RiskMAP
Increasing Resilience Together

Erie County
Flood Risk Review Meeting

January 18, 2018

FEMA

Agenda

- The value of updated flood maps for your community
- Review updated flood-risk data and important next steps in the Risk MAP process
- Increasing mitigation opportunities in your community
- Working session to review maps

Erie County

The Value of Updated Flood Maps for your Community

Why Are We Here?

A new coastal flood hazard analysis is complete for your community and Draft Coastal Workmaps are ready for review.

Flood Maps Impact Important Decisions

To Identify and Assess the Flood Risk

To Establish Rates for Flood Insurance

To Determine Local Land Use

To Inform Engineers and Developers

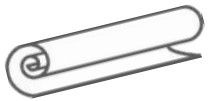
To Equip Emergency Managers

Why Update your Flood Maps?

Community	NFIP Policies	NFIP Claims	FEMA Claims Paid	Community Assistance Visits(CAV) / Community Assistance Contacts (CAC)	Hazard Mitigation Plan
Town of Brant	2	93	$3,117.75	CAV: 11/15/1995 CAC: 03/17/2017	Approved
Town of Evans	136	89	$440,026.00	CAV: 08/24/2005 CAC: 08/02/2005	Approved
Town of Grand Island	37	27	$61,576.00	CAV: 07/15/2008 CAC: 12/11/1997	Approved
Town of Hamburg	121	155	$1,301,092.00	CAV: 11/20/2015 CAC: 04/13/2005	Approved
City of Tonawanda	5	10	$20,002.00	CAV: N/A CAC: 02/03/2017	Approved
Village of Angola	2	19	$91,619.00	CAV: 04/01/1983 CAC: 06/20/2007	Approved
Village of Blasdell	0	25	$150,556.00	CAV: 01/22/1992 CAC: 02/24/2011	Approved
City of Buffalo	106	414	$1,060,405.00	CAV: 04/26/2017 CAC: 04/08/2005	Approved
City of Lackawanna	383	93	$109,946.00	CAV: 04/01/2009 CAC: 06/26/1998	Approved

