FEMA

Westchester County, NY Coastal Hazard Analysis Flood Risk Review Meeting

August 20, 2014

RiskMAP
Increasing Resilience Together

Agenda for Today

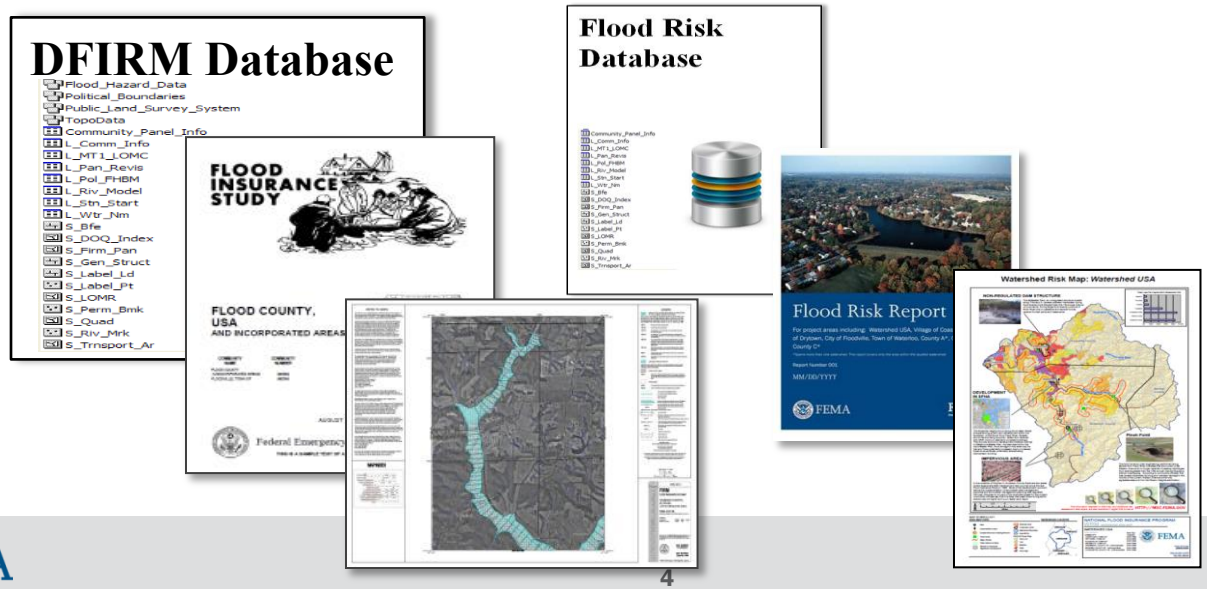
- **Risk MAP Program Overview**
- **Hazard Mitigation Planning Process and Mitigation Actions**
- **Overview of Non-Regulatory Flood Risk Products and Datasets**
- **Coastal Flood Risk Study and Mapping**
- **Flood Risk Communications**
- **USACE and USGS**
- **Breakout Group Sessions**

FEMA's Risk MAP Program

- **Risk Mapping, Assessment and Planning 2010 - 2014**
- **Builds on Map Mod digitized Flood Insurance Rate Map (FIRM) successes**
- **Will deliver quality data that increase public awareness and lead to action that reduces risk to life and property**
- **Regulatory Products: Flood Insurance Study (FIS) and FIRM (Coastal re-mapping)**
- **New Non-Regulatory Products and Datasets**

Why We're Doing This: Hazard Mitigation

- **Hazard Mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to life and property from hazards**
- **Use new Risk MAP information to help with identifying mitigation actions when updating your Hazard Mitigation Plan**



Local Hazard Mitigation Plans (HMPs)

Risk MAP

Risk MAP Products and Datasets

Hazard Mitigation Plan

- Uses risk information
- Identifies projects/actions
- Integrates with other community plans

Other Community Plans

- Comprehensive plans
- Capital Improvement
- Stormwater Management Plans
- Emergency Operations
- Sustainability / Climate Change Plan

