Changes  | Current       | Updated | Changes  | Current | Updated | Changes |
| Beaufort    | -         | 15      | 15       | 11,003  | 6,049   | (4,954)  | -             | -       | -        | 3,746   | 2,053   | (1,693) |
| Brunswick   | 6,468     | 1,438   | (5,030)  | 7,610   | 10,971  | 3,361    | 5,368         | 856     | (4,512)  | 5,094   | 8,079   | 2,985   |
| Camden      | -         | -       | -        | 2,418   | 1,430   | (988)    | -             | -       | -        | 731     | 389     | (342)   |
| Carteret    | 3,700     | 1,159   | (2,541)  | 14,050  | 16,287  | 2,237    | 1,261         | 387     | (874)    | 5,293   | 5,921   | 628     |
| Chowan      | -         | 1       | 1        | 828     | 460     | (368)    | -             | 1       | 1        | 178     | 91      | (87)    |
| Craven      | -         | 77      | 77       | 7,662   | 8,386   | 724      | -             | 21      | 21       | 2,115   | 2,159   | 44      |
| Currituck   | 1,097     | 126     | (971)    | 7,020   | 2,767   | (4,253)  | 587           | 23      | (564)    | 2,952   | 741     | (2,211) |
| Dare        | 5,001     | 1,731   | (3,270)  | 24,867  | 12,167  | (12,700) | 3,300         | 1,062   | (2,238)  | 14,202  | 6,172   | (8,030) |
| Hyde        | 27        | -       | (27)     | 6,636   | 5,432   | (1,204)  | 3             | -       | (3)      | 1,355   | 1,077   | (278)   |
| Jones       | -         | -       | -        | 352     | 381     | 29       | -             | -       | -        | 53      | 54      | 1       |
| New Hanover | 2,869     | 1,429   | (1,440)  | 7,600   | 9,724   | 2,124    | 2,108         | 913     | (1,195)  | 4,405   | 5,427   | 1,022   |
| Onslow      | 3,484     | 2,039   | (1,445)  | 3,707   | 7,217   | 3,510    | 1,071         | 536     | (535)    | 871     | 1,617   | 746     |
| Pamlico     | 16        | 30      | 14       | 4,955   | 3,811   | (1,144)  | 8             | 7       | (1)      | 1,667   | 1,129   | (538)   |
| Pasquotank  | -         | -       | -        | 6,754   | 3,816   | (2,938)  | -             | -       | -        | 2,025   | 985     | (1,040) |
| Pender      | 1,953     | 1,686   | (267)    | 4,953   | 5,870   | 917      | 1,099         | 820     | (279)    | 1,923   | 2,358   | 435     |
| Perquimans  | -         | 2       | 2        | 1,610   | 706     | (904)    | -             | -       | -        | 299     | 100     | (199)   |
| Tyrrell     | -         | -       | -        | 2,722   | 2,268   | (454)    | -             | -       | -        | 563     | 439     | (124)   |
| Totals      | 24,615    | 9,733   | (14,882) | 114,747 | 97,742  | (17,005) | 14,805        | 4,626   | (10,179) | 47,472  | 38,791  | (8,681) |

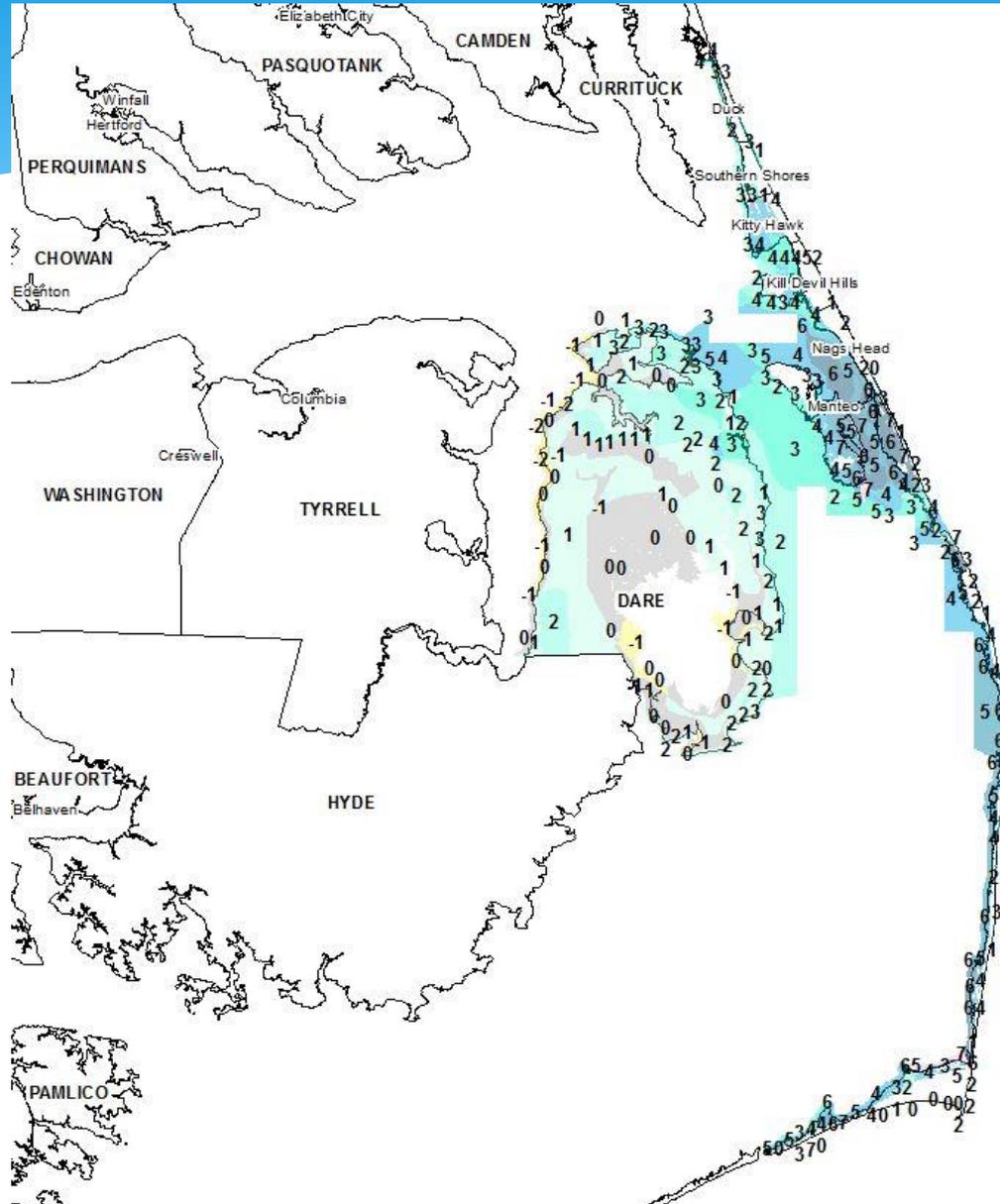
( ) - Indicates net reduction in building or policies in V or A Zone.

# Changes In Dare Co: Buildings in SFHA

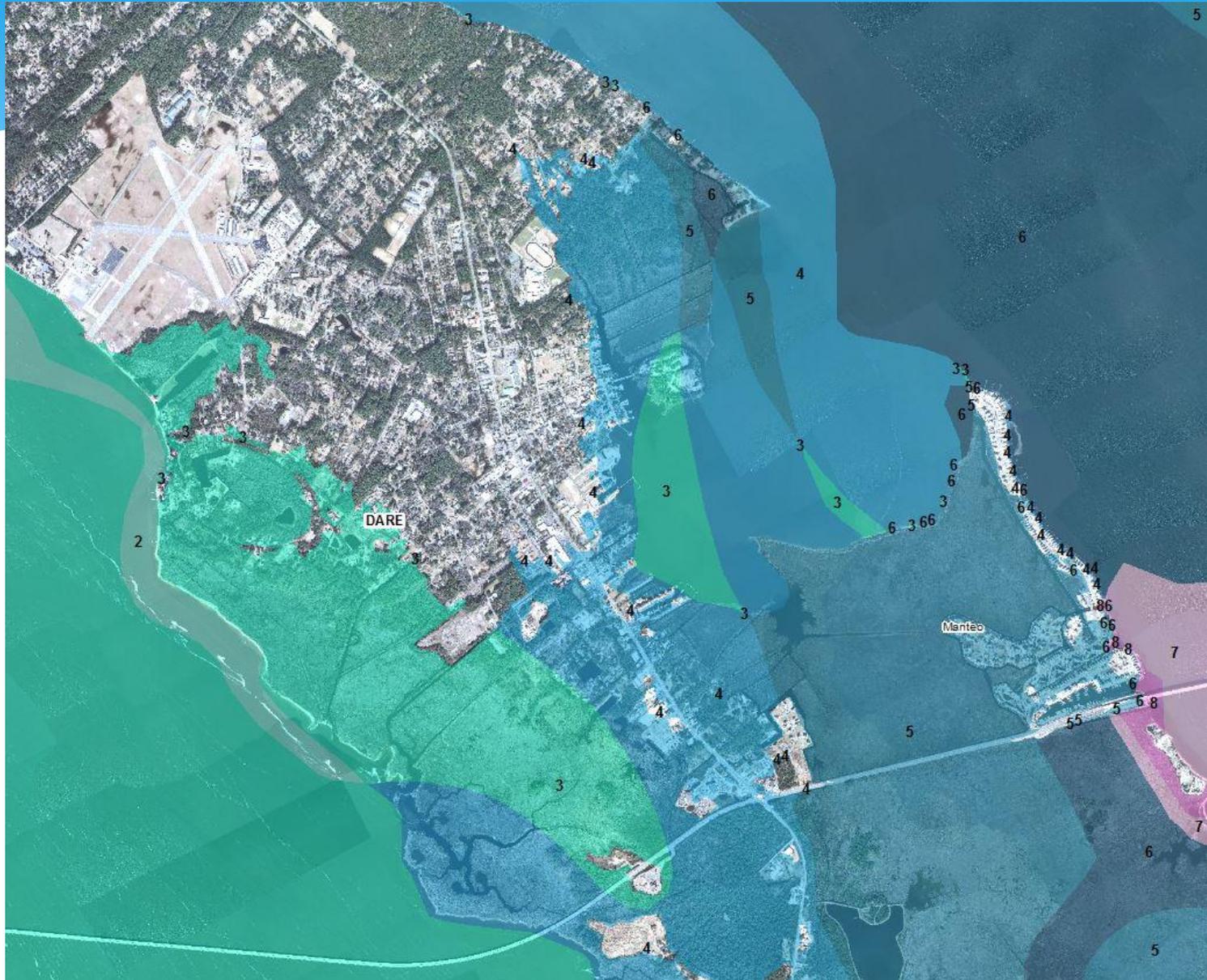
|                         | Buildings    |            |               |              |
|-------------------------|--------------|------------|---------------|--------------|
|                         | V Zone       |            | A Zone        |              |
|                         | Current      | Updated    | Current       | Updated      |
| <b>DARE COUNTY</b>      | <b>1,828</b> | <b>124</b> | <b>12,875</b> | <b>8,493</b> |
| <b>DUCK</b>             | <b>397</b>   | <b>255</b> | <b>882</b>    | <b>96</b>    |
| <b>KILL DEVIL HILLS</b> | <b>511</b>   | <b>226</b> | <b>4,369</b>  | <b>182</b>   |
| <b>KITTY HAWK</b>       | <b>500</b>   | <b>278</b> | <b>1,898</b>  | <b>979</b>   |
| <b>MANTEO</b>           | <b>13</b>    | <b>0</b>   | <b>1,149</b>  | <b>418</b>   |
| <b>NAGS HEAD</b>        | <b>1,405</b> | <b>726</b> | <b>2,756</b>  | <b>481</b>   |
| <b>SOUTHERN SHORES</b>  | <b>250</b>   | <b>122</b> | <b>1,035</b>  | <b>237</b>   |

Kitty Hawk has 389 structures in Zone AH and there will be 893 structures in Zone AO (County-wide).