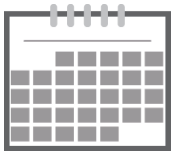
Your Role

Local Officials, Floodplain Administrators and Staff



Provide technical review of preliminary data

Submit questions and comments to FEMA

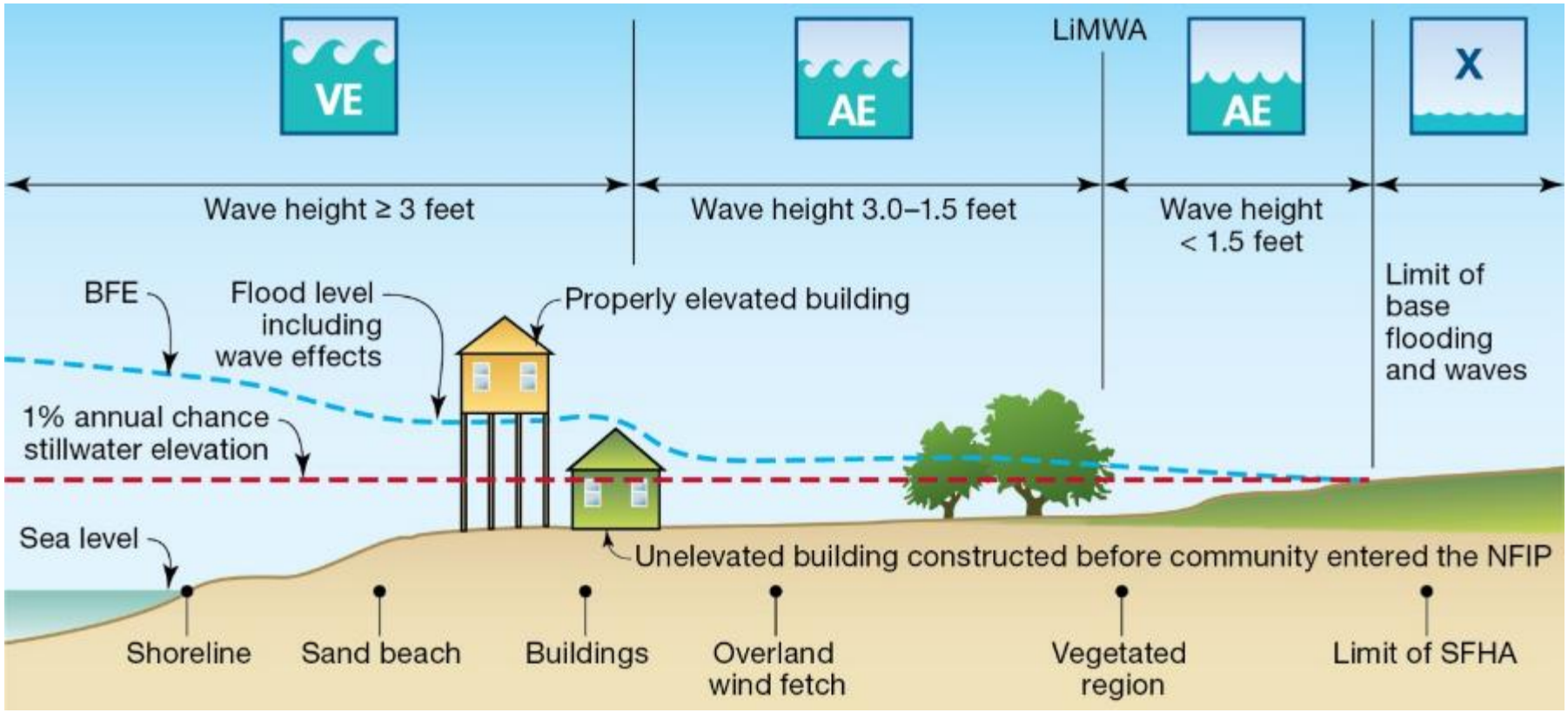


Share new flood risk info with property owners and stakeholders

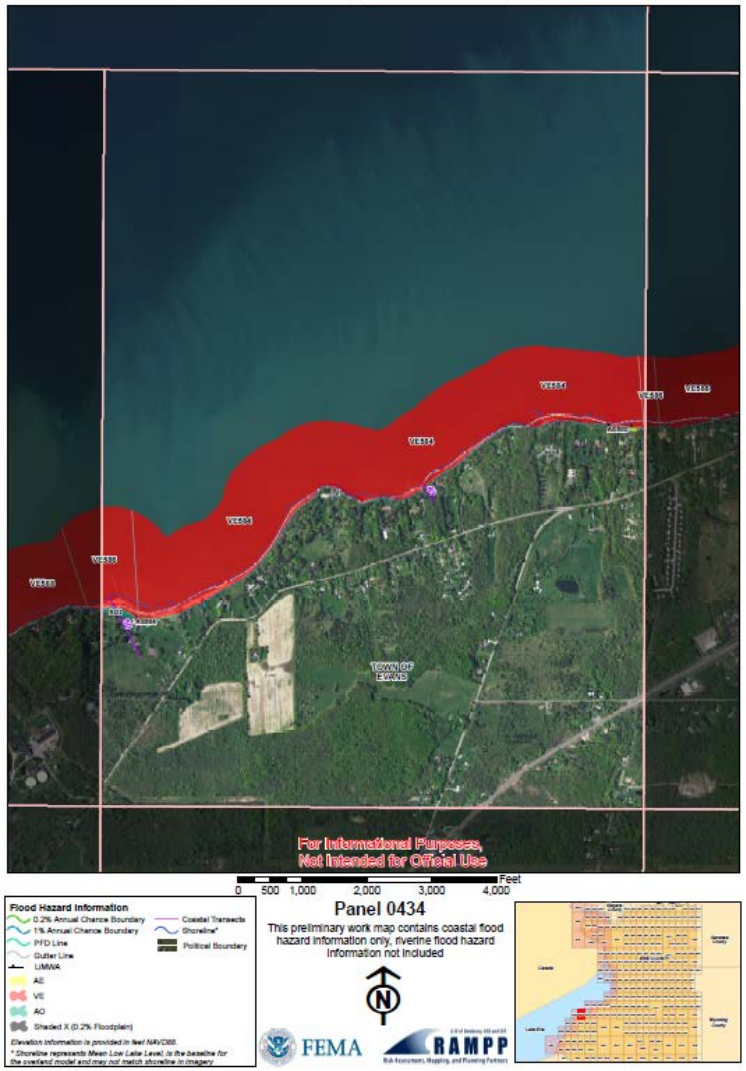
Identify mitigation needs and priorities