Mitigation Actions/Projects

Mitigation Actions – Types and Examples

STRUCTURE AND INFRASTRUCTURE PROJECTS

Acquisition

Elevation

Retrofits

Drainage

LOCAL PLAN AND REGULATIONS

Zoning

Building Codes

Ordinances

Open Space Plan

COMMUNITY IDENTIFIED PROGRAMS

Firewise

StormReady

NFIP

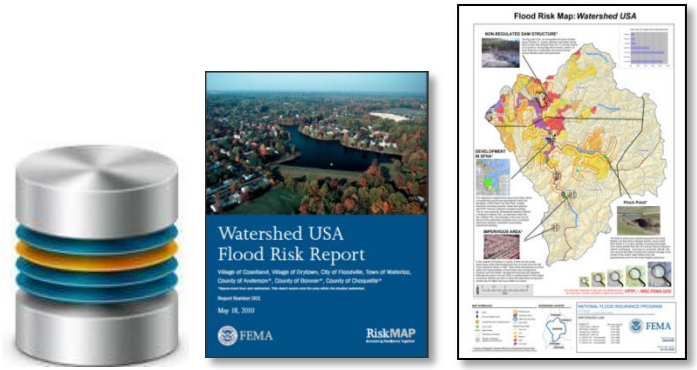
CRS

NATURAL SYSTEM PROTECTION

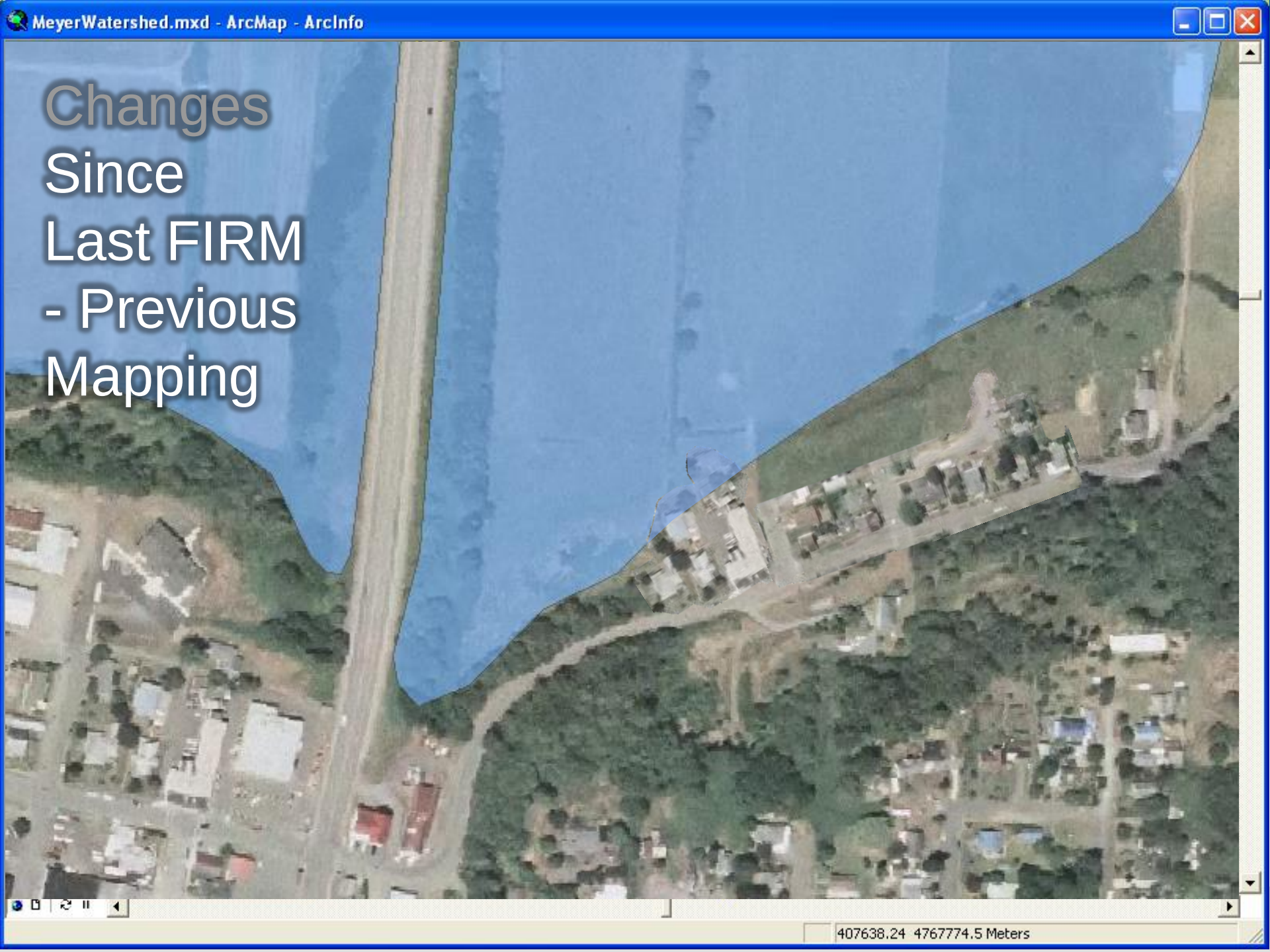
Stream and wetland restoration

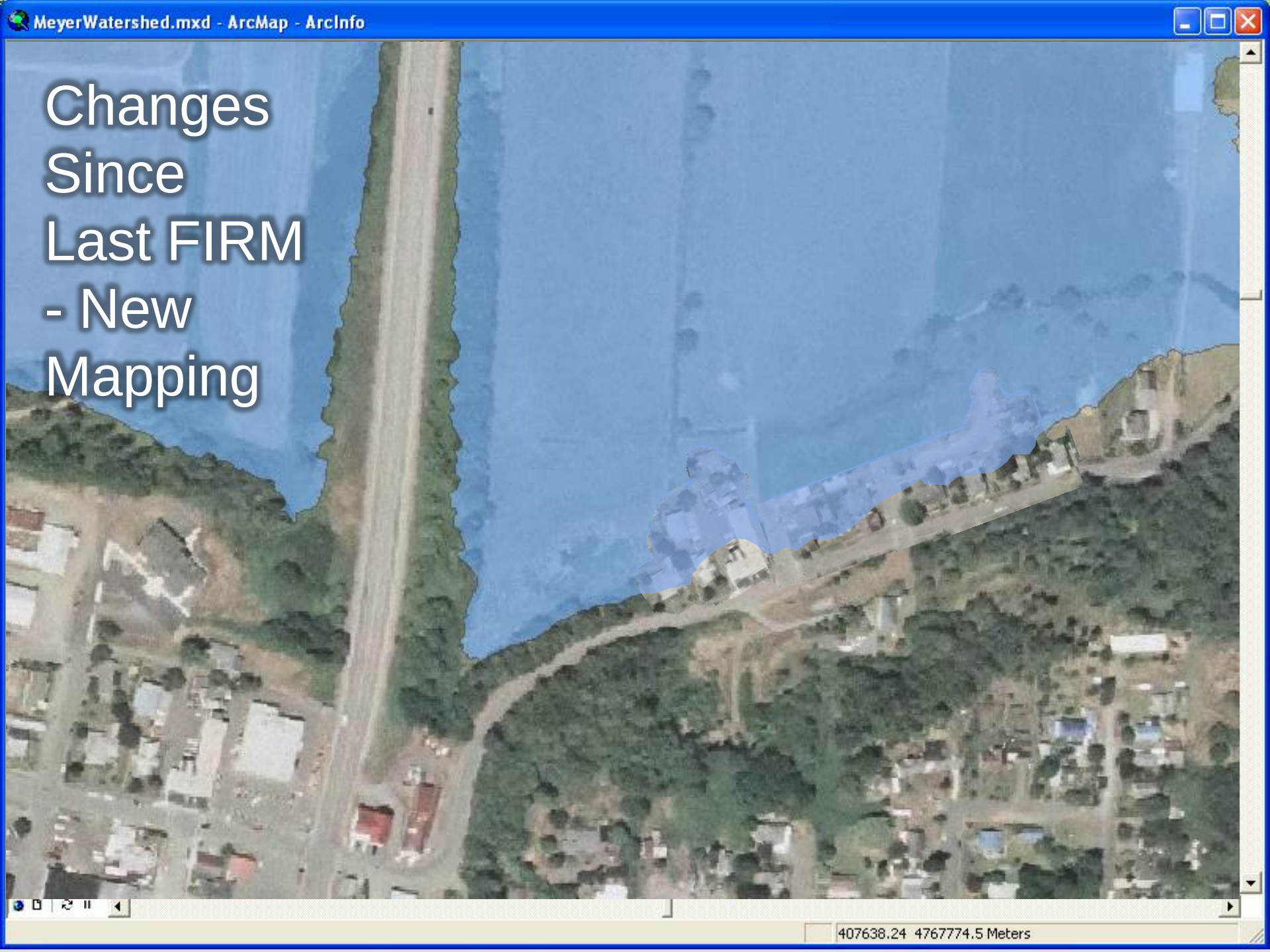
Erosion control

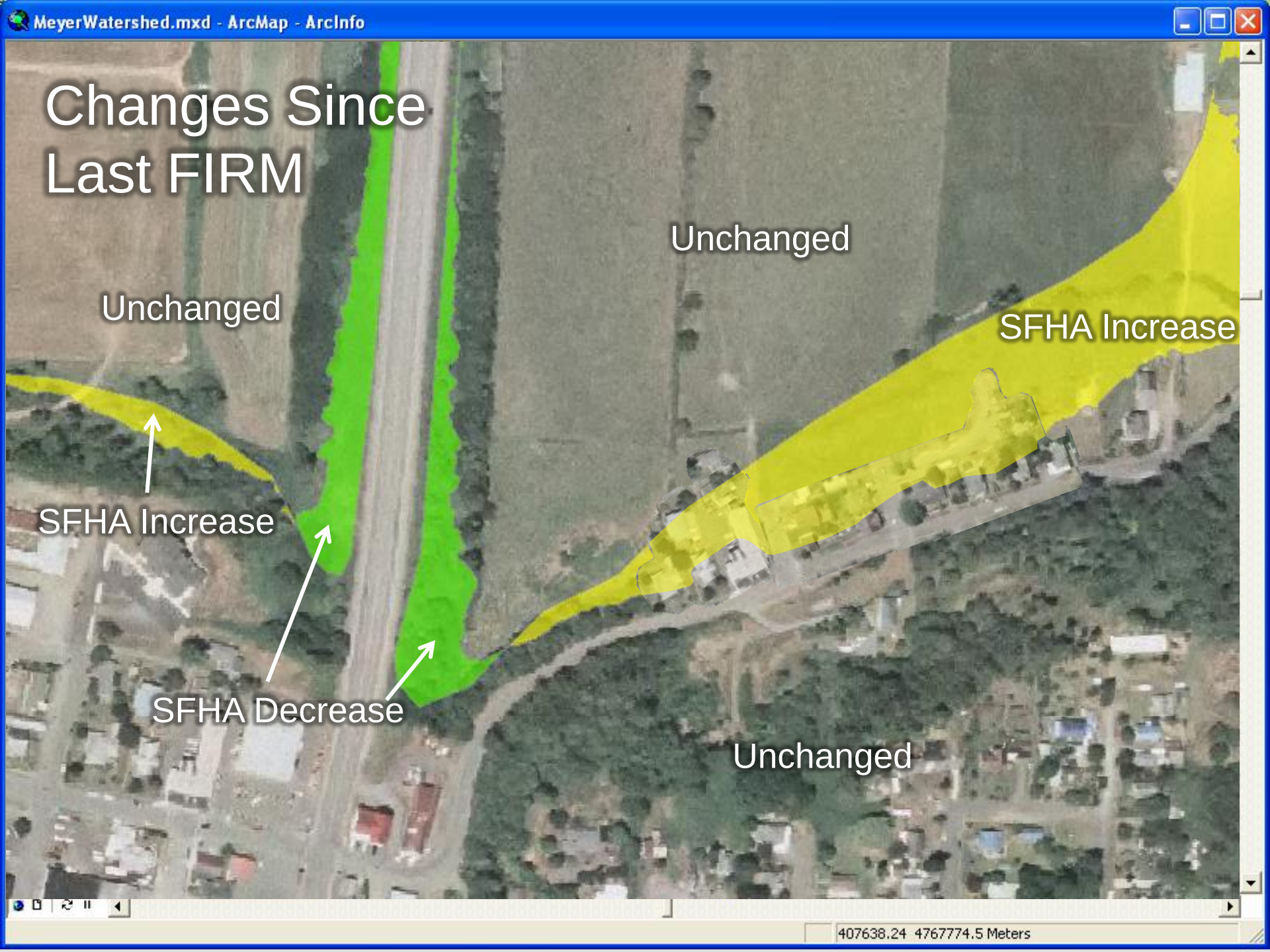
Non-Regulatory Coastal Flood Risk Products and Datasets