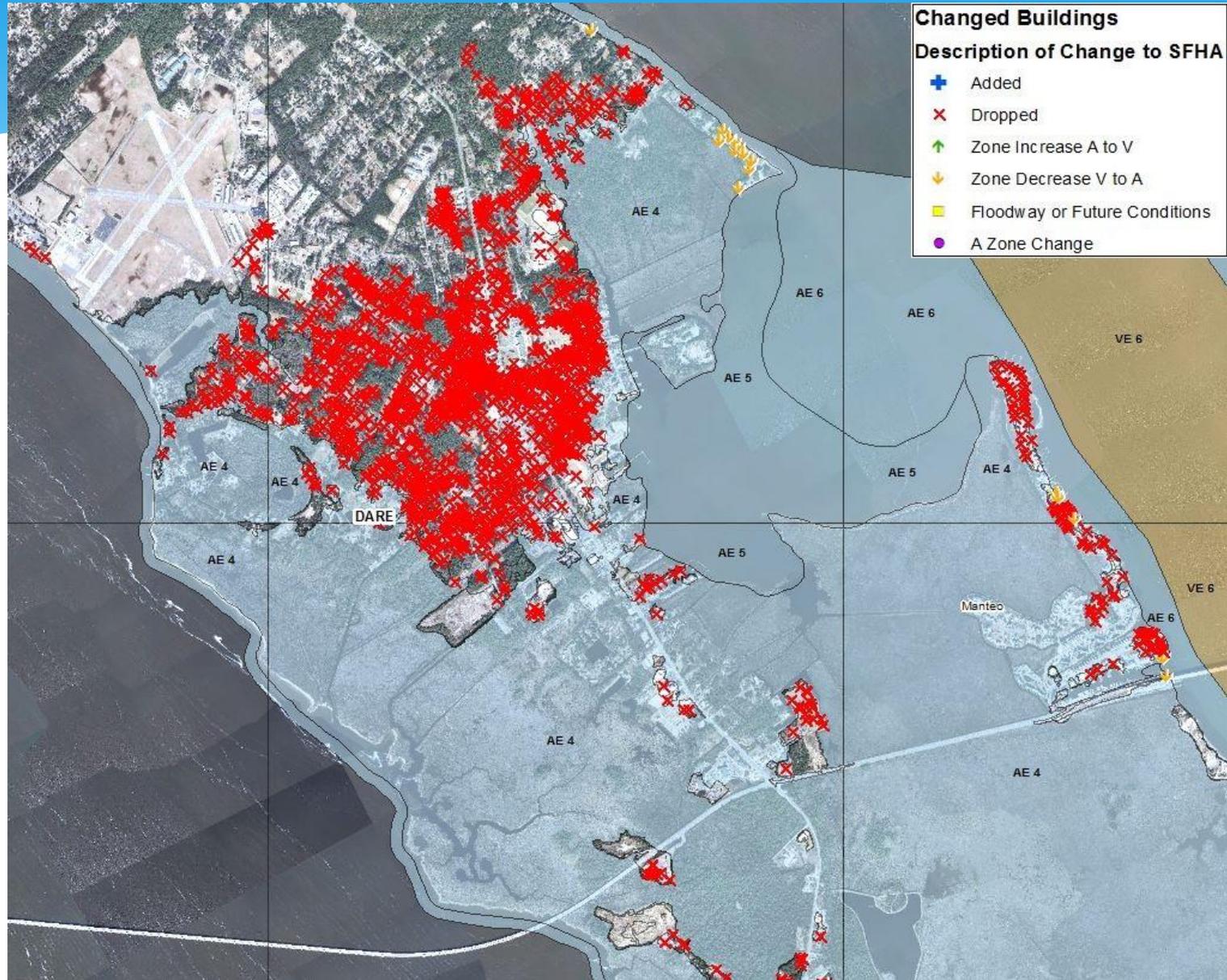
# Dare County Changes: BFEs



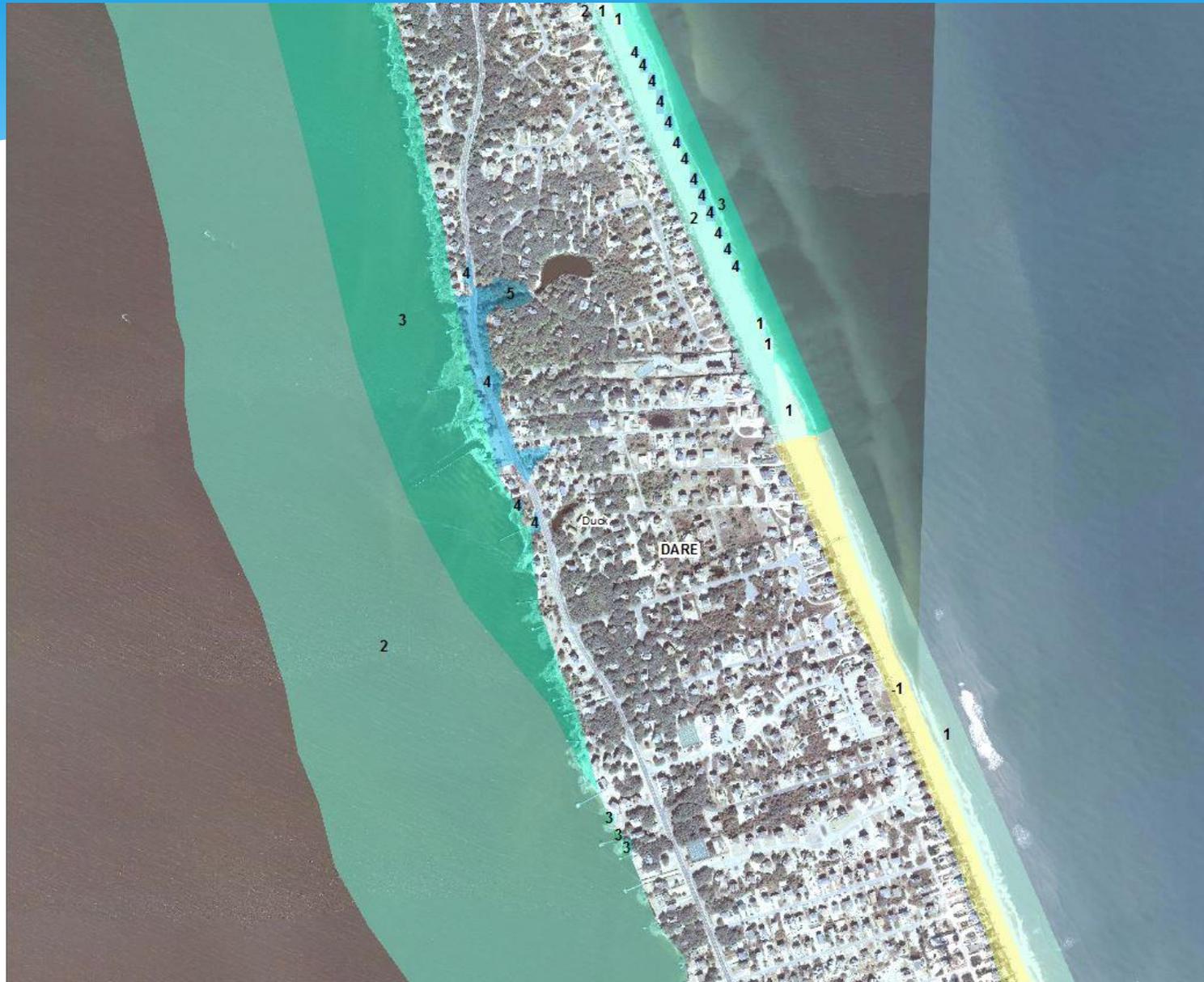
# Changes near Manteo: BFE Decrease



# Changes near Manteo: BFE Decrease



# Changes near Duck: BFE Decrease

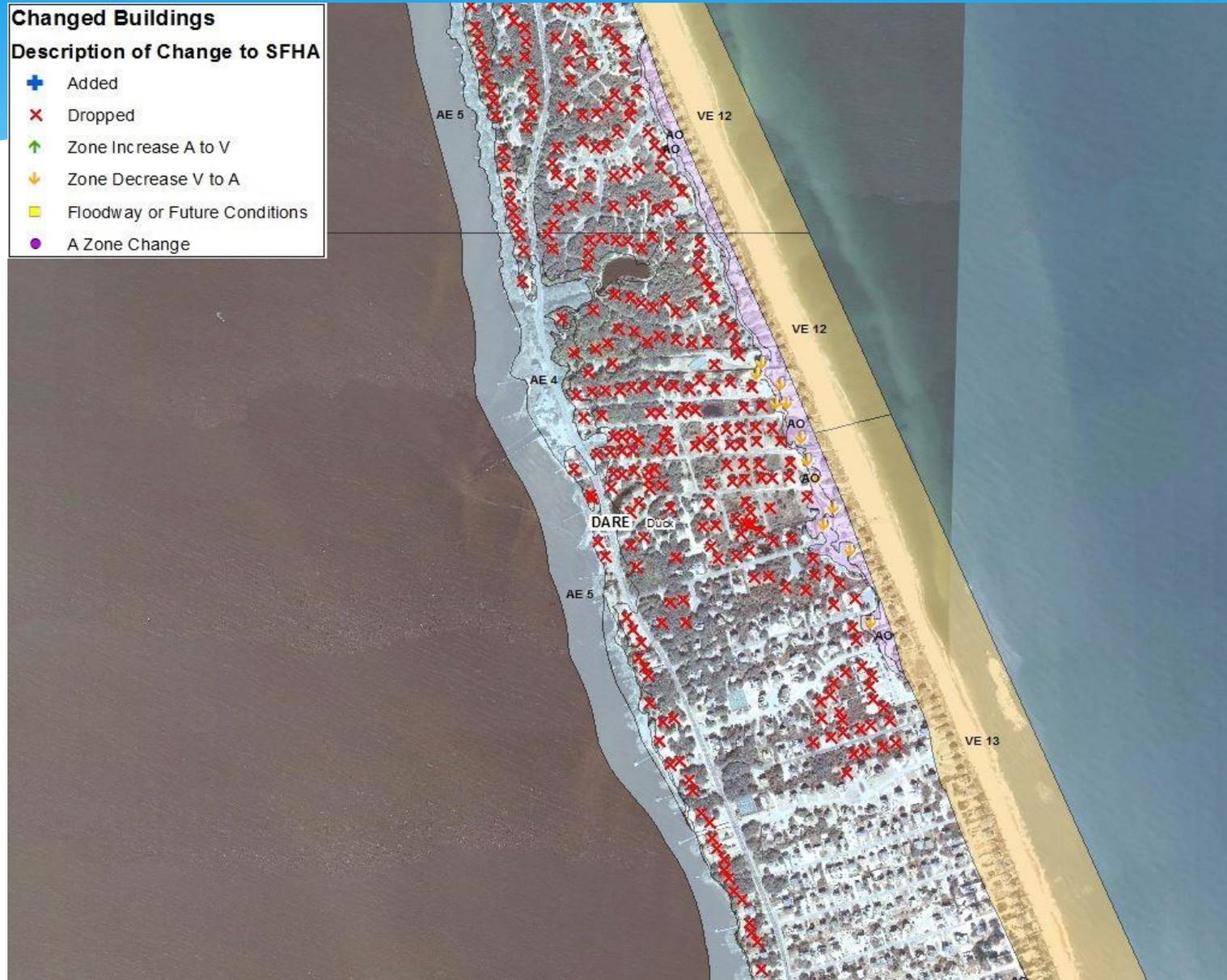


# Changes near Duck: BFE Decrease

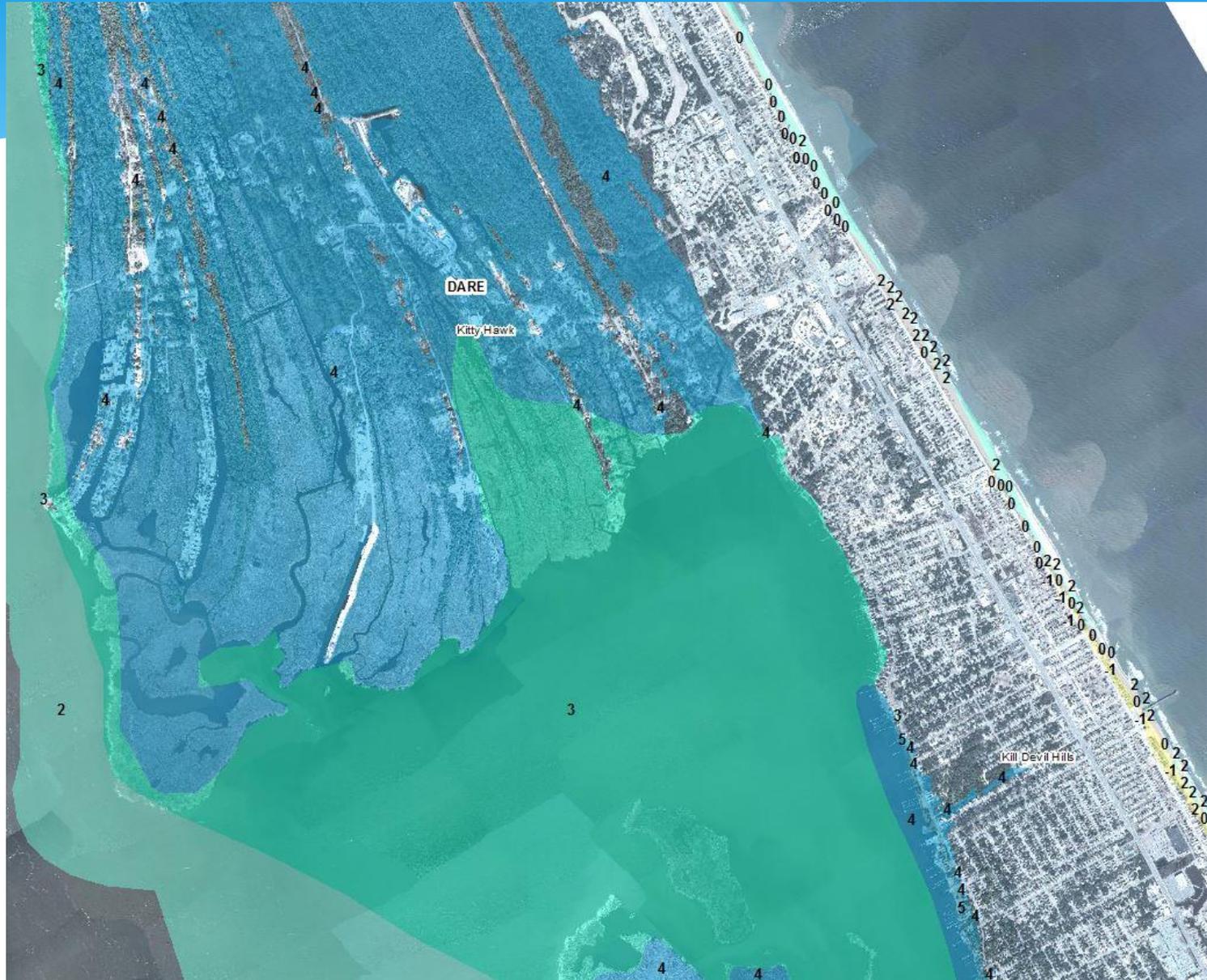
## Changed Buildings

### Description of Change to SFHA

- + Added
- x Dropped
- ↑ Zone Increase A to V
- ↓ Zone Decrease V to A
- Floodway or Future Conditions
- A Zone Change