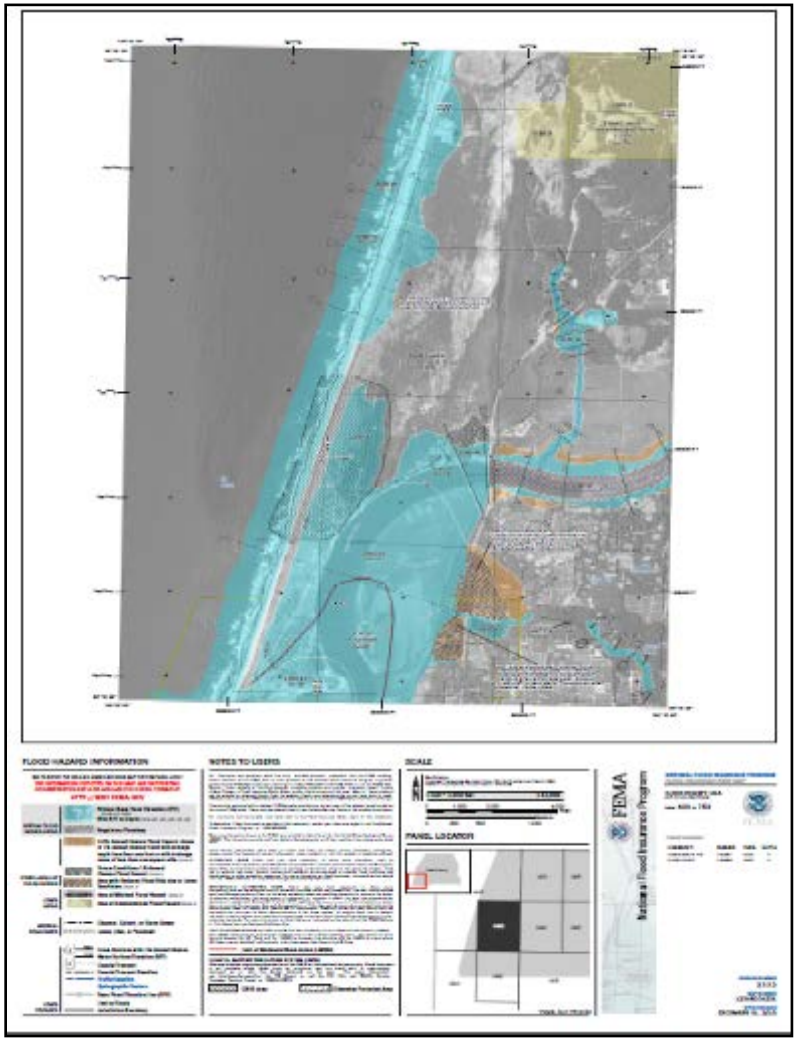
Update local plans, codes, and ordinances