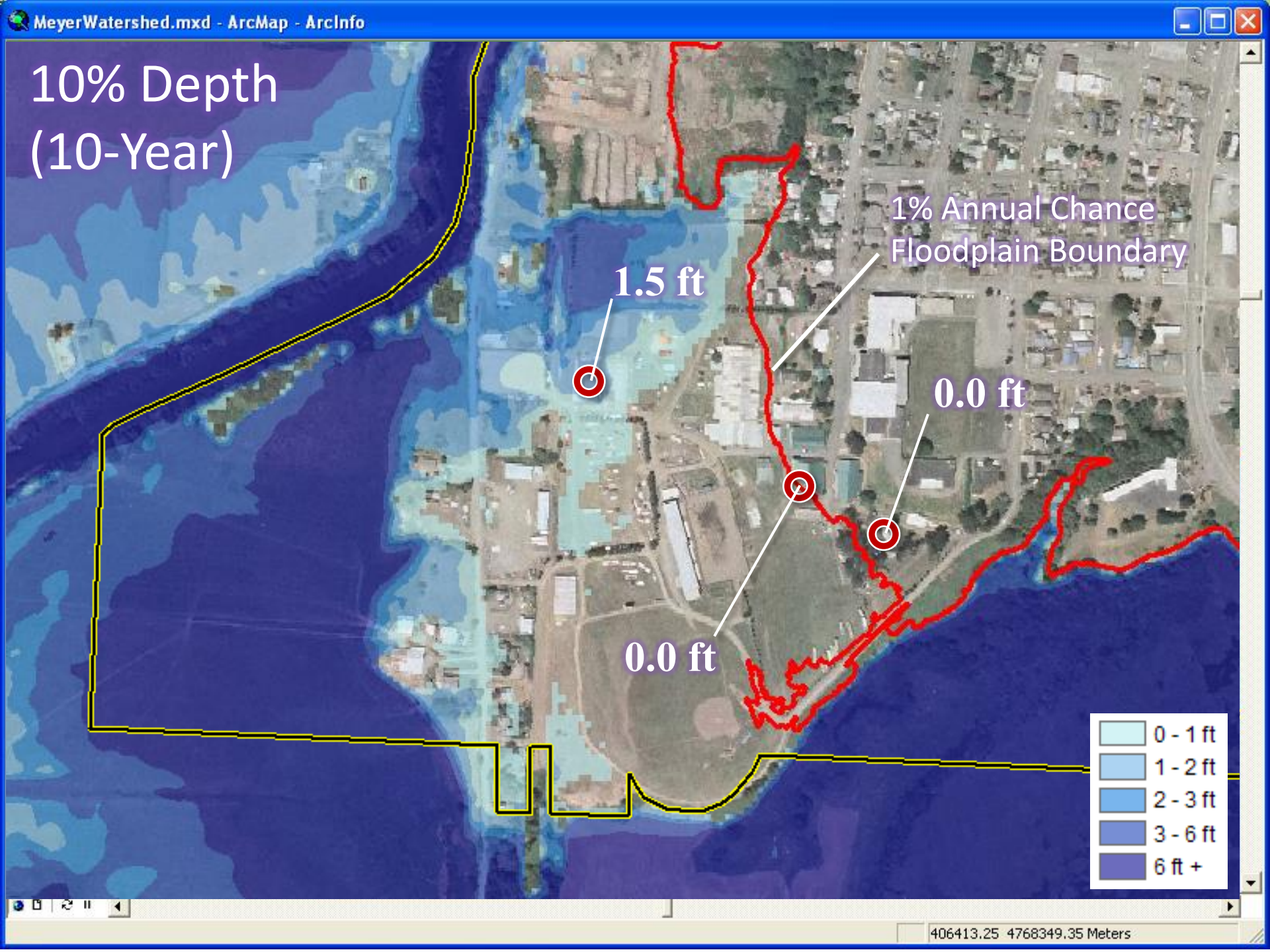


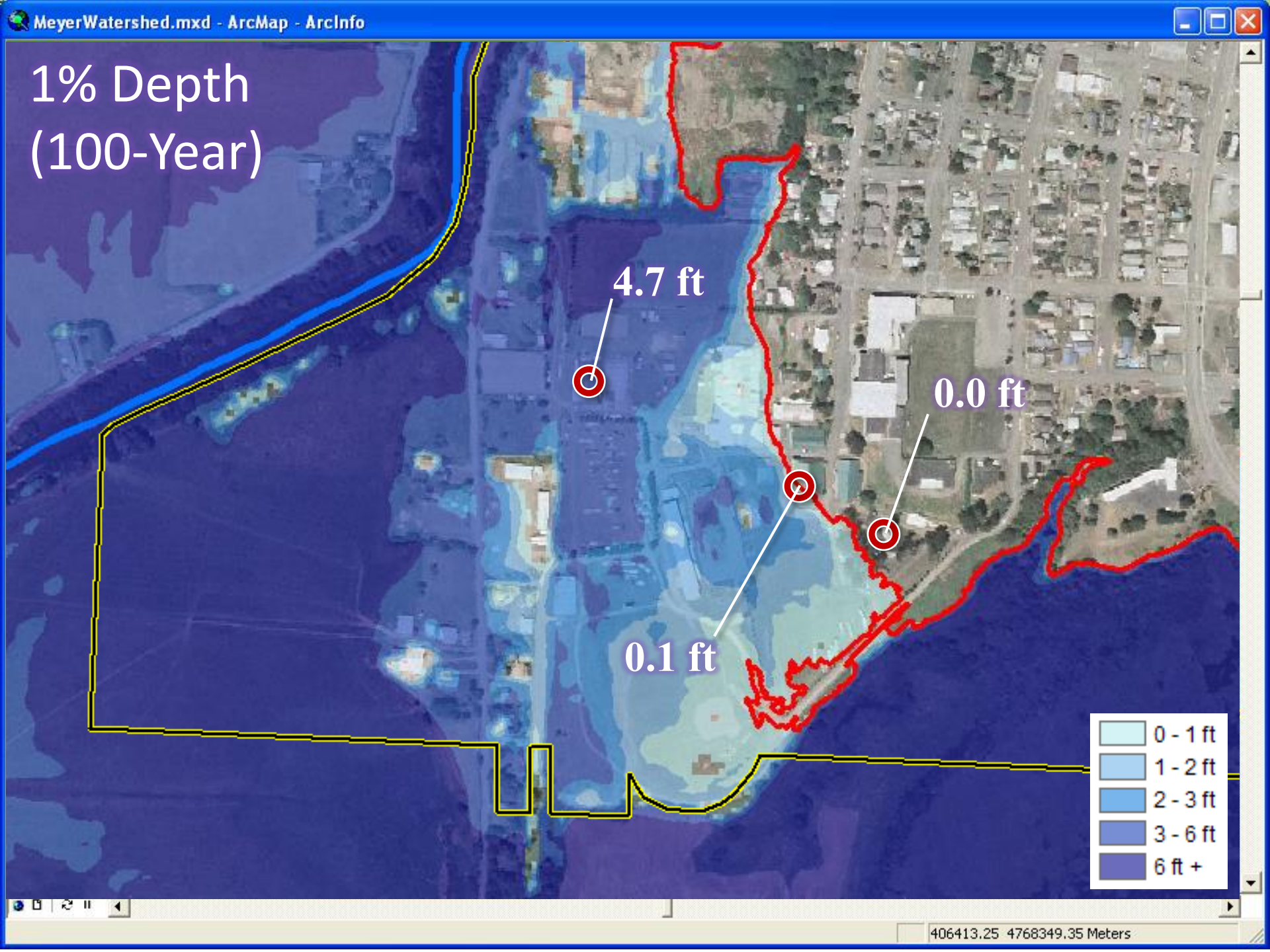
- **Flood Risk Products**
  - Flood Risk Report, Map, and Database
- **Flood Risk Datasets**
  - Changes Since Last FIRM (CSLF)
  - Coastal 1% Depth Grid
  - Areas of Mitigation Interest (AOMI)
  - Flood Risk Assessment (refined Hazus analysis)

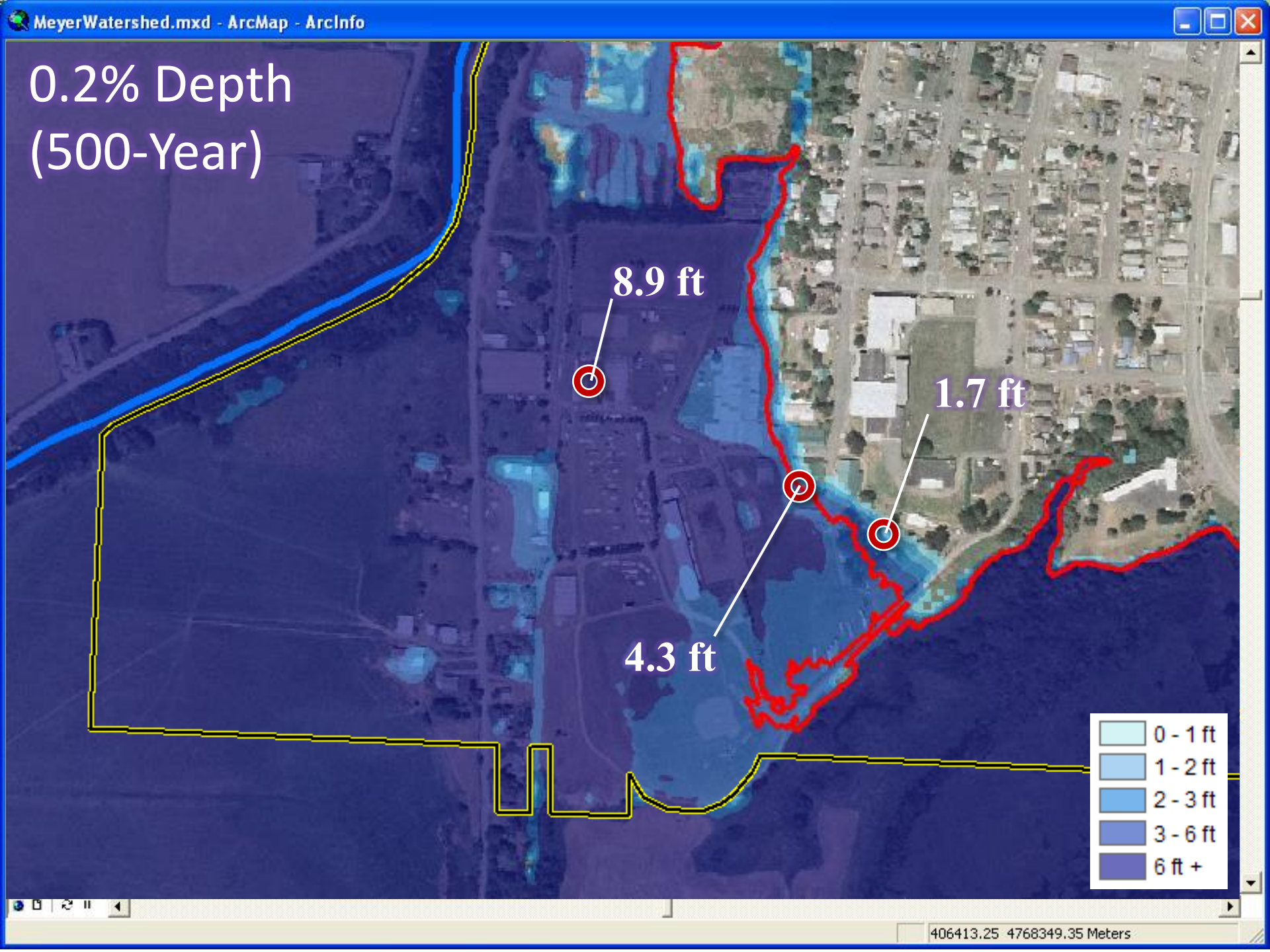

MeyerWatershed.mxd - ArcMap - ArcInfo
Changes
Since
Last FIRM
- Previous
Mapping
407638.24 4767774.5 Meters


MeyerWatershed.mxd - ArcMap - ArcInfo
Changes Since Last FIRM - New Mapping
407638.24 4767774.5 Meters


MeyerWatershed.mxd - ArcMap - ArcInfo
Changes Since Last FIRM
Unchanged
Unchanged
SFHA Increase
SFHA Increase
SFHA Decrease
Unchanged
407638.24 4767774.5 Meters


MeyerWatershed.mxd - ArcMap - ArcInfo
10% Depth
(10-Year)
1% Annual Chance
Floodplain Boundary
1.5 ft
0.0 ft
0.0 ft
0 - 1 ft
1 - 2 ft
2 - 3 ft
3 - 6 ft
6 ft +
406413.25 4768349.35 Meters


MeyerWatershed.mxd - ArcMap - ArcInfo
1% Depth
(100-Year)
4.7 ft
0.0 ft
0.1 ft
0 - 1 ft
1 - 2 ft
2 - 3 ft
3 - 6 ft
6 ft +
406413.25 4768349.35 Meters