# Changes near Kitty Hawk: BFE Decrease



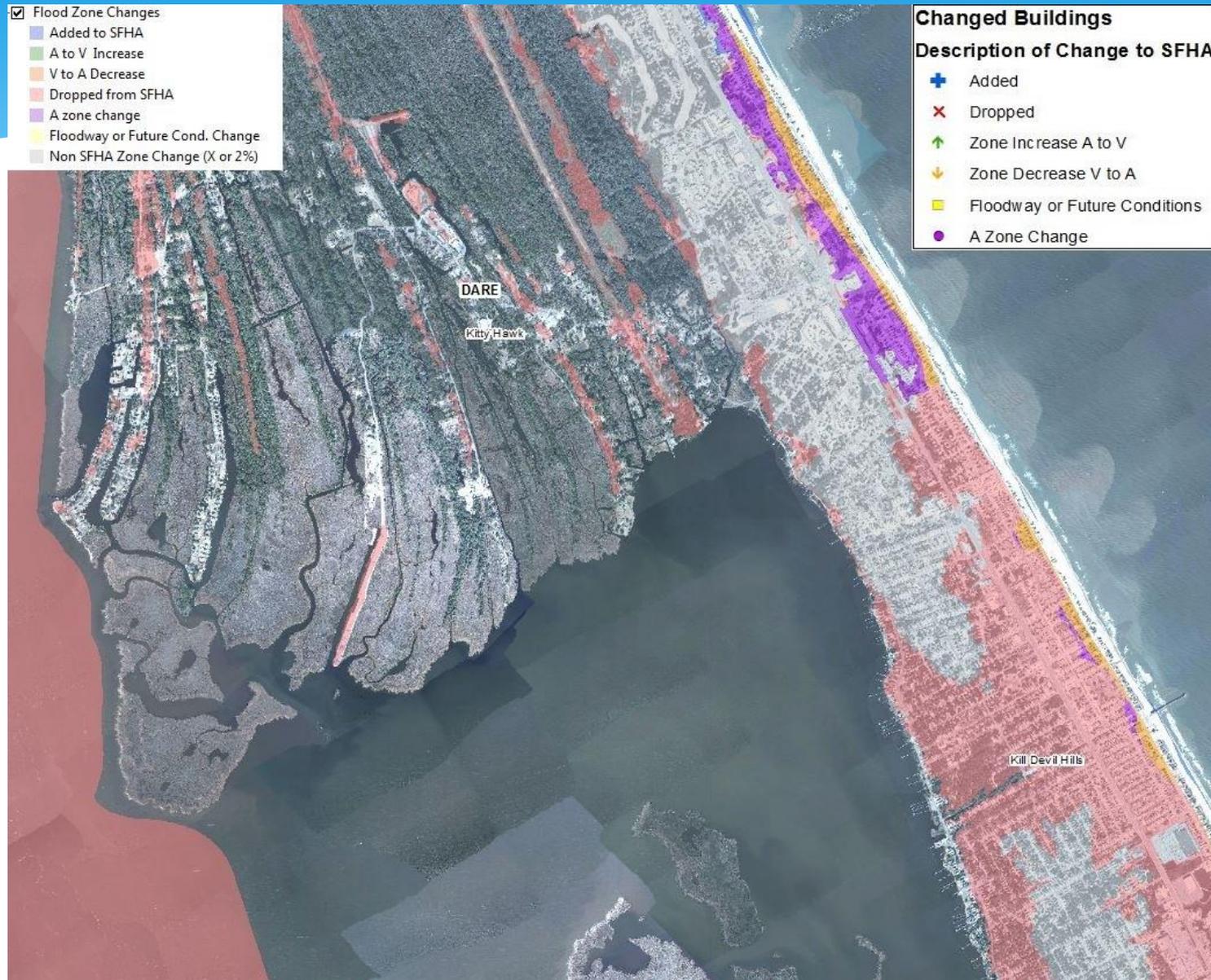
# Changes near Kitty Hawk: BFE Decrease

- Flood Zone Changes
  - Added to SFHA
  - A to V Increase
  - V to A Decrease
  - Dropped from SFHA
  - A zone change
  - Floodway or Future Cond. Change
  - Non SFHA Zone Change (X or 2%)

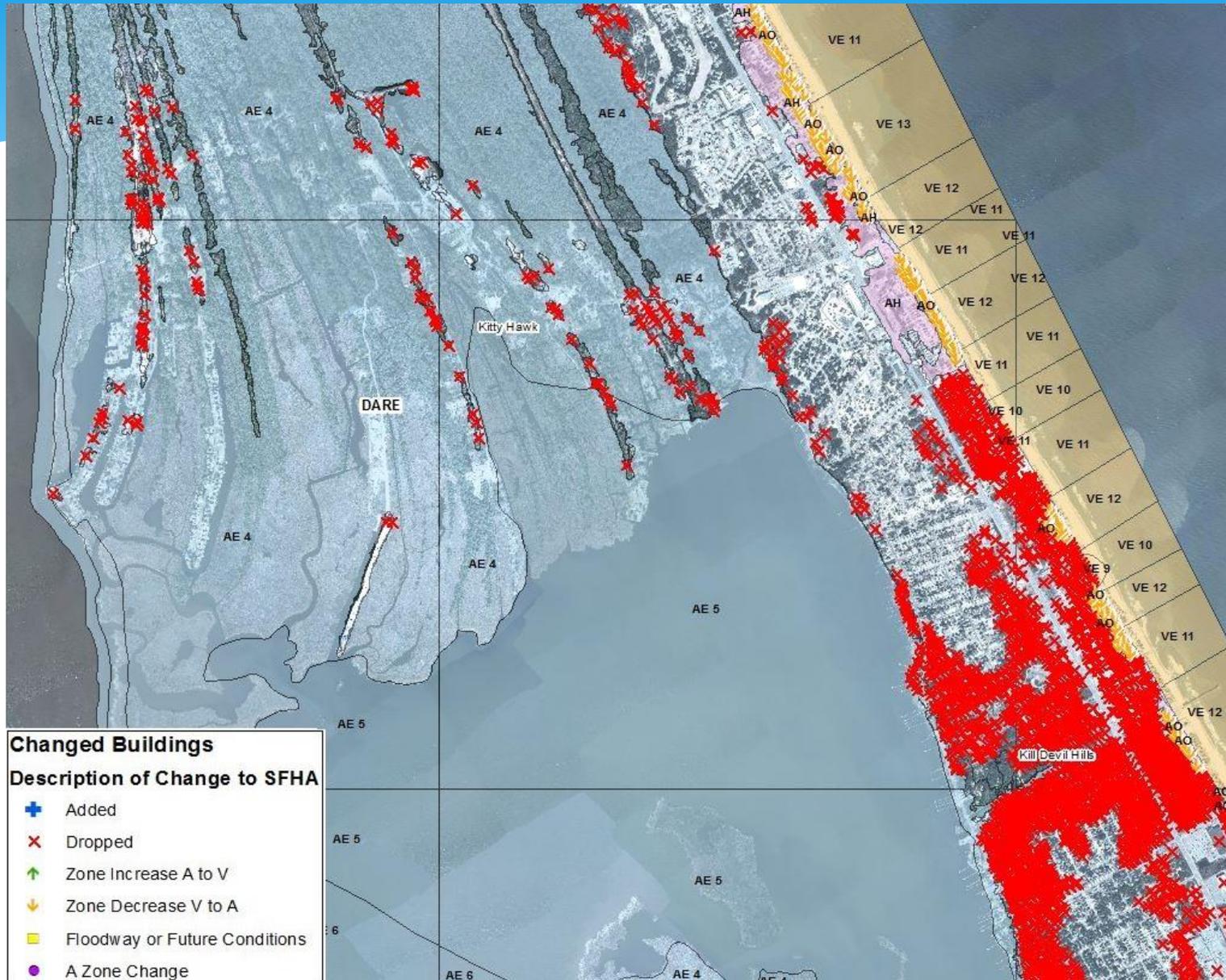
## Changed Buildings

### Description of Change to SFHA

- Added
- Dropped
- Zone Increase A to V
- Zone Decrease V to A
- Floodway or Future Conditions
- A Zone Change



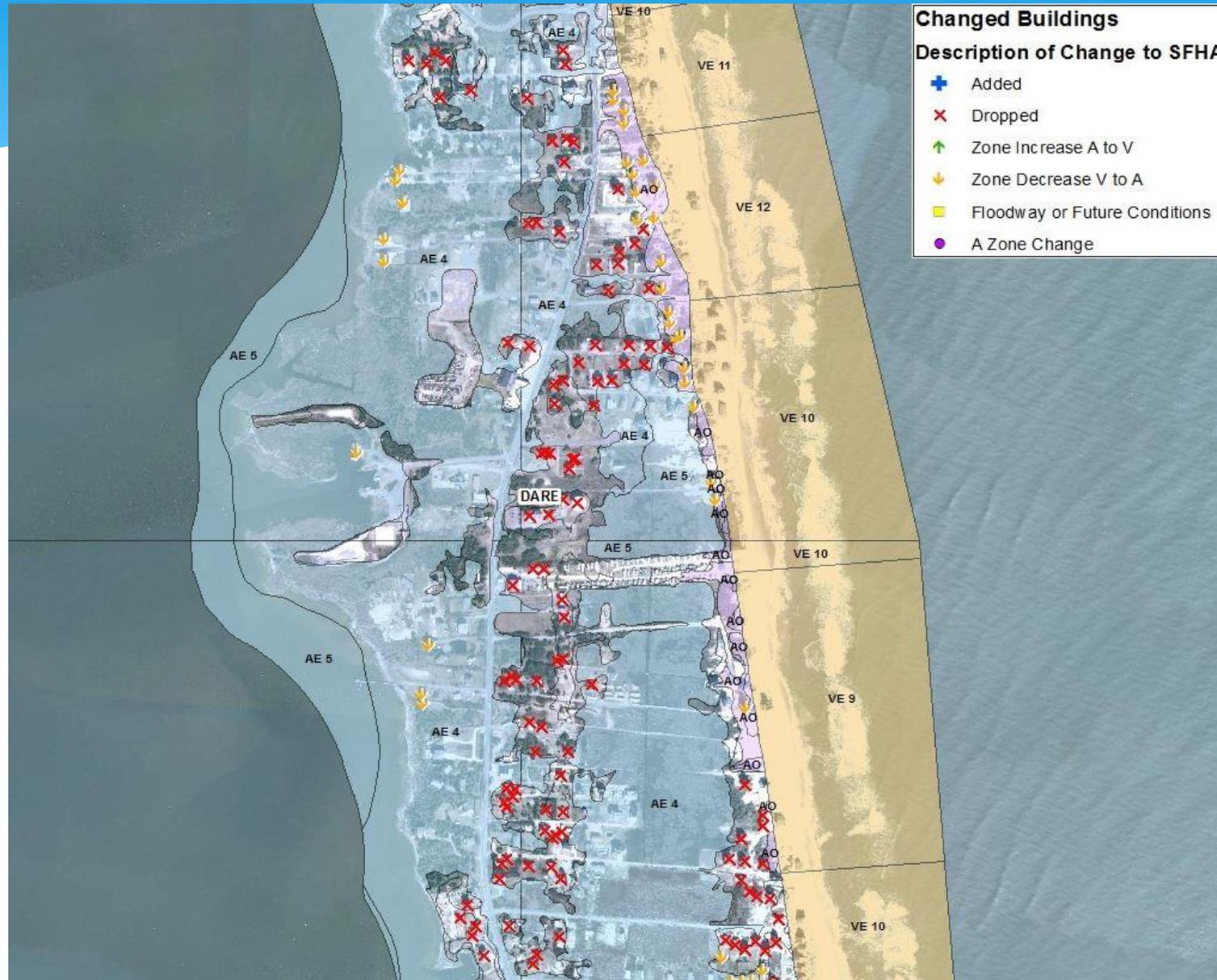
# Changes near Kitty Hawk: BFE Decrease



# Changes near Rodanthe: BFE Decrease



# Changes near Rodanthe: BFE Decrease



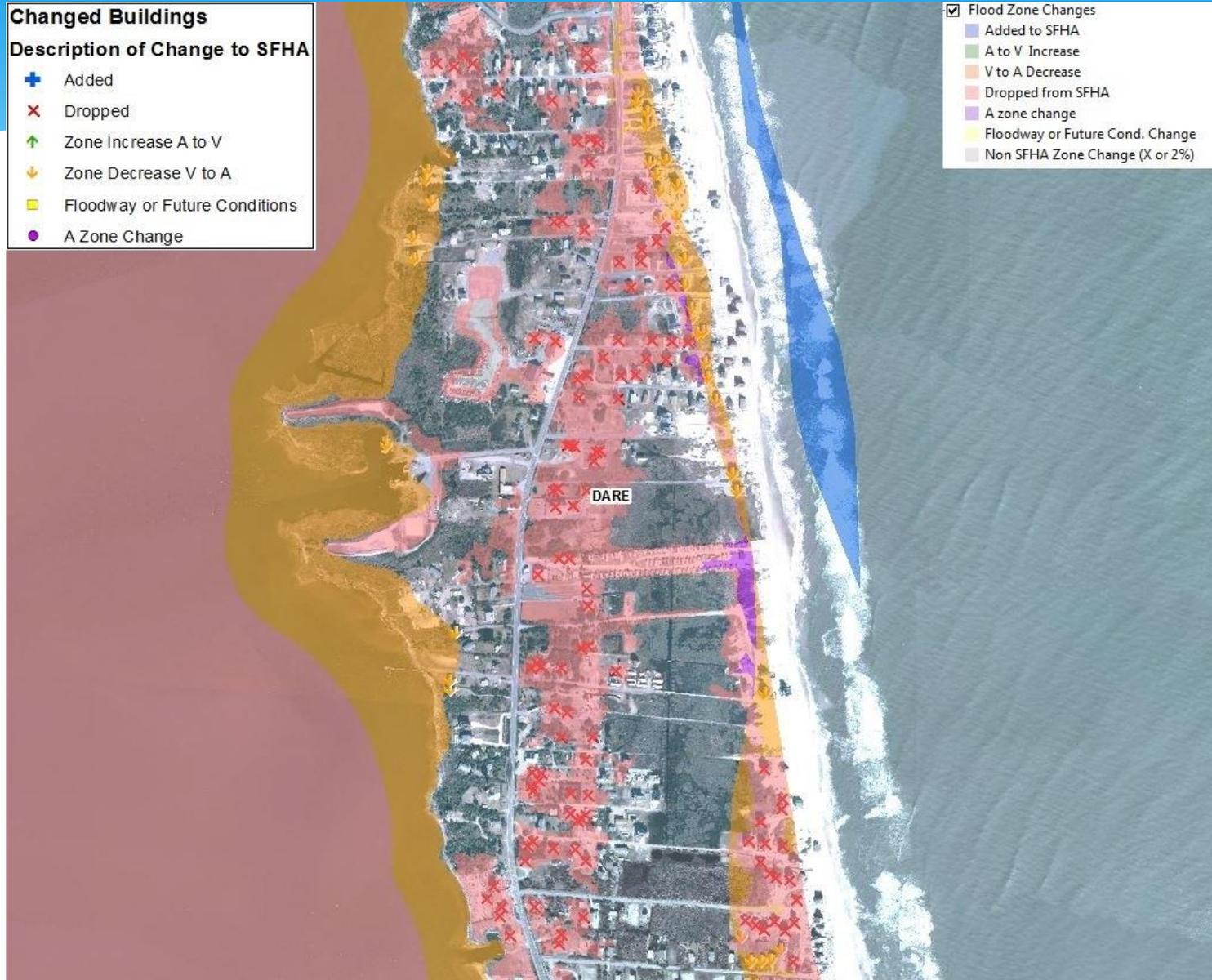
# Changes near Rodanthe: BFE Decrease

## Changed Buildings

### Description of Change to SFHA

- + Added
- x Dropped
- ↑ Zone Increase A to V
- ↓ Zone Decrease V to A
- Floodway or Future Conditions
- A Zone Change