Detailed Coastal Mapping

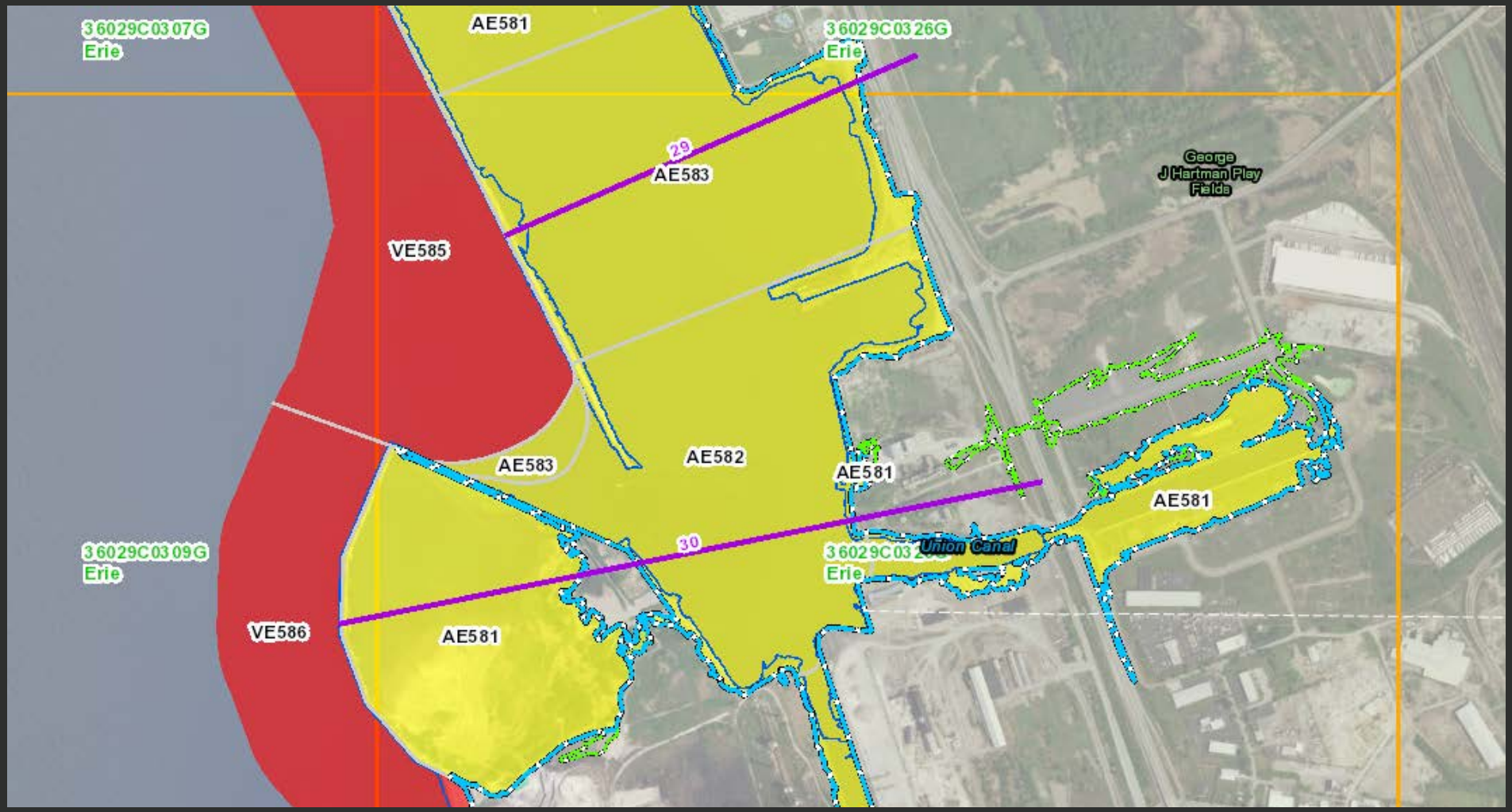


Coastal Work Map vs. FIS/FIRM





WORK MAPS WILL NOT AFFECT FLOOD INSURANCE REQUIREMENTS OR COSTS



Modeling the Special Flood Hazard Area (SFHA)

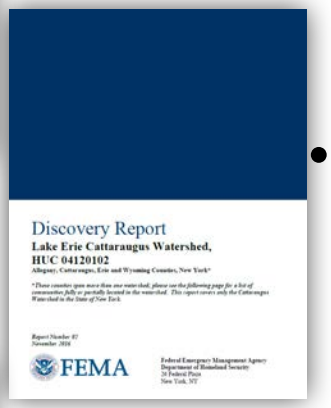
VE, AE, and AO Zones are "100-year floodplain" with a **1-percent-annual-chance of flood**

- Insurance is **required** if you have a federally backed mortgage <u>or</u> received federal disaster assistance
- Informs building code standards