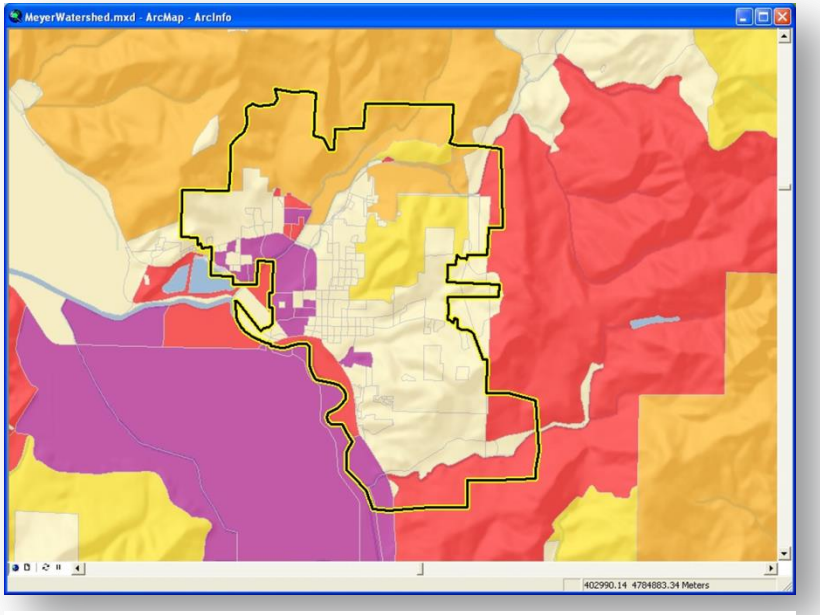

MeyerWatershed.mxd - ArcMap - ArcInfo
0.2% Depth
(500-Year)
8.9 ft
1.7 ft
4.3 ft
0 - 1 ft
1 - 2 ft
2 - 3 ft
3 - 6 ft
6 ft +
406413.25 4768349.35 Meters

Using Flood Risk Assessment for Identifying Actions

Flood Risk Assessment

- **Identifies areas of higher flood risk by Census blocks**
- **Quantifies potential future flood losses to existing structures**
- **Improves ability to identify areas requiring higher building code requirements**
- **Supports mitigation plan updates and disaster recovery planning through improved risk quantification**

1% Annual Chance Risk

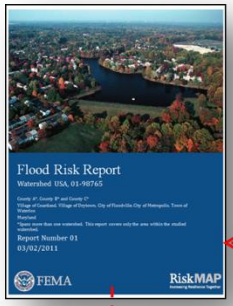


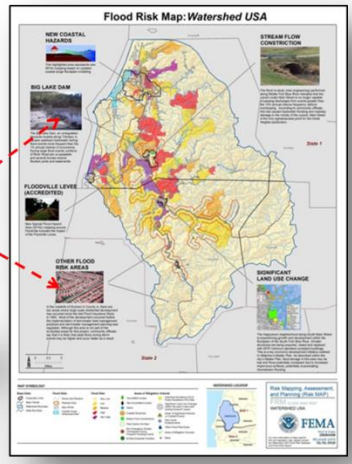
Census 2000 Data

Using Areas of Mitigation Interest for Identifying Actions

Areas of Mitigation Interest

- **Identifies areas at risk of flooding and contributing factors**
- **Assists in prioritizing areas of greatest mitigation needs**
- **Identifies potential need for infrastructure upgrades and other community investments (e.g., undersized culverts)**

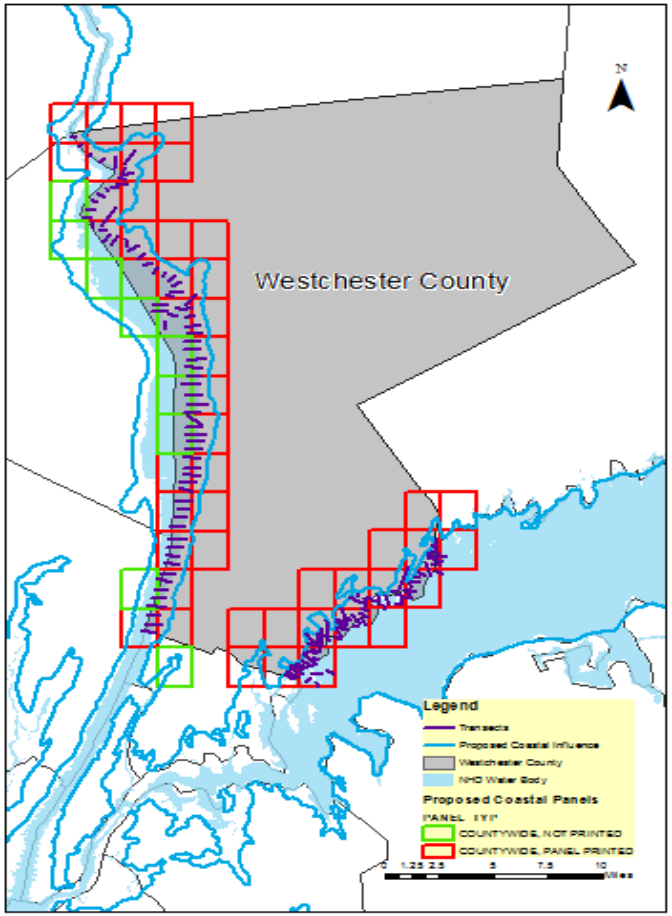




Type of Mitigation Interest	Number of Areas	Data Source
Dam	1	State CTP
Levee	2	State CTP
Stream Flow Pinch Points	2	Local Pub Works, engineering models
Significant Land Use Changes	1	Local Planning Div
Past Claims Hot Spot	1	State NFIP
Area of Mitigation Success	2	State SHMO

Study Area

- **Westchester County**
  - **24 Communities:** *City of Mount Vernon, City of New Rochelle, City of Peekskill, City of Rye, City of Yonkers, Town of Cortlandt, Town Of Mamaroneck, Town of Mount Pleasant, Town of New Castle, Town of Ossining, Village of Briarcliff Manor, Village of Buchanan, Village of Croton-On-Hudson, Village of Dobbs Ferry, Village of Hastings-On-Hudson, Village of Irvington, Village of Larchmont, Village of Mamaroneck, Village of Ossining, Village of Pelham, Village of Pelham Manor, Village of Port Chester, Village of Sleepy Hollow, Village of Tarrytown*
  - **70 miles of shoreline (Long Island Sound and Hudson River)**
  - **Coastal Storm Flooding update**
  - **48 FIRM panels are being updated**
  - **New 2012 LiDAR – NOAA/NYS DEC**



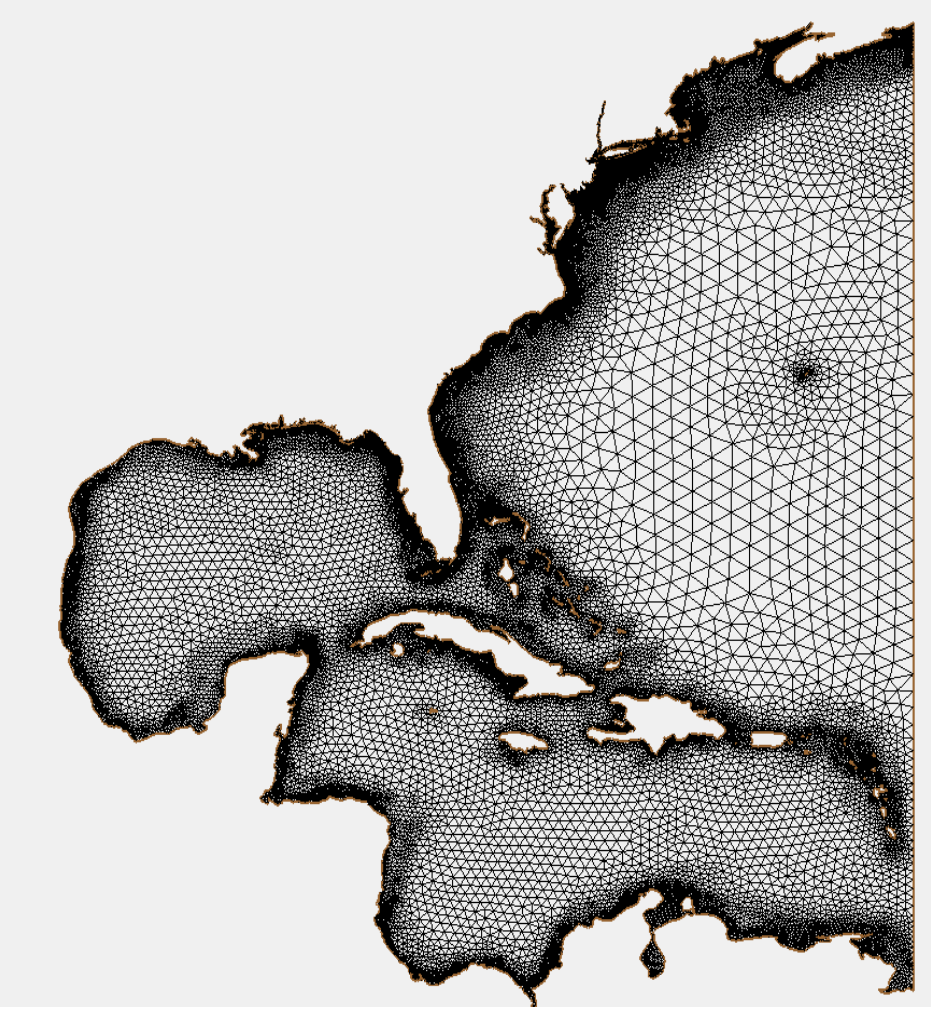
Effective vs. New Coastal Study

Coastal Study Component	Effective Study (2007)	New Study (2013)
Topographic data	2004 contours	2012 LiDAR
SWELs	1970's	2012 FEMA study
Modeled transects	26	343
Wave setup	No*	Yes
Wave runup	No*	Yes
LiMWA	No	Yes