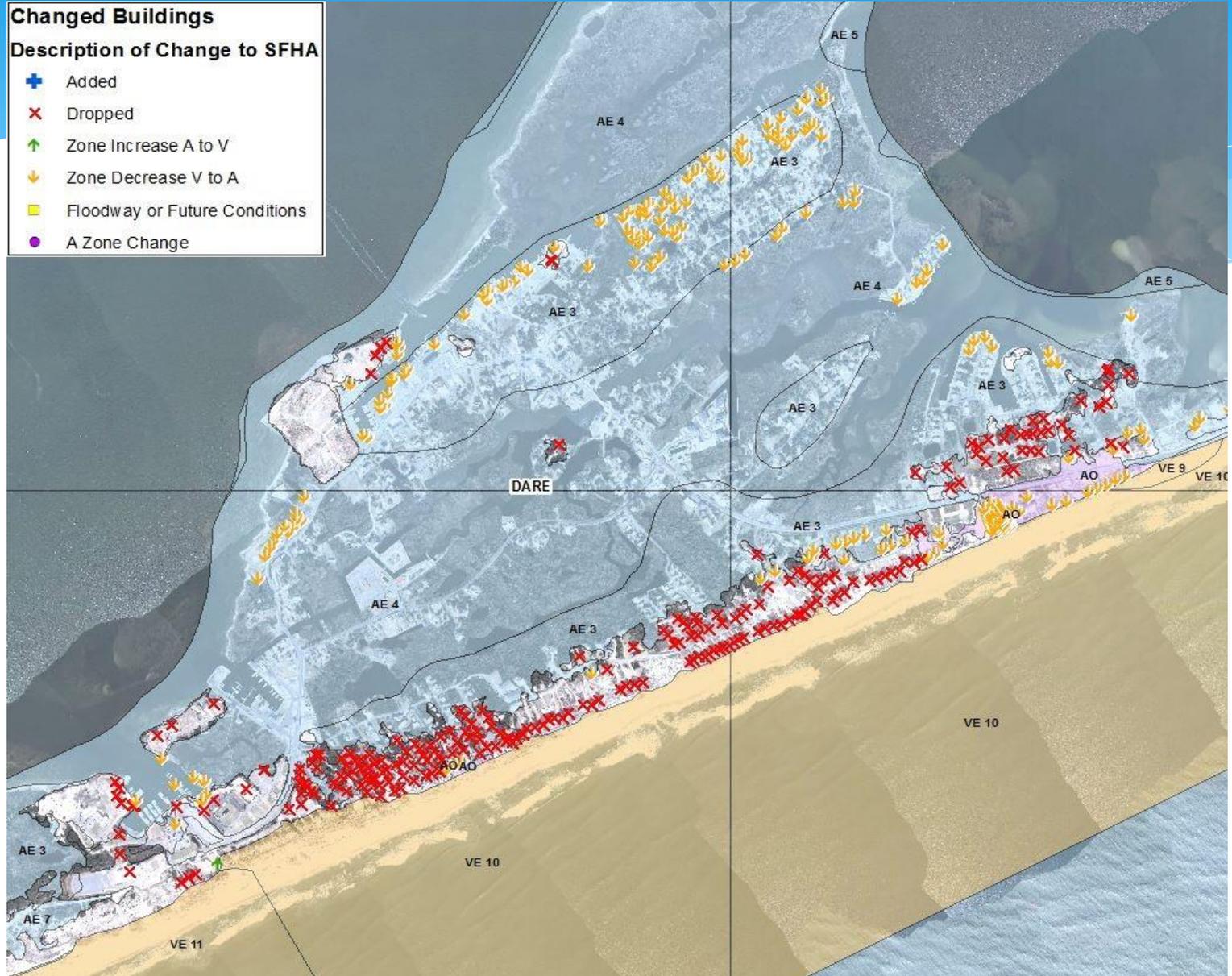
- Flood Zone Changes
  - Added to SFHA
  - A to V Increase
  - V to A Decrease
  - Dropped from SFHA
  - A zone change
  - Floodway or Future Cond. Change
  - Non SFHA Zone Change (X or 2%)





# Changes near Hatteras: BFE Decrease

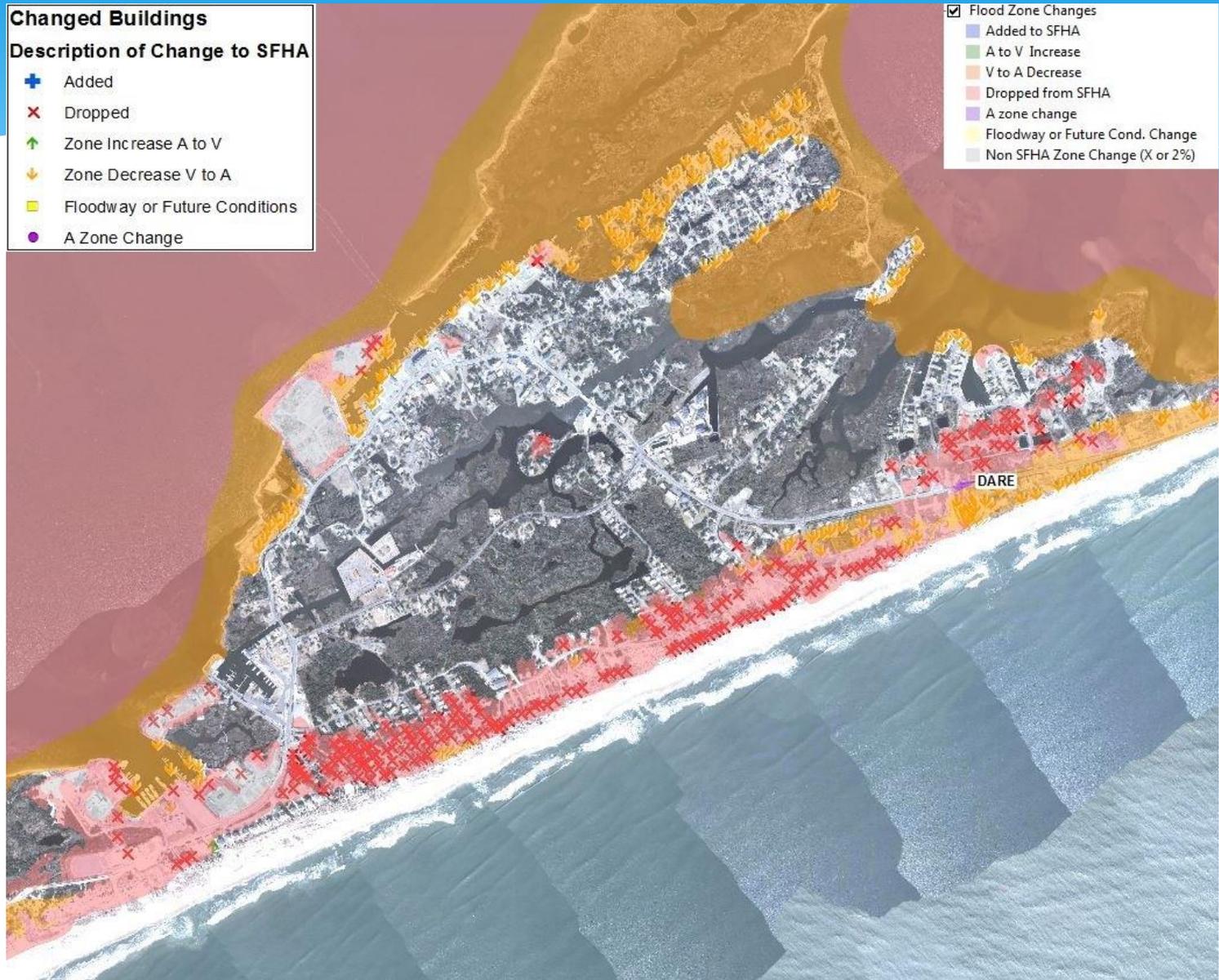
| Changed Buildings             |                               |
|-------------------------------|-------------------------------|
| Description of Change to SFHA |                               |
| +                             | Added                         |
| ×                             | Dropped                       |
| ↑                             | Zone Increase A to V          |
| ↓                             | Zone Decrease V to A          |
| ■                             | Floodway or Future Conditions |
| ●                             | A Zone Change                 |



# Changes near Hatteras: BFE Decrease

- Changed Buildings**
- Description of Change to SFHA**
- + Added
  - × Dropped
  - ↑ Zone Increase A to V
  - ↓ Zone Decrease V to A
  - Floodway or Future Conditions
  - A Zone Change

- Flood Zone Changes
- Added to SFHA
  - A to V Increase
  - V to A Decrease
  - Dropped from SFHA
  - A zone change
  - Floodway or Future Cond. Change
  - Non SFHA Zone Change (X or 2%)



# IMPACT ON LOMCs

- \* Community receives Summary of Map Actions (SOMA) listing all LOMAs, LOMRs, and LOMR-Fs issued since last FIRM effective date
- \* SOMA online at - <http://www.ncfloodmaps.com/soma.htm>

## PRELIMINARY SUMMARY OF MAP ACTIONS

Community: Durham County,  
Unincorporated Areas,  
North Carolina

Community No.: 370085

Revised Map Panels: 3710979600, 3710979700, 3710979800, 3720070600, 3720070700, 3720070800, 3720070900, 3720071600, 3720071700, 3720071800, 3720072700, 3720072800, 3720073700, 3720073800, 3720073900, 3720074700, 3720074800, 3720074900, 3720075700, 3720075800, 3720075900, 3720076800, 3720076900, 3720077800, 3720077900, 3720078900, 3720080000, 3720080100, 3720080200, 3720080300, 3720080500, 3720080600, 3720080700, 3720081100, 3720081200, 3720081300, 3720081400, 3720081500, 3720081600, 3720081700, 3720081800, 3720081900, 3720082300, 3720082400, 3720082500, 3720082600, 3720082700, 3720082800, 3720083000, 3720083300, 3720083400, 3720083500, 3720083600, 3720083700, 3720084000, 3720084100, 3720084200, 3720084300, 3720084400, 3720084500, 3720084600, 3720084700, 3720084800, 3720085000, 3720085100, 3720085200, 3720085300, 3720085400, 3720085500, 3720085600, 3720085700, 3720086000, 3720086100, 3720086200, 3720086300, 3720086400, 3720086500, 3720087000, 3720087100, 3720087200, 3720087300, 3720087400, 3720088000, 3720088100, 3720088200, 3720091000, 3720092000, 3720093000, and 3720094000

Date Issued: March 31, 2015

Page: 1 of 4

To assist your community in maintaining the Flood Insurance Rate Map (FIRM), we have summarized below the previous Letter of Map Change (LOMC) actions (i.e., Letters of Map Revision (LOMRs) and Letters of Map Amendment (LOMAs) that will be affected by the preparation of the enclosed revised FIRM panels.

### 1. LOMRs and LOMAs Incorporated

The LOMRs and LOMAs listed below have been incorporated into and are reflected on the final FIRM. However, until the revised FIRM becomes effective, the LOMRs and LOMAs will remain in effect.

| LOMC | Case No.    | Effective Date | Project Identifier                                  | New Panel  | New Zone |
|------|-------------|----------------|---|------------|----------|
| LOMR | 09-04-5688P | July 24, 2009  | NC-09-174 – Winsford in the Park at Northeast Creek | 3720073900 | AE       |

# IMPACT ON LOMCs

- ◎ SOMA shows how each LOMC was affected by the preliminary FIRM
- ◎ Possible Actions:
  - \* **Incorporated** (if LOMC can be mapped)
  - \* **Superseded** (if flood hazard was restudied and ground elevation is below new BFE)
  - \* **Revalidated** (if LOMC is unaffected by map revision but is too small to show on FIRM)
- ◎ Revalidation letters are sent to affected communities prior to the new FIRM effective date and will become effective the following day

# IMPACT OF NEW MAPS ON FLOOD INSURANCE RATES

# SAMPLE FLOOD INSURANCE RATES

|                |                 |
|----------------|-----------------|
| <b>Zone X</b>  | <b>\$1,402*</b> |
| <b>Zone AE</b> | <b>\$1,679</b>  |
| <b>Zone VE</b> | <b>\$3,854</b>  |

Rates are as of April 2016 and are subject to change

- \* If the structure has not had previous flood claims or received previous Federal Disaster Assistance payments, it might qualify for a Preferred Risk Policy in Zone X with the lowest possible rate of \$349 for \$100,000 building/\$40,000 contents coverage

Flood insurance coverage of \$100,000 building/\$25,000 contents on an NFIP compliant structure (free of obstruction/enclosure) with a policy deductible of \$1,000.