Erie County

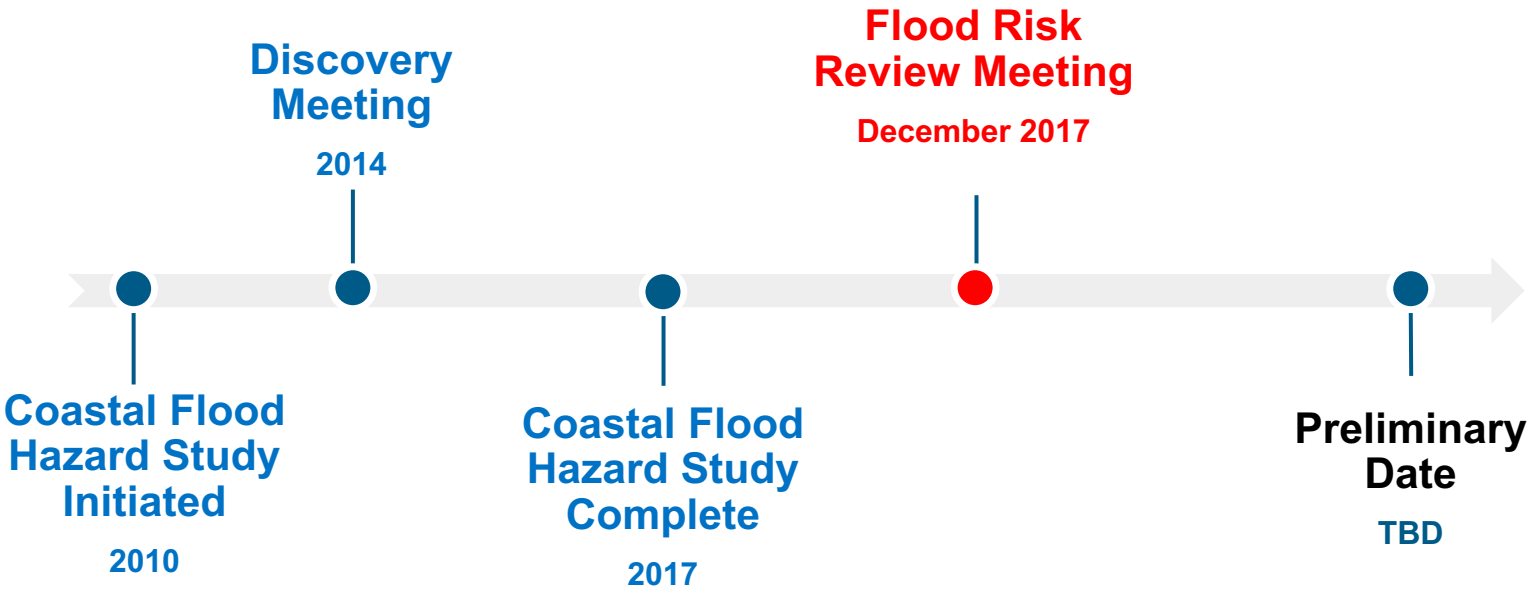
The Risk MAP Process and Scope

Discovery Reports 2016

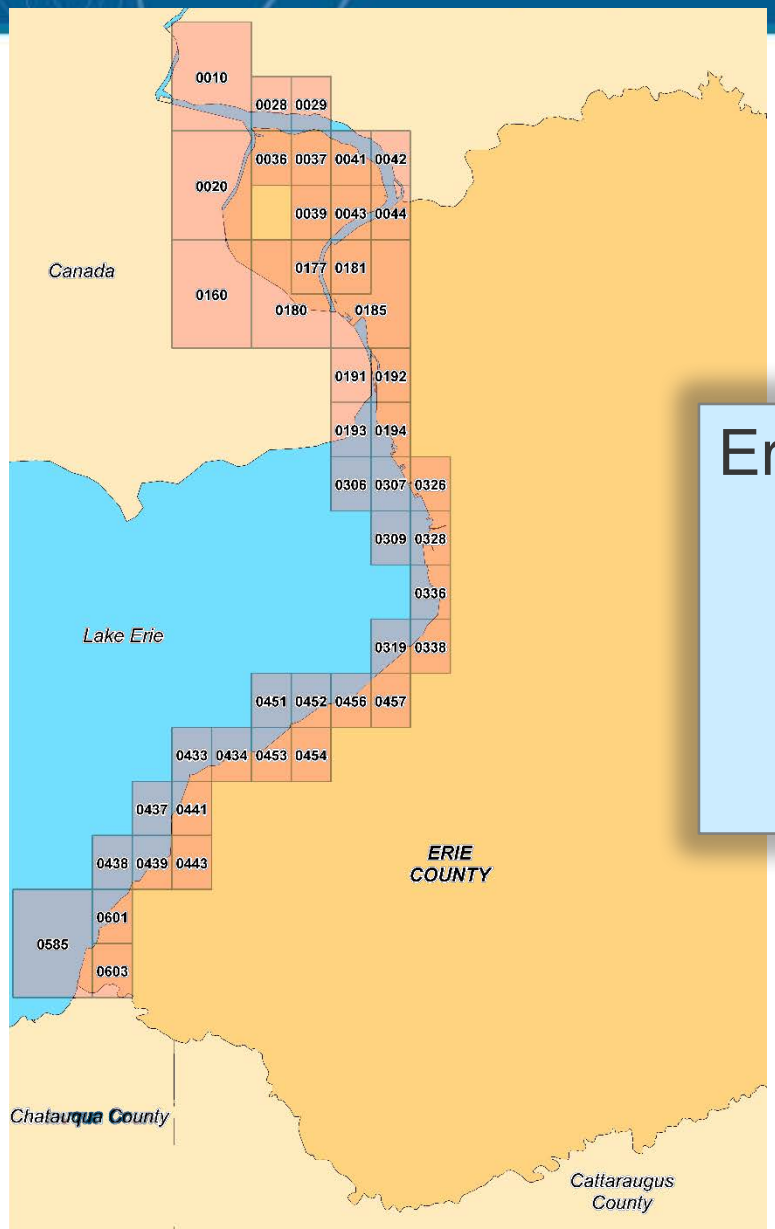


- A few studies are outdated. Base Flood Elevations do not reflect dredging, depth or higher ground added around water bodies.
- Flooding and erosion of Lake Erie are major concerns, affected by changes in precipitation and inflow from other Lakes.
- Lake flooding has damaged homes along the shore and costs of property damage have run into the millions.

Project Timeline and Schedule



Study Area



Erie County

- 12 Coastal Communities
- ~160 miles of shoreline (Lake Erie)
- Coastal Storm Flooding update
- 2008 FEMA Erie County LiDAR

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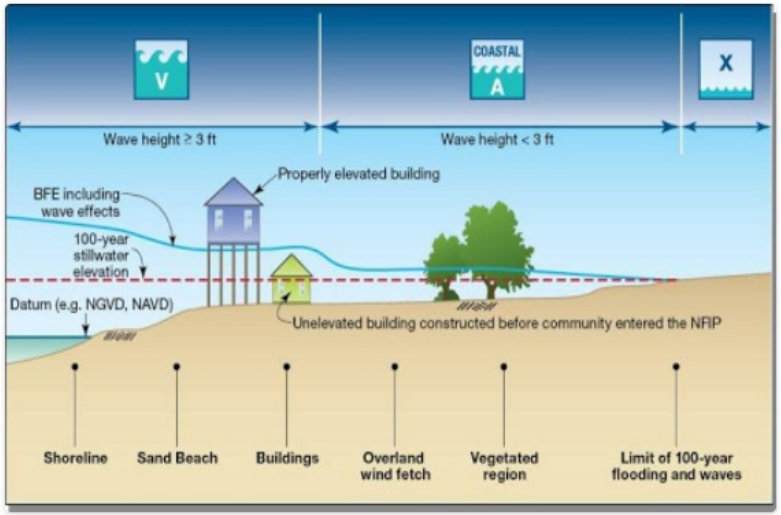
Effective vs New Coastal Study