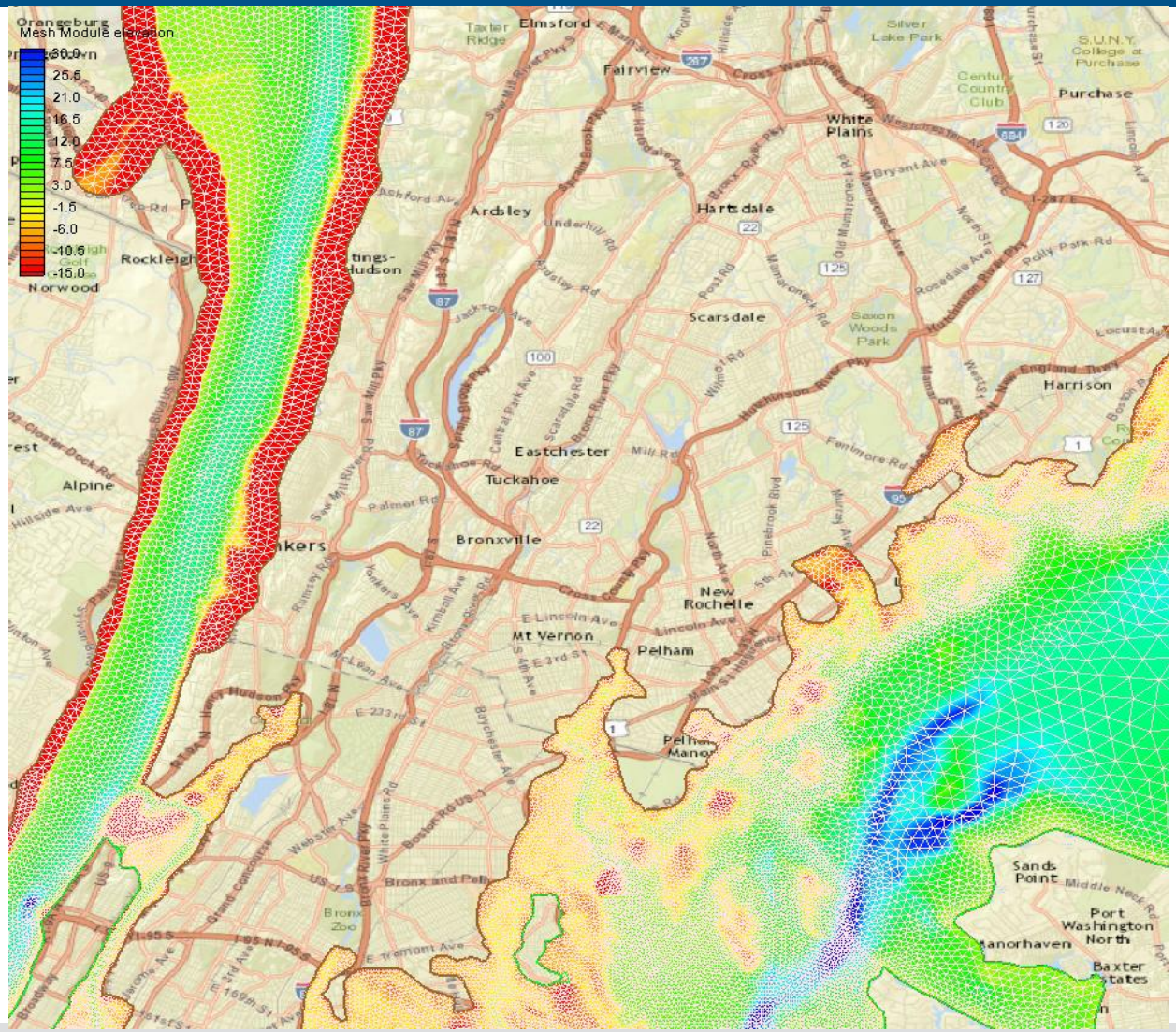
* Recent LOMRs may have included wave setup and wave runup analysis

Storm Surge Stillwater

- **Effective Coastal**
  - Tidal Gage Analysis
    - Hudson River Elevation-Frequency Profiles – USACE
    - Long Island Sound Tidal Frequency Elevation - USACE
      - Willets Point
      - Stamford
- **Updated Coastal**
  - Storm Surge Modeling
    - ADCIRC/SWAN Simulations
    - Hurricanes & Nor'easters

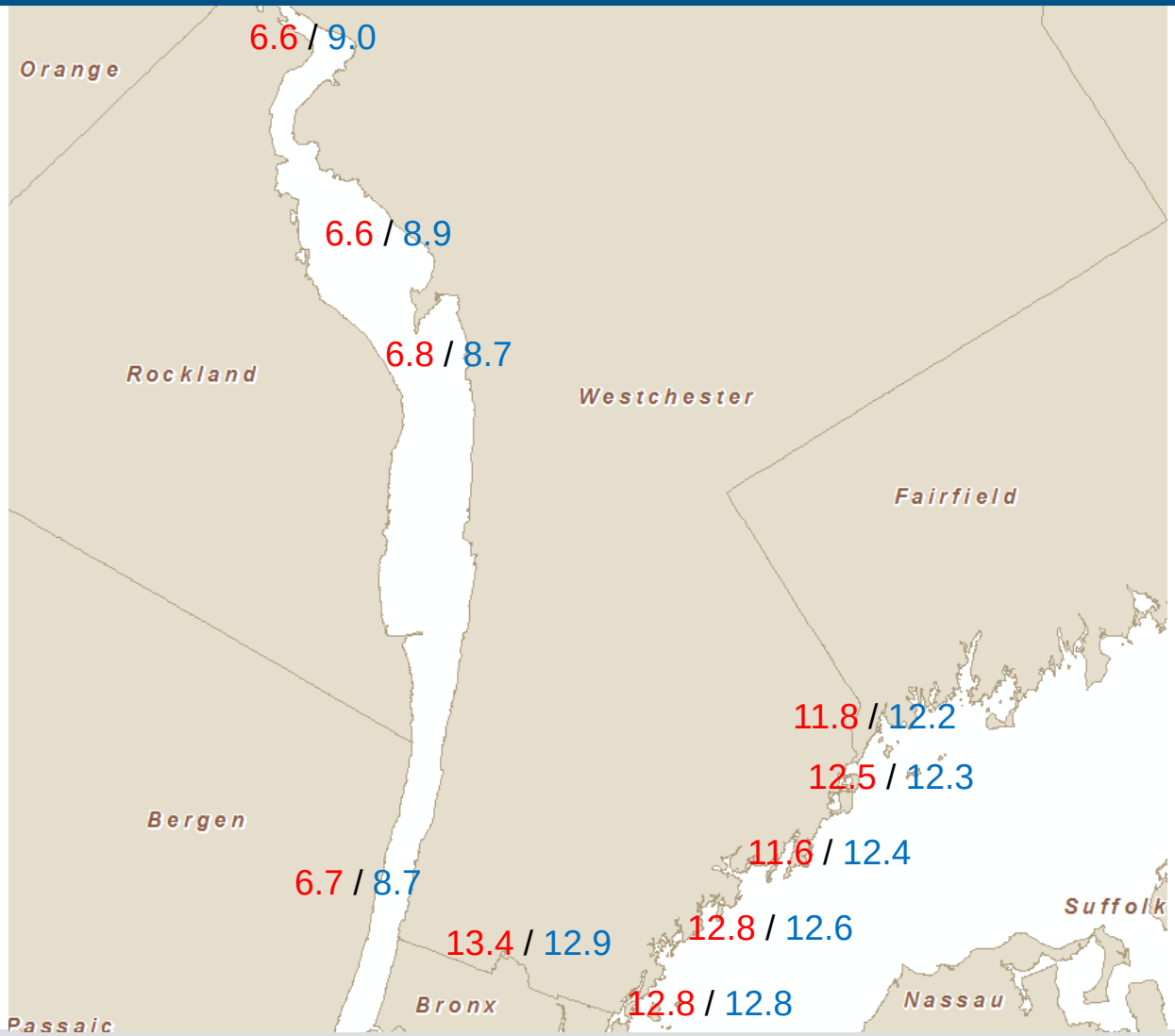


New Storm Surge Model



Storm Surge Stillwater

- **Old / New**
- **Feet NAVD88**

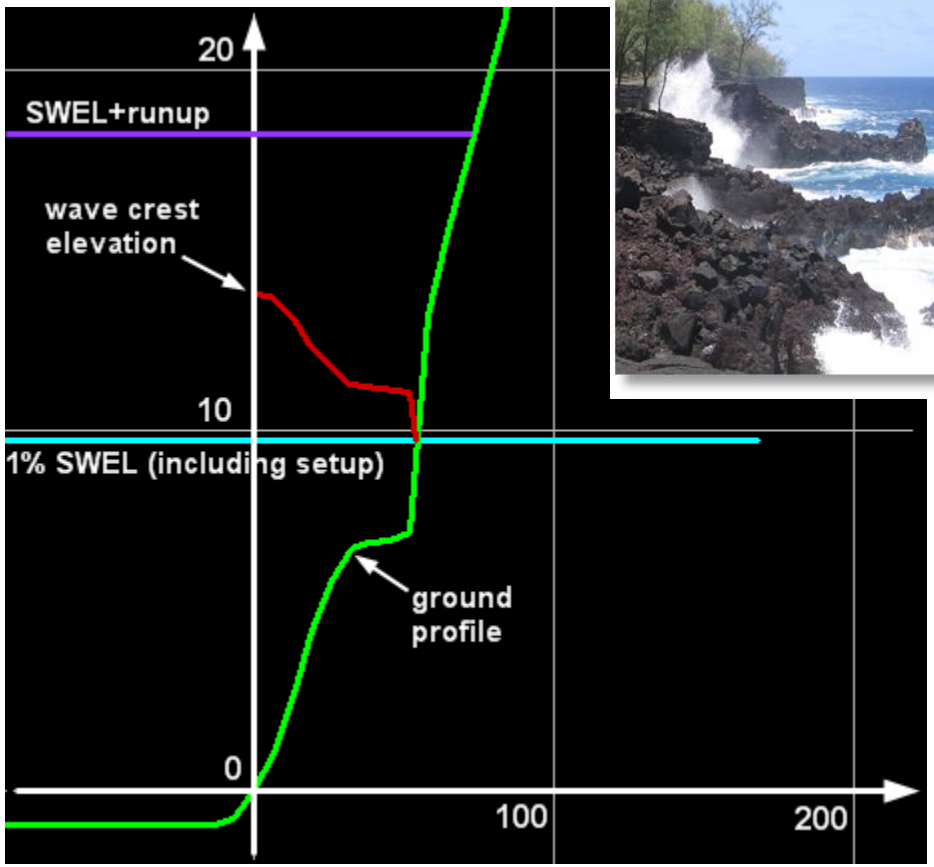


Coastal Hazard Analyses Components

- Transect layout
- Field Reconnaissance (land use, obstructions, shoreline conditions, structures)
- Starting wave conditions (wave height and period) from 2D wave modeling eliminating the need for limited fetch analysis
- Wave setup from 2D wave modeling
- Primary Frontal Dune (PFD)*
- Bluffs erosion*
- WHAFIS modeling for overland wave height computation
- 2% Wave Runup