# SAMPLE FLOOD INSURANCE RATES

## Flood Insurance Premiums When Structure is Built ABOVE the BFE\*

| Lowest Floor Elevation | Rates Effective April 2016 |                |
|------------------------|----------------------------|----------------|
|                        | AE Zone                    | VE Zone        |
| <b>BFE</b>             | <b>\$1,679</b>             | <b>\$3,854</b> |
| <b>BFE + 1 ft.</b>     | <b>\$849</b>               | <b>\$3,066</b> |
| <b>BFE + 2 ft.</b>     | <b>\$552</b>               | <b>\$2,269</b> |
| <b>BFE + 3 ft.</b>     | <b>\$444</b>               | <b>\$1,680</b> |
| <b>BFE + 4 ft.</b>     | <b>\$423</b>               | <b>\$1,499</b> |

\* Flood insurance coverage of \$100,000 building/\$25,000 contents on an NFIP compliant structure (free of obstruction/enclosure) with a policy deductible of \$1,000.

# SAMPLE FLOOD INSURANCE RATES

## Flood Insurance Premiums When Structure is Built BELOW the BFE\*

| Lowest Floor Elevation | Rates Effective April 2016 |                 |
|------------------------|----------------------------|-----------------|
|                        | AE Zone                    | VE Zone         |
| BFE                    | \$1,679                    | \$3,854         |
| BFE - 1 ft.            | \$3,945                    | \$4,707         |
| BFE - 2 ft.            | Submit for Rate            | \$5,803         |
| BFE - 3 ft.            | Submit for Rate            | \$7,116         |
| BFE - 4 ft.            | Submit for Rate            | Submit for Rate |

\* Flood insurance coverage of \$100,000 building/\$25,000 contents on an NFIP compliant structure (free of obstruction/enclosure) with a policy deductible of \$1,000.

# LOCAL FREEBOARD & NFIP STATISTICS

| <b>Community</b>                    | <b>Joined NFIP<br/>(Regular Program)</b> | <b>Freeboard</b> | <b>Policies</b> | <b>Insurance in<br/>Force</b> |
|-------------------------------------|--|------------------|-----------------|-------------------------------|
| <b>Dare County</b>                  | <b>10/6/1978</b>                         | <b>1 foot</b>    | <b>9,092</b>    | <b>\$2,242,658,000</b>        |
| <b>Town of Duck</b>                 | <b>11/6/2003</b>                         | <b>-</b>         | <b>554</b>      | <b>\$175,338,600</b>          |
| <b>Town of<br/>Kill Devil Hills</b> | <b>5/4/1973</b>                          | <b>-</b>         | <b>4,075</b>    | <b>\$943,147,300</b>          |
| <b>Town of Kitty<br/>Hawk</b>       | <b>10/6/1978</b>                         | <b>1 foot</b>    | <b>1,473</b>    | <b>\$383,315,800</b>          |

# LOCAL FREEBOARD & NFIP STATISTICS

| <b>Community</b>                   | <b>Joined NFIP<br/>(Regular Program)</b> | <b>Freeboard</b> | <b>Policies</b> | <b>Insurance in<br/>Force</b> |
|------------------------------------|--|------------------|-----------------|-------------------------------|
| <b>Town of Manteo</b>              | <b>1/5/1973</b>                          | <b>1 foot</b>    | <b>709</b>      | <b>\$169,063,000</b>          |
| <b>Town of Nags<br/>Head</b>       | <b>11/10/1972</b>                        | <b>1 foot</b>    | <b>3,364</b>    | <b>\$923,611,000</b>          |
| <b>Town of<br/>Southern Shores</b> | <b>5/13/1972</b>                         | <b>2 feet</b>    | <b>1,165</b>    | <b>\$347,409,400</b>          |

# IMPACT ON FLOOD INSURANCE RATES AS A RESULT OF NEW LEGISLATION

Highlights of the  
Homeowners Flood Insurance  
Affordability Act of 2014 (HFIAA)

# HFIAA Provisions

## \*Rate-increase limitations

- Limit increases for individual premiums to 18% of premium
- Limit increases for average rate classes to 15%
- The annual surcharge and Federal Policy Fee are not included in the rate calculation and could result in the total amount charged to the policyholder to increase more than 18%

## \*Deductibles

- Maximum residential deductible limits are increased from \$5,000 to \$10,000.

# What's Changing for Pre-FIRM

## \* **Subsidized rates to be *phased out***

- Non-primary residences
- Business properties
- Severe repetitive loss properties (1-4 residences), and properties where claims payments exceed fair market value

## \* **New policies to be *issued at full-risk rates***

- After a lapse in insurance coverage
- Properties for which there was a refusal to mitigate

# What's Changing for Pre-FIRM

## \*Pre-FIRM Non-Primary Residence Policies

- Includes vacation homes, secondary residences, and rental properties
- 25% annual increase at policy renewal until premium reaches full-risk rate

## \*Pre-FIRM Business Policies

- Future rates will increase by 25% per year until premium reaches full-risk rate until FEMA can separate businesses from other non-residential structures

# HFIAA Provisions

## \*Federal Reserve Fund

- The Federal Reserve Fund was implemented in 2013 to help cover costs when claims exceed the annual premium collected by the NFIP.
- On April 1, 2015, the Federal Reserve Fund assessment was added to additional policies.

| Policy                          | 2014 Fee | 2015 Fee | 2016 Fee |
|---------------------------------|----------|----------|----------|
| Preferred Risk Policy (PRP)     | 0%       | 10%      | 15%      |
| Property Newly Mapped into SFHA | 0%       | 15%      | 15%      |
| All other policies              | 5%       | 15%      | 15%      |

# HFIAA Provisions

## \*Federal Policy Fee

- The Federal Policy Fees have increased for all.
- Federal Policy Fee for Preferred Risk Policies is \$25 (\$22 in April 2015).
- Federal Policy Fee for all other policies is \$50 (\$45 in April 2015).

# HFIAA Provisions

- \* **All policies get a new annual surcharge based on occupancy**
  - \$25 for primary residential: single-family and individual condominium units
  - \$250 for non-residential properties, non-primary residential properties, and multifamily residential
  - Surcharges would be deposited in the NFIP Reserve Fund, which was established to ensure funds are available for meeting the expected future obligations of the NFIP

# HFIAA Provisions

## \*Properties Newly Mapped in SFHA

- Eligible to receive a Preferred Risk Policy for 1 year after the maps become effective. However, the Federal Policy Fee will be \$50 rather than \$22.
- Rates at renewal will increase no more than 18% each year.
- Grandfathering remains a cost-saving option for policyholders when new maps show their structure in a higher risk area (increased BFE or Zone AE to Zone VE).

# Grandfathering

- \*When the FIRM changes, the NFIP provides a lower-cost flood insurance rating option referred to as “grandfathering”. Grandfathering is available to property owners who:**
  - Have flood insurance policies in effect when the new flood maps become effective and maintain continuous coverage; OR
  - Have built in compliance with the FIRM in effect at the time of construction.

# FLOODPLAIN MANAGEMENT STANDARDS

The slide features a solid blue background. At the bottom, there are several overlapping, wavy, light blue shapes that create a sense of movement or water. The text is centered in the upper half of the slide.

# NC QUICK GUIDE

## North Carolina Floodplain Management



2008 Quick Guide



Floodplain Management Branch  
[www.nccrimecontrol.org/NFIP](http://www.nccrimecontrol.org/NFIP)

North Carolina Department of  
Crime Control and Public Safety

Available online at: [www.ncfloodmaps.com/pubdocs/nc\\_quick\\_guide\\_2008.pdf](http://www.ncfloodmaps.com/pubdocs/nc_quick_guide_2008.pdf)

# FLOODPLAIN MANAGEMENT STANDARDS

- ⦿ No changes to development standards as a result of the new mapping:
  - ⦿ “Development” definition per 44 CFR 59 is the same
- ⦿ A Floodplain Development Permit is required for all ‘development in the SFHA’
  - ⦿ Keep records of all Permits, Inspections, C.O.’s, Variances, etc.
- ⦿ A No-Rise/No Impact Certification from a PE is required for any development in the Floodway or non-encroachment area

# IMPACT OF NEW MAPS

The slide features a solid blue background. At the bottom, there are several overlapping, wavy, light blue shapes that create a sense of movement and depth, resembling stylized waves or a modern graphic design element.

# IMPACT ON DEVELOPMENT REQUIREMENTS

- \* When FEMA publishes new flood maps or new regulations are adopted, the compliance of existing development is based on:
  - \* the flood maps and regulations that were in effect at the time of the building permit was issued, or
  - \* the date of construction, or
  - \* the date of last substantial damage and/or substantial improvement – **whichever is later**

# USE OF PRELIMINARY DATA

- ⦿ For areas currently in Zone A
  - \* Use of Preliminary data is required
- ⦿ For areas currently in Zones X (Shaded or Unshaded):
  - \* Use of Preliminary data is not required:
    - \* May be used in cases where the structure or development will be located in Zone AE
- ⦿ If communities wish to enforce more stringent data, they are encouraged to adopt the Preliminary data.

# FURTHER INFORMATION

## ◎ Best Available Data Fact Sheet

- \* Available online at [www.ncfloodmaps.com/fact\\_sheets.htm](http://www.ncfloodmaps.com/fact_sheets.htm)
- \* Provides information as to what data may be used immediately from the preliminary DFIRM and FIS Report as best available data for Zone A areas (BFEs, floodway/non-encroachment area data)



### Using Data from Preliminary Flood Maps

Preliminary flood hazard maps contain valuable information that can be used for floodplain management before they become effective. This fact sheet provides guidance on how these data can and should be used in accordance with National Flood Insurance Program (NFIP) regulations, at 44 Code of Federal Regulations, Section 60.3, under specific Subparagraphs cited throughout this document.

#### Background

A Flood Insurance Study (FIS) uses detailed hydrologic and hydraulic analyses to model the 1% annual chance flood event, determine Base Flood Elevations (BFEs), and designate floodways and flood risk zones (e.g., Zones AE and VE). The flood hazard data are shown in tables in an FIS Report, shown graphically as flood profiles, and portrayed planimetrically on a Flood Insurance Rate Map (FIRM).

New flood hazard information is released to the public in a preliminary FIS Report and FIRM for review and comment during the statutory 90-day appeal period. The preliminary BFEs and floodway data are subject to change until a notice of final flood elevation determination is provided to the community in a Letter of Final Determination (LFD) by FEMA.

Most communities participating in the NFIP have a FIRM depicting areas expected to be inundated during the 1% annual chance flood. These Special Flood Hazard Areas (SFHAs) are determined by using one of two types of engineering methods: 1) detailed studies which determine BFEs, and 2) approximate studies which do not determine BFEs and are designated as Zone A.

#### Applicability

When land has been designated as being located in the SFHA on a community's Flood Hazard Boundary Map (FHBM) or FIRM, and no BFEs or floodway have been identified, communities are required to apply the provision contained in Subparagraph 60.3(b)(4) requiring communities to:

*Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source...*

Communities should use preliminary flood data and require that new construction and/or substantial improvement projects be built with the lowest floor elevated to or above the preliminary BFE. Communities should also prohibit any encroachment in the floodway that would result in any increase in base flood levels during the occurrence of a 1% annual chance flooding event. Subparagraph 60.3(b)(4) also states that available BFE or floodway data should be used as long as they:

*Reasonably reflect flooding conditions expected during the base flood; are not known to be scientifically or technically incorrect; and represent the best data available.*

*Data from a preliminary FIS constitute available data.*

#### Use of Preliminary FIS Data Land Currently within Zone A

For areas currently identified within a Zone A on the community's effective FHBM or FIRM, the BFE and floodway/non-encroachment data from a preliminary FIS Report constitute available data under Subparagraph 60.3(b)(4). The requirement in Subparagraph 60.3(b)(4) is an important floodplain management tool for reducing flood damage in areas currently designated as Zone A. Communities must regulate floodplain development using the data in the preliminary FIS Report and FIRM under

Accessing Digital Flood Hazard  
Data from the  
Flood Risk Information System  
(FRIS)

**<http://fris.nc.gov/fris/>**



## Am I at risk of flooding?

General Public

Enter all or part of your address and click GO.