*Erosion and PFD to not applicable in Westchester County

Wave Runup

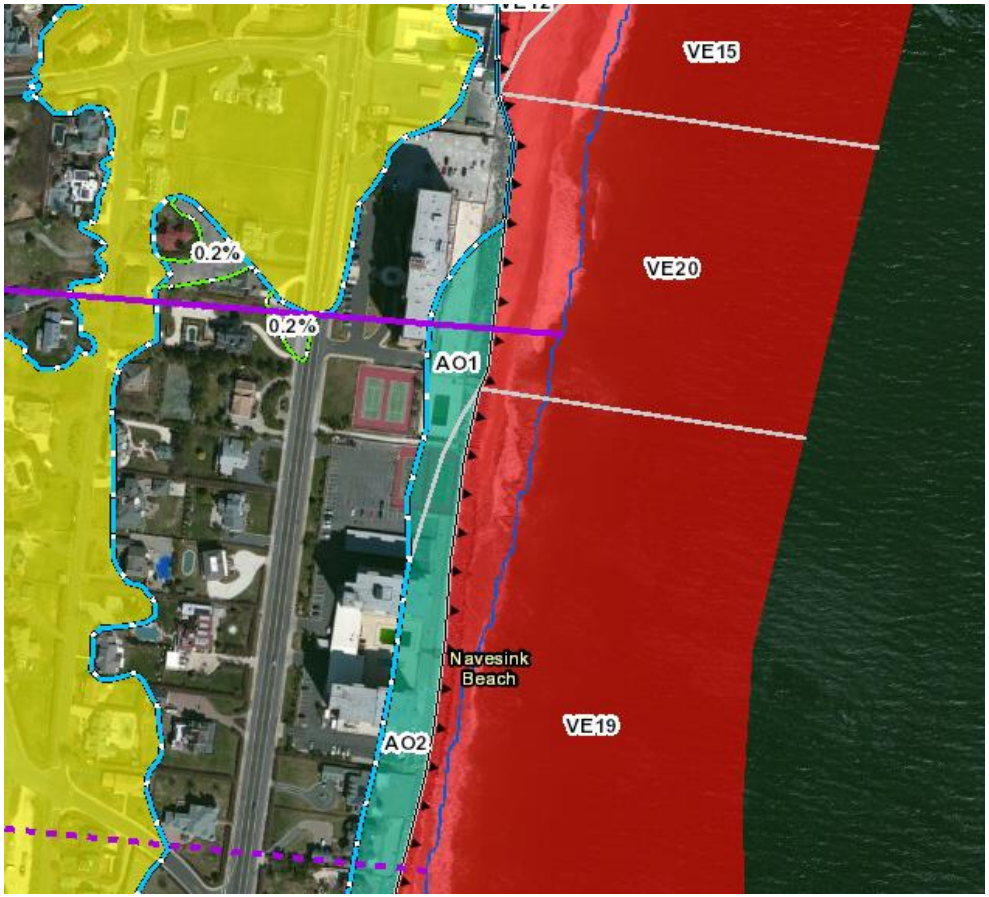


- **Runup modeled for beaches, bluffs, cliffs and coastal structures**
- **Calculate top 2% of runup elevations**
- **Methods:**

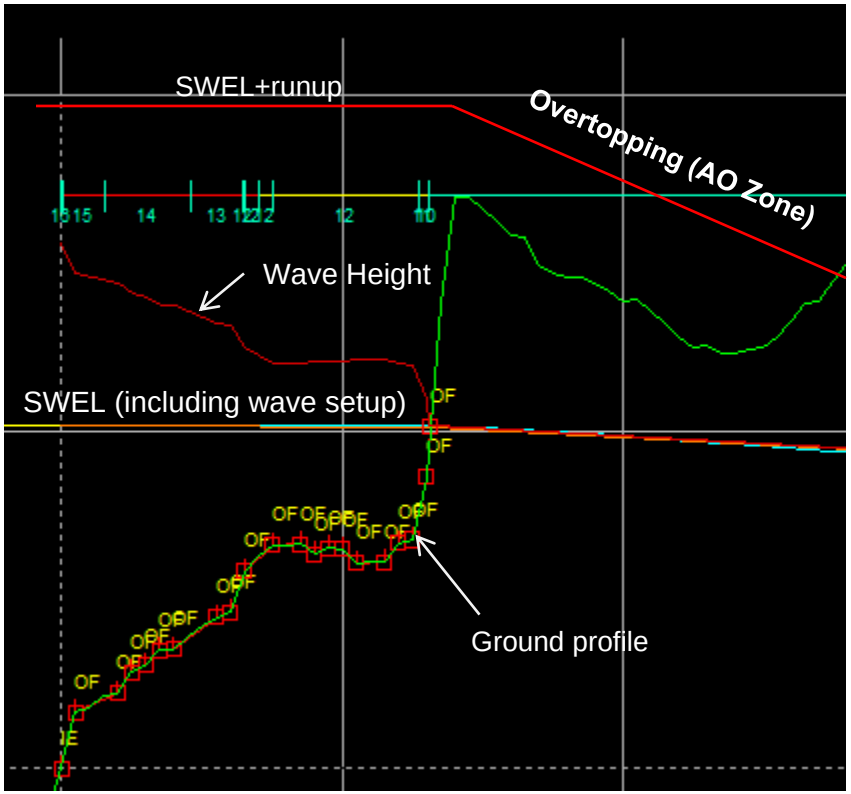
TAW, CSHORE, SPM Vertical

Wave Runup

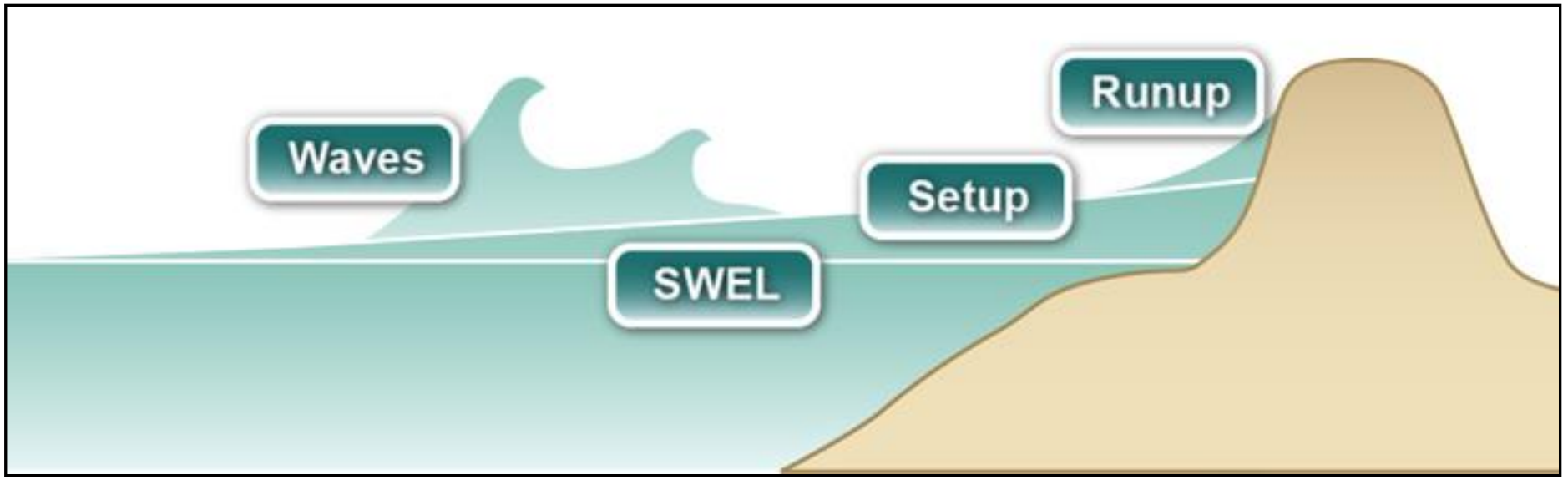
How is runup mapped?