Address, City, or ZIP

OR select a county

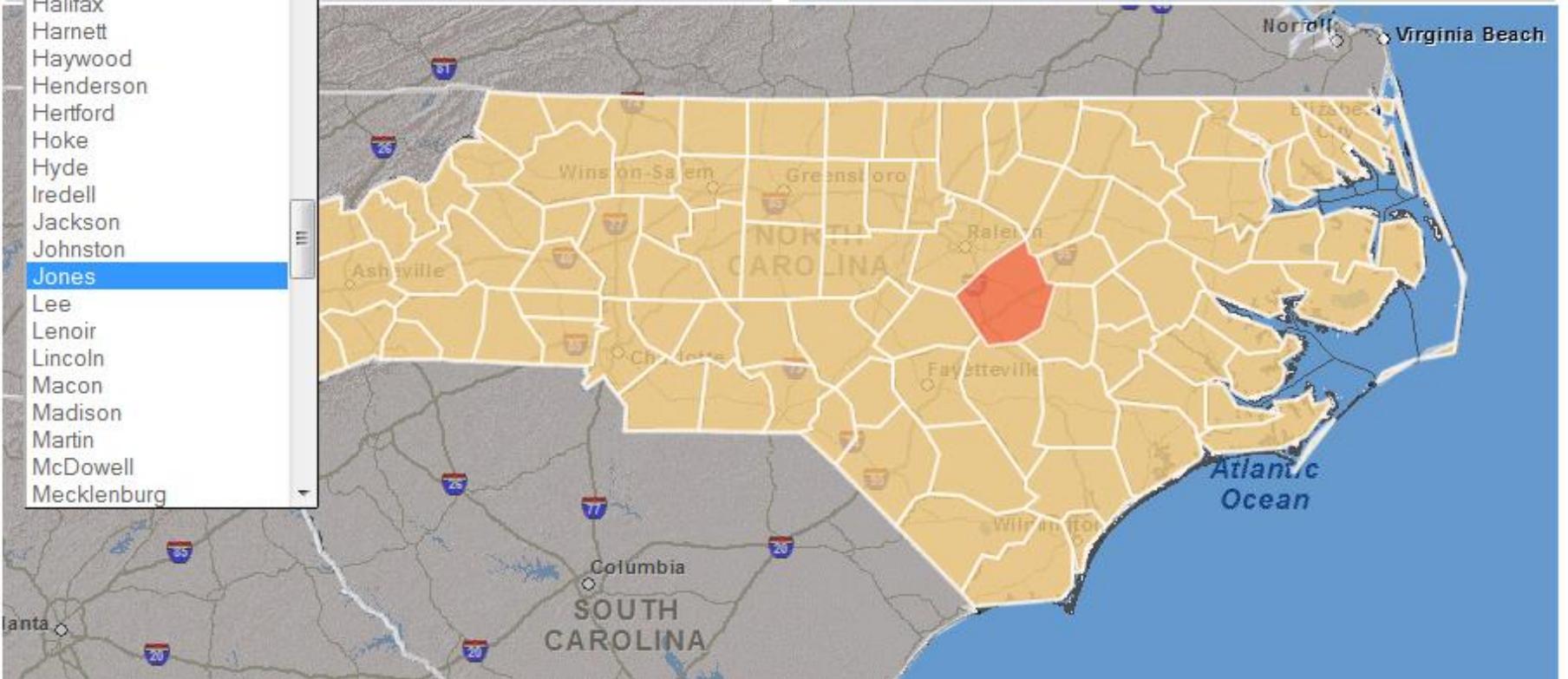
County  Johnston, North Carolina

- Guilford
- Halifax
- Harnett
- Haywood
- Henderson
- Hertford
- Hoke
- Hyde
- Iredell
- Jackson
- Johnston
- Jones**
- Lee
- Lenoir
- Lincoln
- Macon
- Madison
- Martin
- McDowell
- Mecklenburg

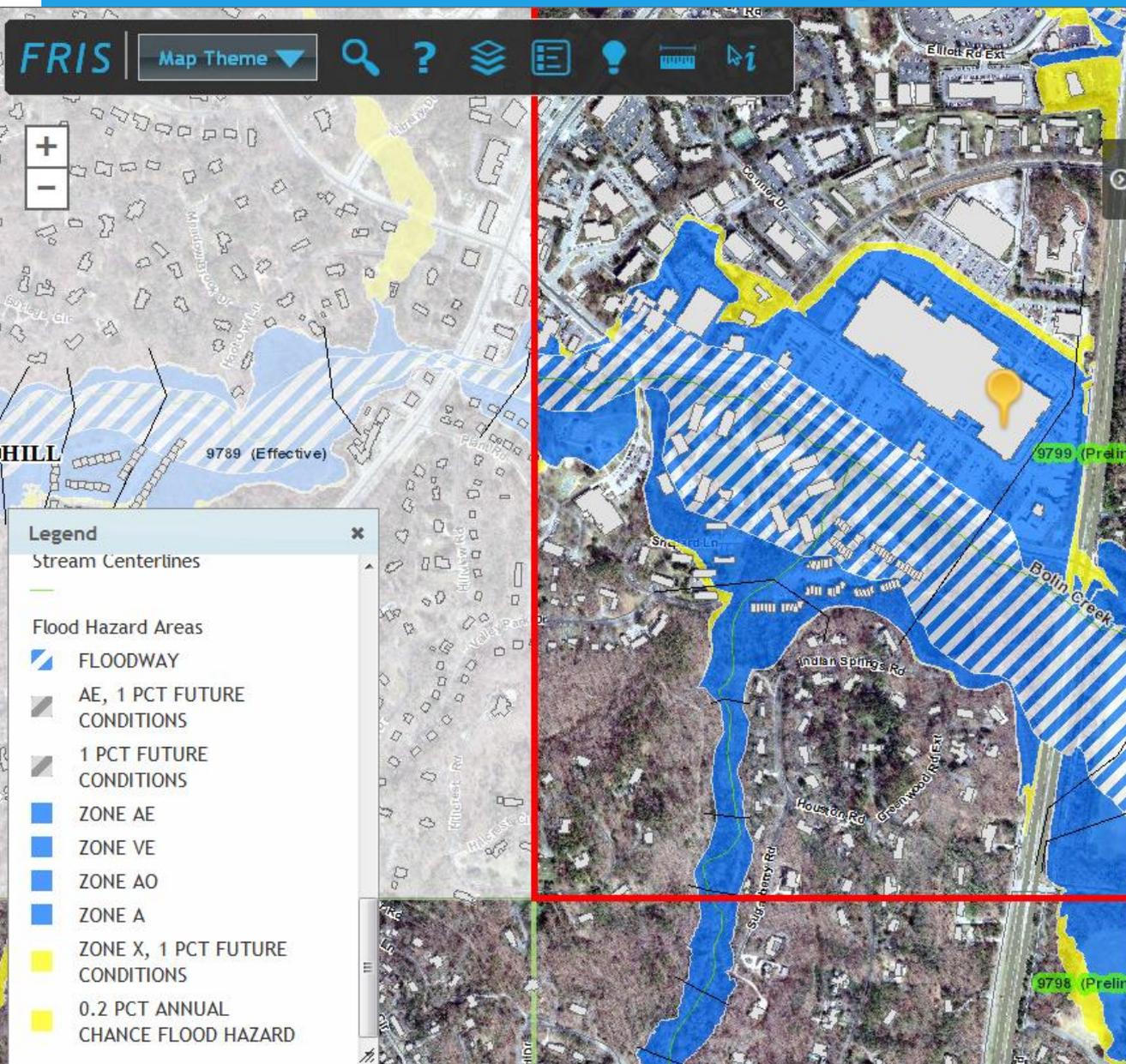
## Benefits of Floodplain Mapping

Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss. North Carolina's Digital Flood Insurance Rate Maps (DFIRM) enable business leaders and residents to more accurately predict flood hazards and prepare for flood risks.

Go to [NC Floodmaps](#) for more information.



# FRIS FIRM Map Symbolology



Who Am I : General Public  Preliminary

**Flood Information**

Preliminary Panels are outlined in  ?

**This panel's status is Preliminary.**

**213 S Estes Dr, Chapel Hill, NC**  
[Google Street View](#)

Flood Zone: **AE**

Flood Source: Bolin Creek

Base Flood Elevation: 261.5 ft

County: Orange

Political Area: Town Of Chapel Hill

CID: 370180

Panel: 9799

Map Number: 3710979901L

Preliminary Issuance Date: **08/30/13**

Latitude: 35.92702

Longitude: -79.02612

**Risk Information**

**Financial Vulnerability**

**FIS Reports**

**Map Export**

**Data Export**

# FRIS FIRM Map Symbology

The screenshot displays the FRIS FIRM Map Symbology interface. The main map shows a coastal town with various flood zones highlighted in yellow and blue. A red line outlines a specific area on the map. The interface includes a top navigation bar with the FRIS logo, a 'Map Theme' dropdown, and several utility icons. A left sidebar contains zoom controls (+/-). A right sidebar provides detailed information for the selected panel (0640).

**Map Labels:** 0630 (Preliminary), 0640 (Preliminary), 0539 (Preliminary), 0549 (Preliminary)

**Who Am I:** General Public | Preliminary

**Flood Information**

Preliminary Panels are outlined in  ?

**This panel's status is Preliminary.**

**Map Location**

Flood Zone: **VE**

Flood Source: Atlantic Ocean

Base Flood Elevation: 10 ft **More**

County: Dare

Political Area: Dare County

CID: 375348

Panel: 0640 **Download**

Map Number: 3730064000K

Preliminary Issuance Date: **6/30/2016**

Latitude: 35.35337

Longitude: -75.49987

**FIS Reports**

**Map Export**

**Data Export**

# FRIS Data Downloads

FRIS

Flood Risk Information System



View Interactive Map



## Data Search

County:

DFIRM:

Stream:

**i** Select a DFIRM Panel to view additional datasets.  
Select a stream to see Engineering Models.

### Statewide Datasets

DFIRM Panel Shapefile

NCFMP Geodatabase Dictionary

LiDAR Metadata

### Edgecombe County

Personal Geodatabase

LIDAR DEM 50

LIDAR DEM 20

LIDAR Bare Earth

FIS Report

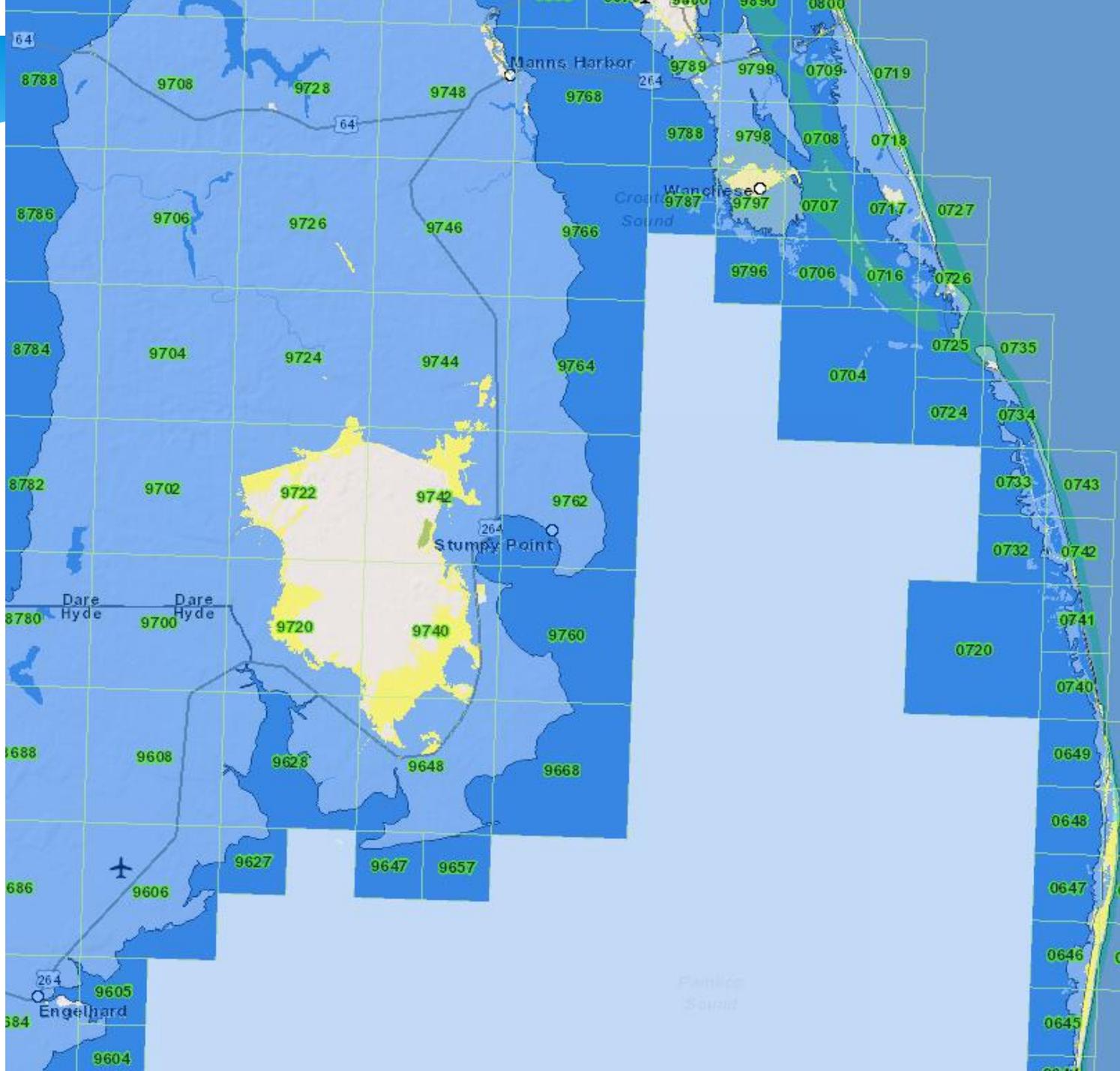
Preliminary FIS Report

DFIRM: Panel 4746

### Engineering Models

**i** Click the Model name to download the .zip file.

| Model                                 | Start   | End  | Study Type             |
|---------------------------------------|---|--|------------------------|
| <a href="#">Savage Mill Run Model</a> | Approximately 458 feet downstream of Mill Pond Road | Approximately 1.1 miles upstream of Mill Pond Road | LIMITED DETAILED STUDY |





# Changes Since Last FIRM

Click 'LAYERS' on the Tool bar (for Map Contents)

Click 'LEGEND'

Green = Decrease

Red = Increase

The screenshot displays the FRIS software interface. At the top, there is a dark toolbar with the 'FRIS' logo on the left, a 'Map Theme' dropdown menu, and several icons including a magnifying glass, a question mark, a stack of layers, a list icon, a lightbulb, a ruler, and a location pin. Below the toolbar, the 'Map Contents' panel is open, showing a list of map layers with checkboxes. The 'Changes Since Last Firm' layer is checked. To the right of the 'Map Contents' panel, the 'Legend' panel is also open, showing two legend sections. The first section is 'Floodway Area Change' and the second is 'Special Flood Hazard Area Change'. Both sections have three color-coded categories: a green square for 'Decrease', a red square for 'Increase', and a yellow square for 'Negligible Change'. Below these is the text 'No Change'. The background of the software shows a map of a residential area.

FRIS | Map Theme ▼

Map Contents

- Flood Zones
- Cross Sections
- DFIRM Panels
- Model Extents
- LOMR
- Building Footprints without Risk
- Building Footprints with Risk
- Flood Depth
- Flood Probability
- Flood Vulnerability
- Benchmarks
- Base Map
- Damage Hotspots
- Political Areas
- Changes Since Last Firm
- Structures
- Revisions

Legend

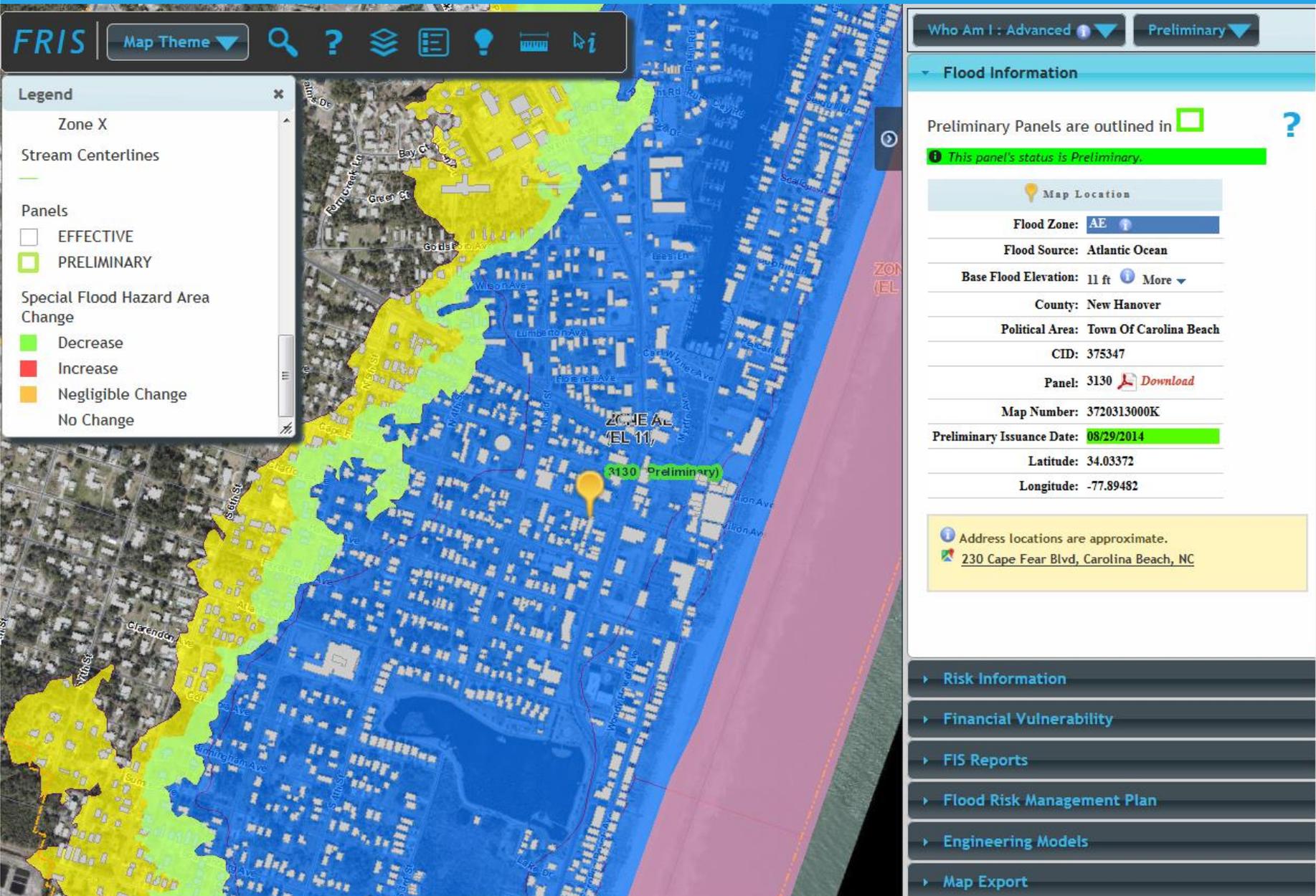
Floodway Area Change

- Decrease
- Increase
- Negligible Change
- No Change

Special Flood Hazard Area Change

- Decrease
- Increase
- Negligible Change
- No Change

# Changes Since Last FIRM



# FRIS Display View/Print/Map Export

**FRIS** Change Map

Who Am I : General Public Effective

Flood Information

Risk Information

Financial Vulnerability

Map Export

Select a map template

- Current View
- Regulatory**

Select PDF paper size

- 8.5 x 11**
- 11 x 17

Print

Who Am I : General Public Effective

Flood Information

Click the map to view information.

Map Location

Flood Zone: AE

Flood Source: East Tarboro Canal

Base Flood Elevation: 45.8 ft

Vertical Datum: NAVD88

County: Edgecombe

Political Area: Town of Tarboro

Jurisdiction: Town of Tarboro

CID: 370094

Panel: 4738

Map Number: 3720473800J

Effective Date: 11/03/04

Latitude: 35.9037

Longitude: -77.51986

Risk Information

Financial Vulnerability

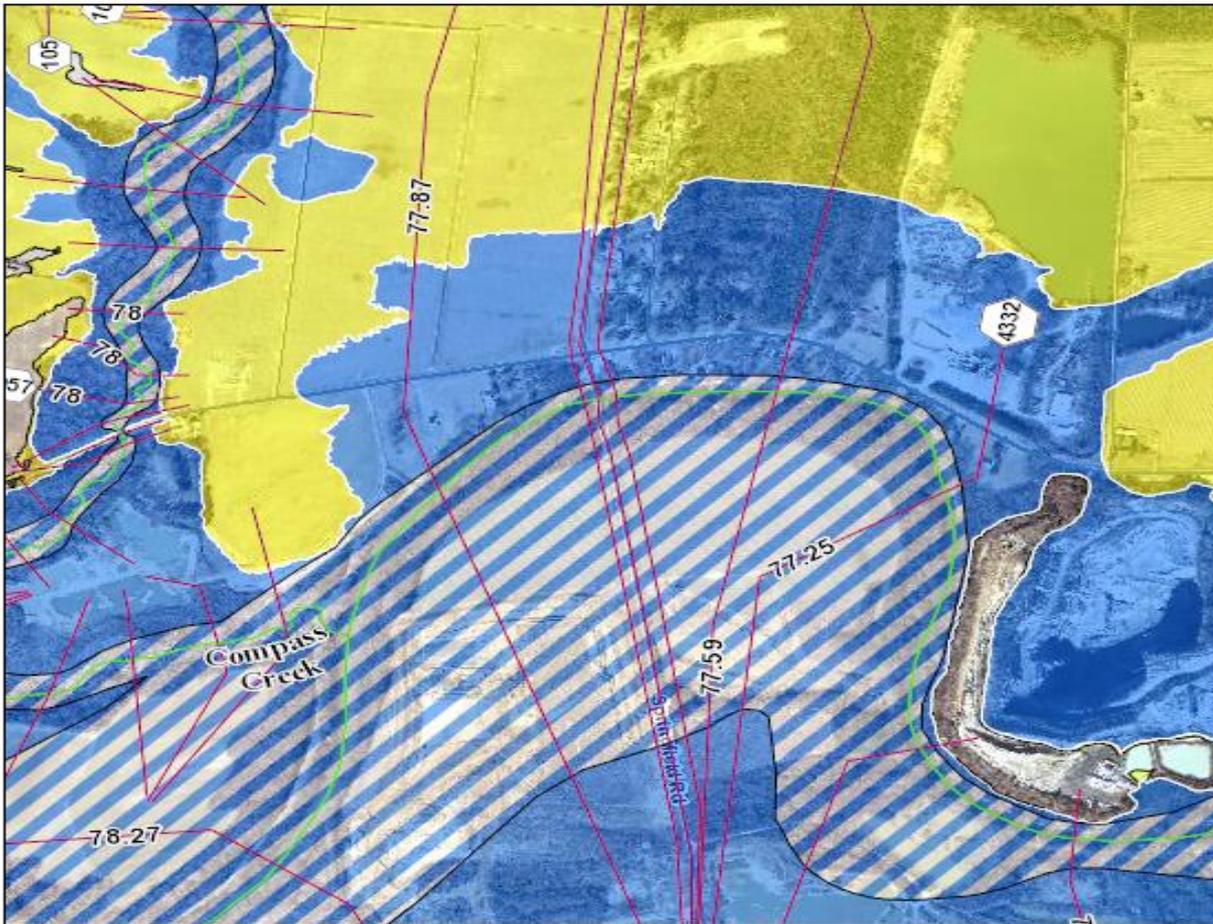
Map Export

Data Export

# FRIS Produce a FIRMETTE

Northing = 469,057, Easting = 1,547,434

Northing = 468,887, Easting = 1,558,705



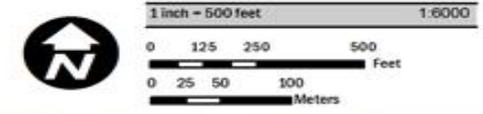
Northing = 459,749, Easting = 1,547,292

Northing = 809,320, Easting = 2,371,197



|  |   |
|--|---|
|  | Without Base Flood Elevation (BFE)<br><i>Zone X, X1, X2</i>                         |
|  | With BFE or Depth<br><i>Zone AE, AH, AO, A1, A2, AP</i>                             |
|  | Regulatory Floodway<br><i>Zone R</i>  |
|  | 0.2% Annual Chance Flood Hazard<br><i>Zone X</i>                                    |
|  | Future Conditions 1% Annual Chance Flood Hazard<br><i>Zone X</i>                    |
|  | Areas Determined to be Outside the 0.2% Annual Chance Flood Hazard<br><i>Zone X</i> |
|  | Jurisdiction Boundary   |
|  | FIRM Panel Boundary   |

North Carolina State Plane Projection Feet (Zone 3200)  
Datum: NAD 1983 (Horizontal), NAVD 1988 (Vertical)



**FEMA National Flood Insurance Program**

NATIONAL FLOOD INSURANCE PROGRAM  
FLOOD INSURANCE RATE MAP

**NORTH CAROLINA**  
Panel(s): 3860, 3861, 3870, 3871

CONTAINS:  
COMMUNITY CID  
City of Rocky Mount 370092

**Notice to User: The Map Number(s) shown below should be used when placing map orders; the Community Number(s) shown above should be used on insurance applications for the subject community.**

SELECTED PANELS:

| MAP NUMBER  | EFFECTIVE DATE |
|-------------|----------------|
| 3720386000J | 11/03/04       |
| 3720386100J | 11/03/04       |
| 3720387000J | 11/03/04       |
| 3720387100J | 11/03/04       |




This is an official copy of a portion of the above referenced flood map. This map incorporates changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov).



## FEMA: National Flood Insurance Program



Page 2 of 2

**Panel(s):** 0810,0820,0710,0720

**CONTAINS:**

**COMMUNITY:** CID  
CITY OF DURHAM 370086

**Notice to User:** The Map Number(s) shown below should be used when placing map orders; the Community Number(s) shown above should be used on insurance applications for the subject community.

**SELECTED PANELS:**

| MAP NUMBER  | EFFECTIVE DATE |
|-------------|----------------|
| 3720661000K | 06/02/07       |
| 3720662000K | 06/02/07       |
| 3720071900K | 06/02/07       |
| 3720072900K | 06/02/07       |

### NOTES TO USERS

Base map information and geospatial data used to develop this FIRMette were obtained from various organizations, including the participating local community(ies), state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired by the State in 2010. Information and geospatial data supplied by the local community(ies) that met FEMA base map specifications were considered the preferred source for development of the base map.

See geospatial metadata for the associated digital FIRMette for additional information about base map preparation. Base map features shown on this FIRMette, such as corporate limits, are based on the most up-to-date data available at the time of publication. Changes in the corporate limits may have occurred since this map was published. Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain roads that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

See geospatial metadata for the associated digital FIRMette for additional information about base map preparation. Base map features shown on this FIRMette, such as corporate limits, are based on the most up-to-date data available at the time of publication. Changes in the corporate limits may have occurred since this map was published. Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain roads that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

Flood elevations on this map are referenced to either or both the North American Vertical Datum of 1988 (NAVD 88) or National Geodetic Datum of 1929 (NGVD 29), and are labeled accordingly. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. To obtain current elevation, description, and/or location information for bench marks shown on this map, or for information regarding conversion between NGVD 29 and NAVD 88, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

### LEGEND

-  Coastal Barrier Resources System (CBRS) Areas
-  Wetlands Protected Areas (WPA)
-  Letters of Map Revision (LOMR)
-  1% Annual Chance Floodplain Boundary
-  0.2% Annual Chance Floodplain Boundary
-  Floodway Boundary
-  Limit of Study
-  Easement, Culvert, Aqueduct, or Storm Sewer
-  Accredited or Provisionally Accredited Levee, Dike or Floodwall
-  Non-accredited Levee, Dike or Floodwall
-  Hydrographic Feature
-  Profile Baseline
-  1% Annual Chance Cross Section
-  Coastal Traversed
-  North Carolina Geodetic Survey Bench Mark  
(for more information visit <http://www.ngs.noaa.gov/>)
-  National Geodetic Survey Bench Mark  
(for more information visit <http://www.ngs.noaa.gov/>)
-  NGVD 29 2-6 cm Vertical Control Marks at Contracted Establishments (NCEM) Bench Marks  
(for more information visit <http://www.ngs.noaa.gov/>)
-  M 1.5  
Map Mile Marker

### NOTES TO USERS

This is an official FIRMette of a portion of the effective panels listed in the Title Block shown on Page 1. The information represented on this FIRMette was extracted from the effective digital flood hazard data available at [www.floodmaps.nc.gov/fms](http://www.floodmaps.nc.gov/fms).

Base flood elevation data, floodway, nonencroachment widths, information on certain areas in the Special Flood Hazard Areas protected by flood control structures, and other pertinent data are available in the Flood Insurance Study (FIS) available at [www.floodmaps.nc.gov/fms](http://www.floodmaps.nc.gov/fms). Users should be aware that flood elevations shown on this FIRMette represent elevations rounded to one tenth of a foot (0.1') and should be utilized in conjunction with data available in the FIS.

The FIS report also provides instructions for determining a floodway using non-encroachment widths for flooding sources studied by limited detailed methods.