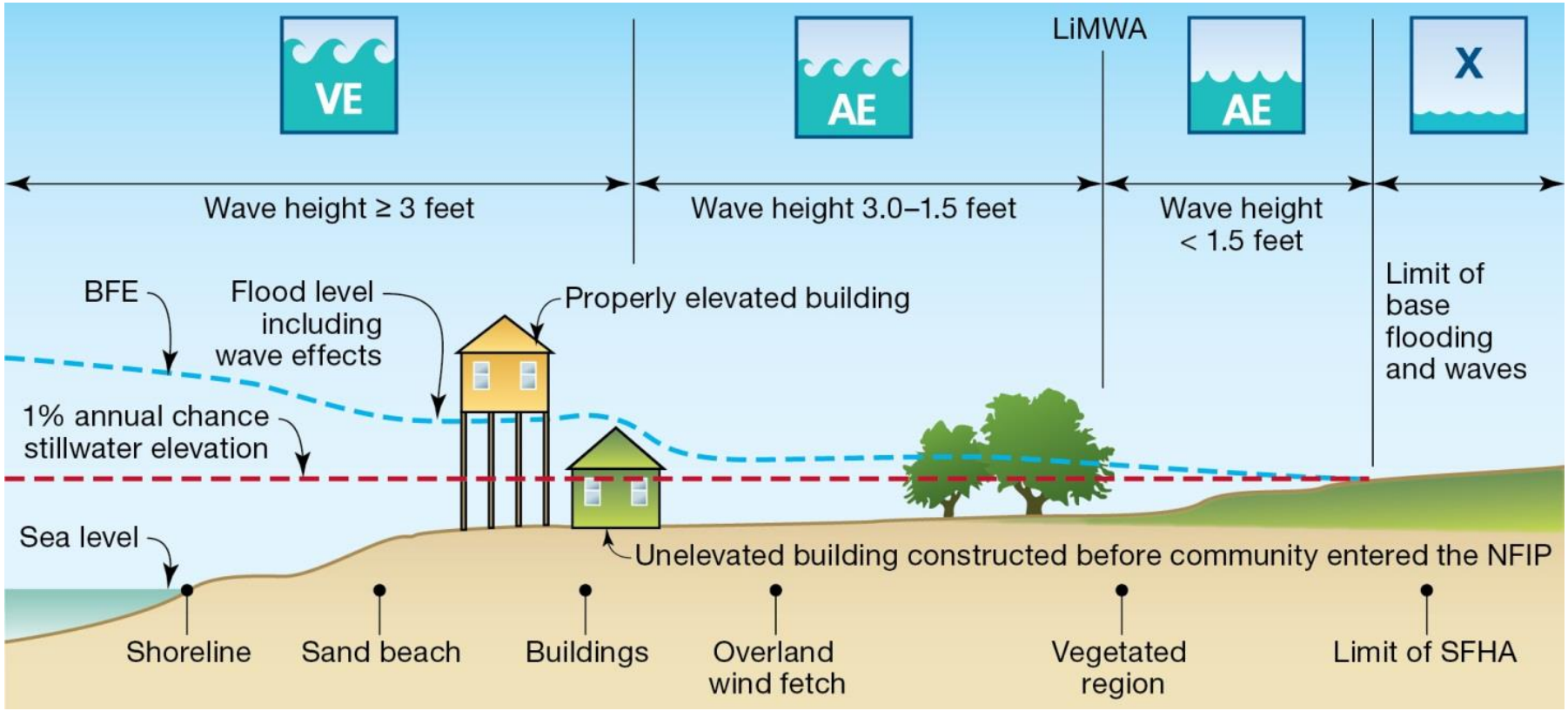
Profile view of Transect



Coastal Base Flood Elevation



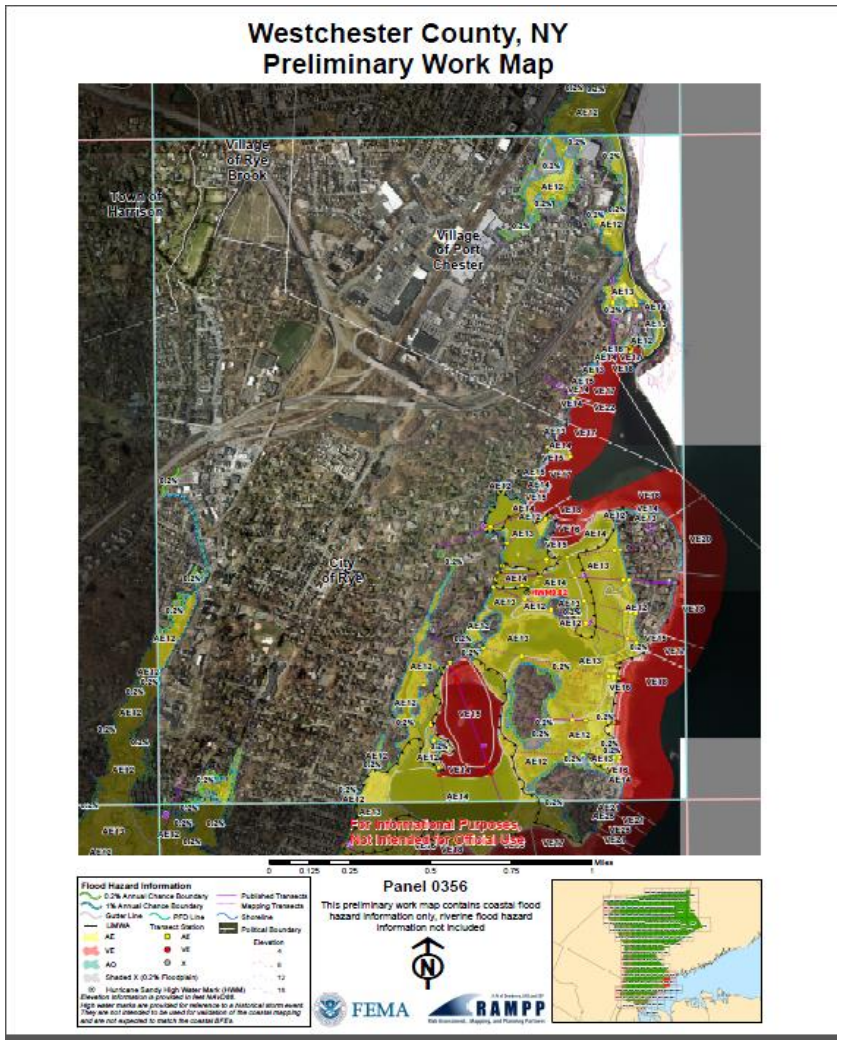
Detailed Coastal Mapping

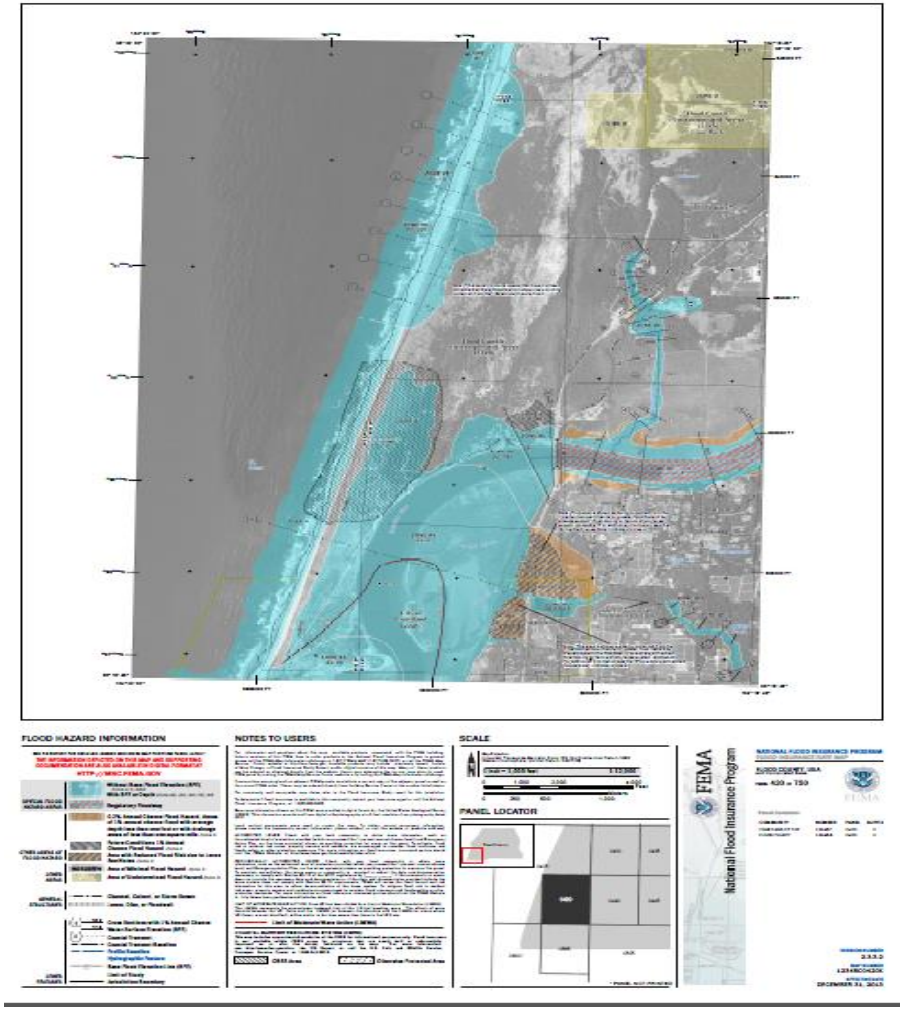


LiMWA on the Map

- **LiMWA sits inside of a Zone AE**
- **Triangles point to higher waves**
  - Indicates where wave height exceeds 1.5ft
- **Also referred to as Coastal A Zone**

Preliminary Work Map vs. Preliminary FIS/FIRM





Risk Communications

- **Federal/State/Local goals:**
  - Creating safer communities reducing risk to lives and property
  - Effectively communicate risk and increase public awareness, leading citizens to make informed decisions regarding risk

- **Key factors contributing to successful achievement of these goals are:**
  - Community engagement and exchange of flood risk information
  - Effective collaboration through partnerships
  - Strategic communications plan development

Risk Awareness

KNOW YOUR RISK

Do your residents know about their flood risk?

KNOW YOUR ROLE

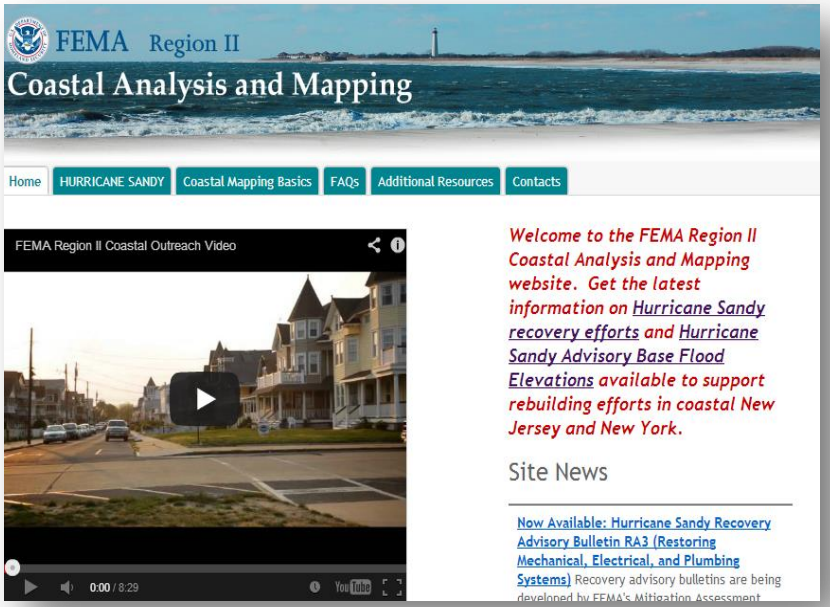
Do your residents know what mitigation actions they should/can take?