### MORE INFORMATION

|  |   |
|--|---|
| Letters of Map Amendment (LOMA)                        | 1-877-336-2627<br><a href="http://www.fema.gov/">http://www.fema.gov/</a>                 |
| Letters of Map Revision (LOMR)                         | 919-715-5711<br><a href="http://www.ncfloodmaps.com">www.ncfloodmaps.com</a>              |
| Flood Insurance Availability                           |   |
| North Carolina Division of Emergency Management (NCEM) | 919-715-5711<br><a href="http://www.ncdems.com/">http://www.ncdems.com/</a>               |
| National Flood Insurance Program (NFIP)                | 1-877-450-8620<br><a href="http://www.fema.gov/national">http://www.fema.gov/national</a> |
| Questions about this FIRMette                          | 1-877-336-2627<br><a href="http://www.fema.gov/">http://www.fema.gov/</a>                 |

### MAP REVISIONS

There are no map revisions for the selected area.

Advanced

Information

Information

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map template

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latory

Risk

PDF paper size

11

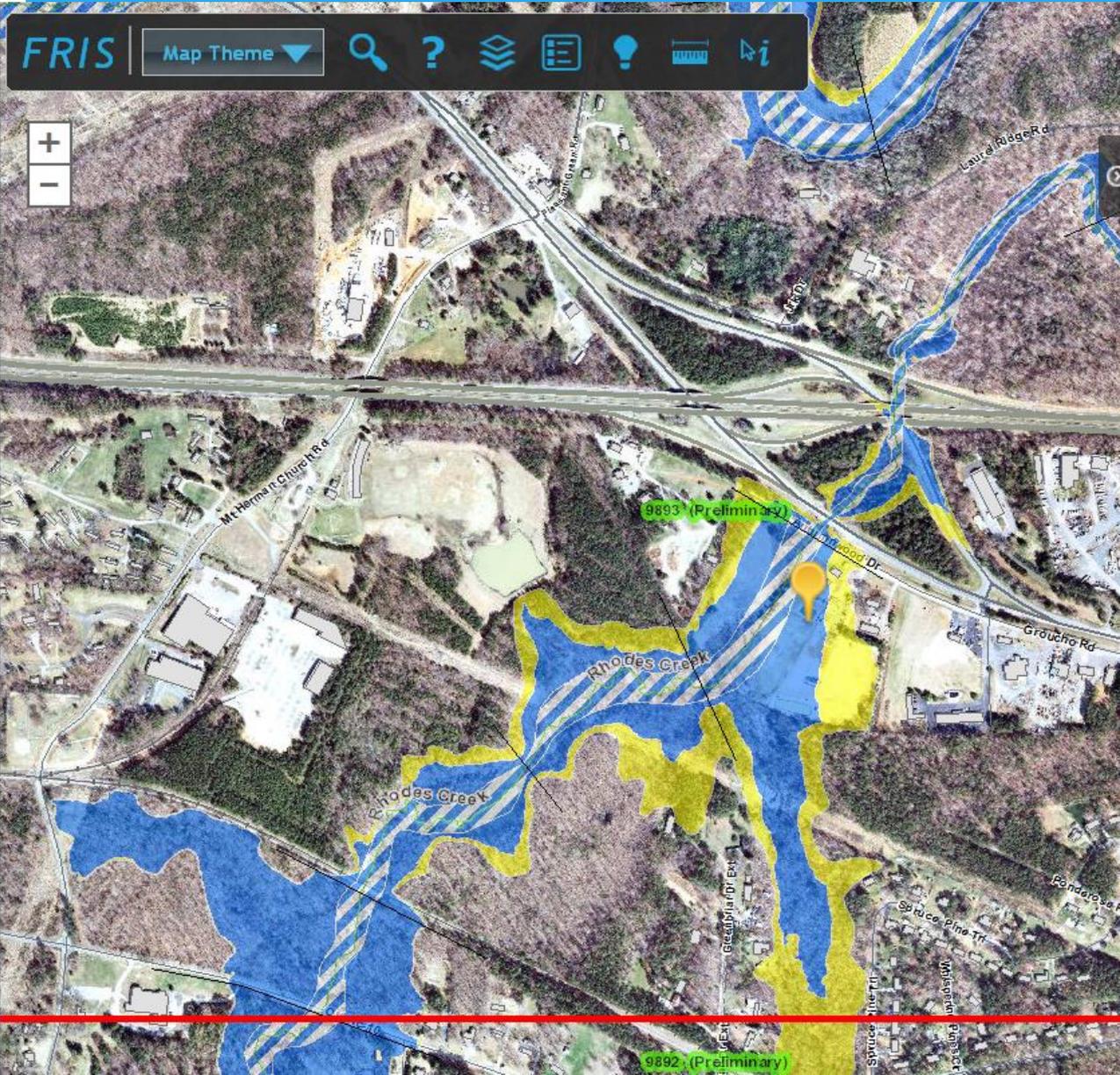
17

it

port



# Base Flood Elevations



Who Am I : General Public ⌵ Preliminary ⌵

## Flood Information

Preliminary Panels are outlined in  ?

! This panel's status is Preliminary.

577 Fayetteville Ave, Siler, NC  
[Google Street View](#)

📍 Map Location

Flood Zone: **AE** ⬆

Flood Source: Flood model not available for this area.

Base Flood Elevation: 557.3 ft ⓘ Less ⬆

50 Year Flood Elevation 556.4 ft ⓘ

25 Year Flood Elevation 556.2 ft ⓘ

10 Year Flood Elevation 555.6 ft ⓘ

County: Chatham

Political Area: Town Of Siler City

CID: 370058

Panel: 8761

Map Number: 3710876101K

Preliminary Issuance Date: 08/30/13

Latitude: 35.71692

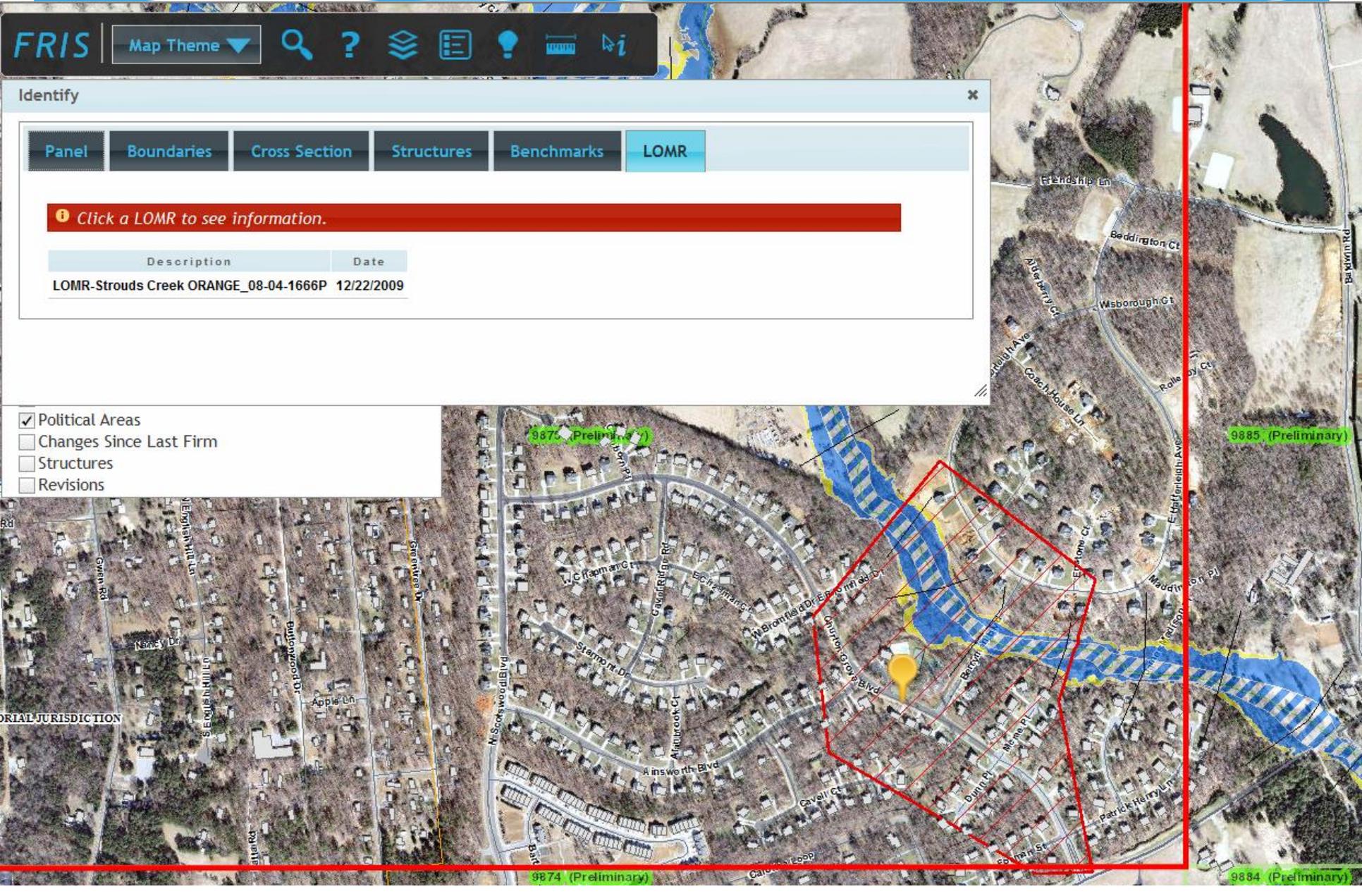
Longitude: -79.45727

➤ Risk Information

➤ Financial Vulnerability

➤ FIS Reports

# FRIS LOMR View



FRIS

Map Theme

Identify

Panel

Boundaries

Cross Section

Structures

Benchmarks

LOMR

Click a LOMR to see information.

| Description                           | Date       |
|---------------------------------------|------------|
| LOMR-Strouds Creek ORANGE_08-04-1666P | 12/22/2009 |

- Political Areas
- Changes Since Last Firm
- Structures
- Revisions

9876 (Preliminary)

9885 (Preliminary)

9874 (Preliminary)

9884 (Preliminary)

# Reviewing the Data

**FRIS** | Map Theme | Search | Help | Layers | Legend | Settings | Print | Full Screen

**Map Contents**

- Flood Zones
- Cross Sections
- DFIRM Panels
- Model Extents
- LOMR
- Building Footprints without Risk
- Building Footprints with Risk
- Flood Depth
- Flood Probability
- Flood Vulnerability
- Benchmarks
- Base Map
- Damage Hotspots
- Political Areas
- Changes Since Last Firm
- Structures
- Revisions

**Who Am I: General Public** | **Preliminary**

**Flood Information**

Preliminary Panels are outlined in  ?

**This panel's status is Preliminary.**

**155 S Estes Dr, Chapel Hill, NC**  
[Google Street View](#)

**Map Location**

**Flood Zone:** AE

**Flood Source:** Bolin Creek

**Base Flood Elevation:** 263.5 ft [More](#)

**County:** Orange

**Political Area:** Town Of Chapel Hill

**CID:** 370180

**Panel:** 9799

**Map Number:** 3710979901L

**Preliminary Issuance Date:** 08/30/13

**Latitude:** 35.92793

**Longitude:** -79.02846

[Risk Information](#)

[Financial Vulnerability](#)

[FIS Reports](#)

[Map Export](#)

[Data Export](#)

Download Digital Flood Hazard Data  
from the State's FTP site  
for posting to the Local GIS website:

[ftp://ftp1.ncem.org/Preliminary\\_Information/](ftp://ftp1.ncem.org/Preliminary_Information/)

User Name: FMPGIS

Password: GIS4U

# ADDITIONAL RESOURCES

- ◎ NC Office of Geospatial and Technology Management – Floodplain Mapping Program
  - \* Steve Garrett, CFM, Community Development Planner/LOMC Manager  
919-825-2316 [steve.garrett@ncdps.gov](mailto:steve.garrett@ncdps.gov)
  - \* Hope Morgan, GIS Manager 919-825-2336 [hope.morgan@ncdps.gov](mailto:hope.morgan@ncdps.gov)
  - \* Kurt Golembesky, PE, CFM, Engineer 919-825-2318  
[kurt.golembesky@ncdps.gov](mailto:kurt.golembesky@ncdps.gov)
  - \* Heather V. Keefer, CFM, NFIP Planner 919-825-2289  
[heather.keeper@ncdps.gov](mailto:heather.keeper@ncdps.gov)
- ◎ Federal Emergency Management Agency
  - \* 1-877-FEMA-MAP
  - \* [www.fema.gov](http://www.fema.gov)

# Fact Sheets and Forms Links

- \* Panel Checklist:

- \* [http://www.ncfloodmaps.com/pubdocs/panel\\_checklist\\_jun07.pdf](http://www.ncfloodmaps.com/pubdocs/panel_checklist_jun07.pdf)

- \* Appeals Fact Sheet and Petition Form:

- \* [http://www.ncfloodmaps.com/pubdocs/appeals\\_protests\\_fact\\_sheet\\_06-10.pdf](http://www.ncfloodmaps.com/pubdocs/appeals_protests_fact_sheet_06-10.pdf)

- \* [http://www.ncfloodmaps.com/pubdocs/appeal\\_petition.pdf](http://www.ncfloodmaps.com/pubdocs/appeal_petition.pdf)

- \* Limited Detailed Study Fact Sheet:

- \* [http://www.ncfloodmaps.com/pubdocs/limited\\_detailed.pdf](http://www.ncfloodmaps.com/pubdocs/limited_detailed.pdf)

# IMPORTANT DATES

## ⦿ Appeal Period:

- \* TBD; anticipated in Winter

## ⦿ NFIP Training Opportunities:

- \* July 20, 2016: Basic CRS Training, Statesville, NC
- \* July 26 & 27, 2016: Advanced CRS Training, Raleigh, NC
- \* August 3 & 4, 2016 : Western NC Summer NFIP Workshop, Boone, NC
- \* August 10 & 11, 2016: Advanced CRS Training, Wilmington, NC
- \* August 17 & 18, 2016: Central NC Summer NFIP Workshop, Yadkinville, NC
- \* August 24 & 25, 2016: Advanced CRS Training, Williamston, NC
- \* September 28 & 29, 2016 : Eastern NC Summer NFIP Workshop, Morehead City, NC
- \* September 2014: Managing Floodplain Development through the NFIP, Details Pending

# QUESTIONS?