TAKE ACTION

Encourage your residents to take the actions that can build their resiliency to flooding.

Risk Communications - Resources

- Visit our Website: www.region2coastal.com
- Outreach factsheets
- Frequently Asked Questions
- Coastal Risk Educational Videos



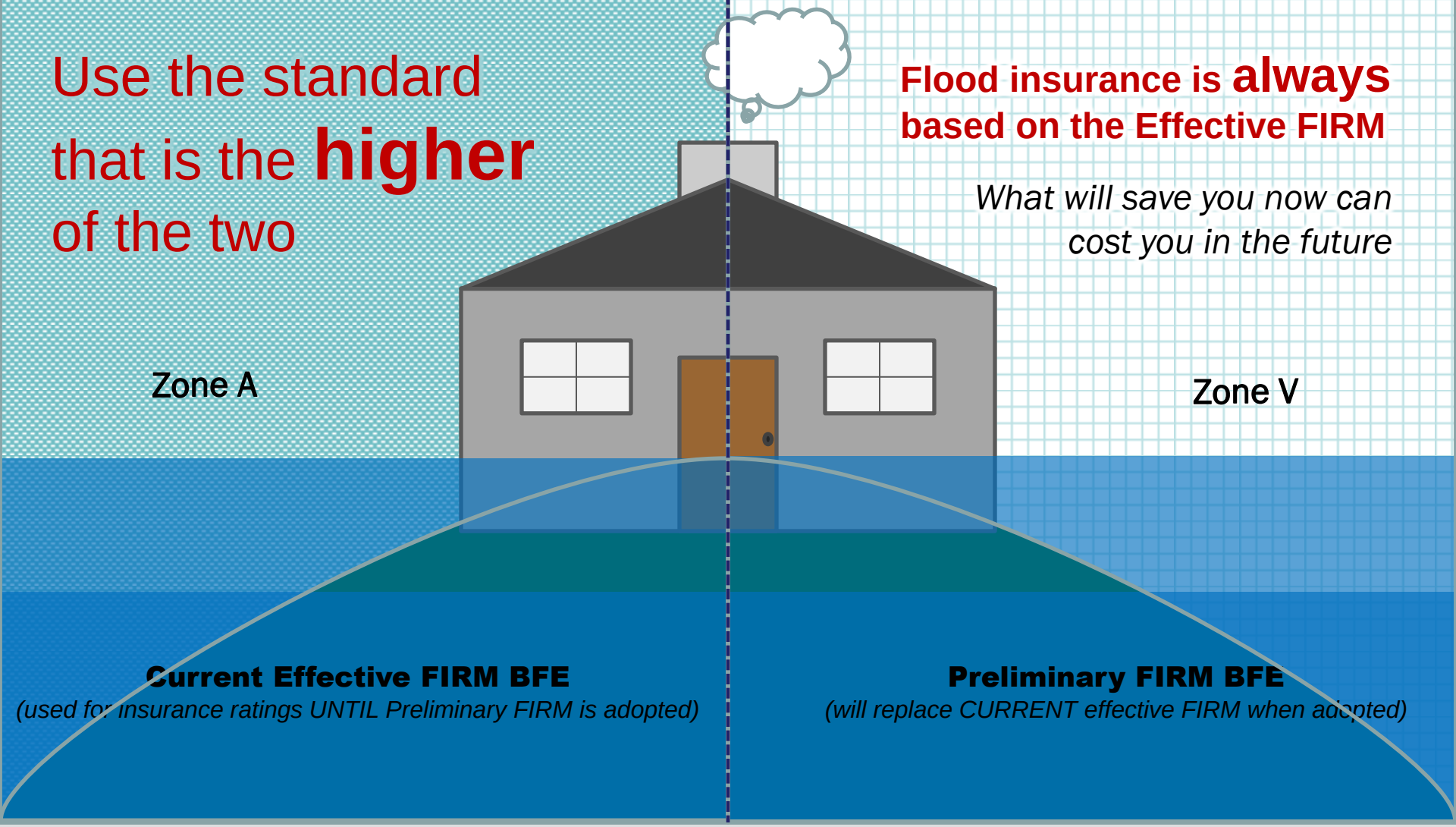
- Best Available Data (Preliminary Work Maps)
- Non-Regulatory Products and Datasets

Using Effective and Preliminary FIRM Data

Use the standard that is the **higher** of the two

Flood insurance is always based on the Effective FIRM

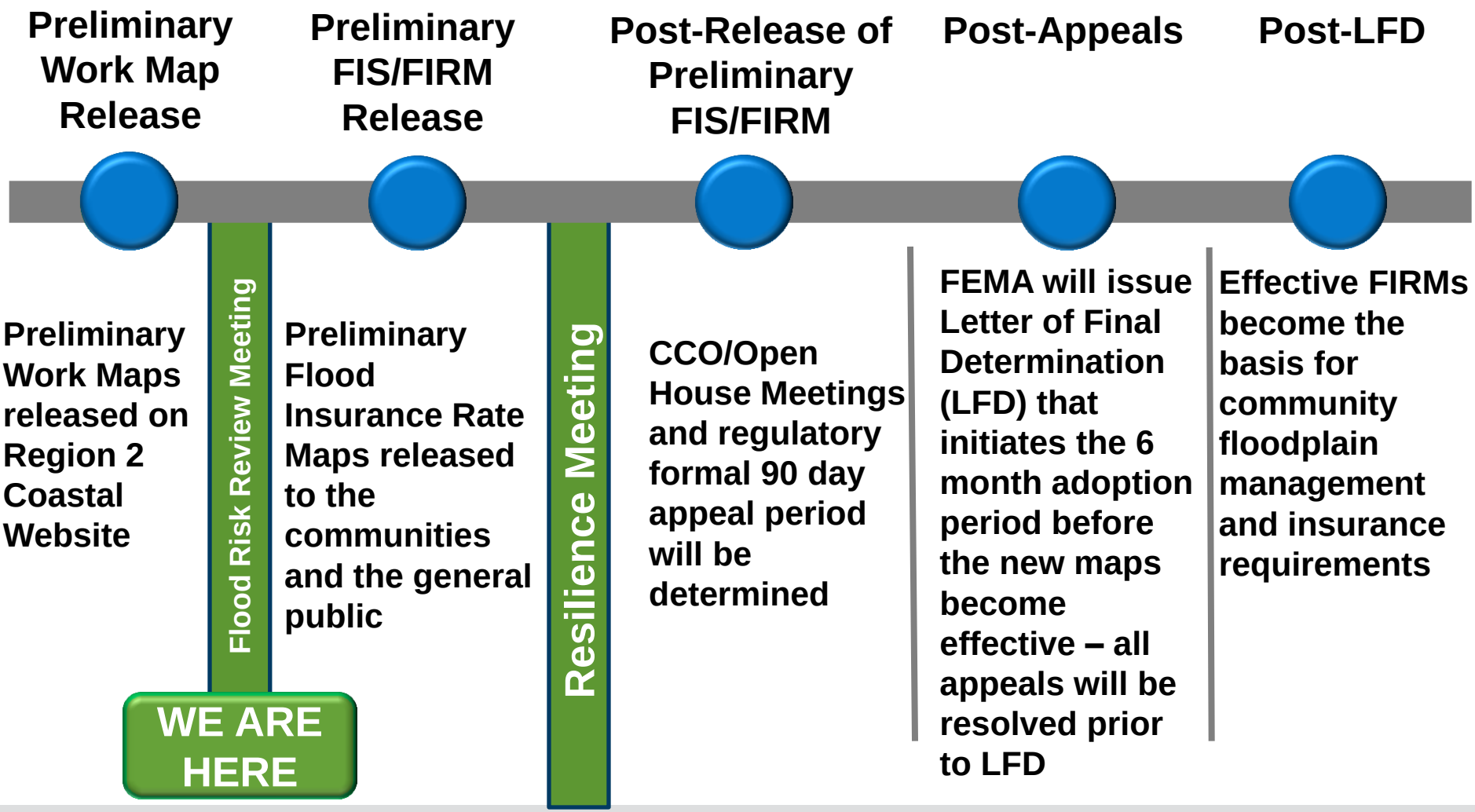
What will save you now can cost you in the future



Timeline for Westchester County – Past

- **NJ/NY Coastal Flood Risk Study – started in 2009**
- **Post-Sandy:**
  - ABFEs released and multiple meetings held with local officials and public
- **Discovery:**
  - August 28-29, 2013
- **Preliminary Work Maps:**
  - August 20, 2014
  - Meeting with local officials

Timeline for Westchester County – Future



Conclusion: Community Resilience

Risk Changes Over Time → **FEMA Provides Best Available Data** → **Community Officials Adopt Higher Standards** → **Property Owners Build to Higher Standards** → **More Resilient Communities Are Created**

Together, we all can create stronger and safer communities

Breakout Groups

- **Modeling / Engineering / Mapping: Group 1**
- **CSLF and Depth Grids: Group 2**
- **AOMI & Hazard Mitigation Planning and Actions: Group 3**
- **Floodplain Management: Group 4**
- Group 1: Croton, Greenburgh, Cortland, Ossining
- Group 2: Railroad, New Rochelle, Westchester County
- Group 3: Pelham Manor, Mount Vernon, Irvington, Yonkers
- Group 4: Mount Pleasant, Larchmont, Peekskill, Tarrytown

Thank you for your participation!

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