Coastal Study Component	Effective Erie County (2008)	New Study (2017)
Topographic Data	5 -20 ft. Interval Contours (dating back to 1963)	FEMA Erie County LiDAR (2008)
Stillwater Elevation (SWEL)	Gage Frequency Analysis (USACE 1975 and 1998)	Lake Erie Storm Surge Study (2012)
Modeled Transects	0	64
Wave Setup	No	Yes
Wave Runup	No	Yes
Limit of Moderate Wave Action (LiMWA)	No	Yes

Study Approach

- Regional Study Approach
  - Water level and wave analysis
  - Improvement over community-county
  - Reduces number of boundary conditions
  - Greater consistency in assumptions



- Local/County Level Activities
  - Mapping level tasks performed at county level
  - Nearshore wave transformations
  - Wave runup
  - Overland wave propagation

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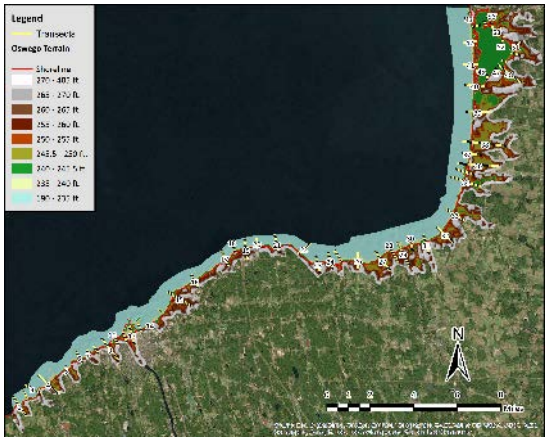
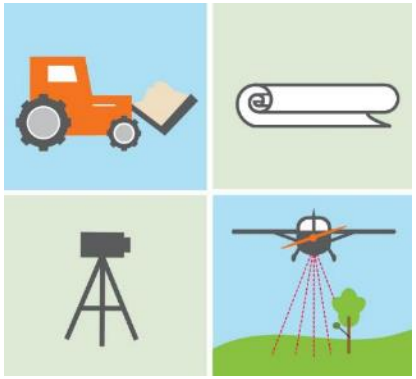
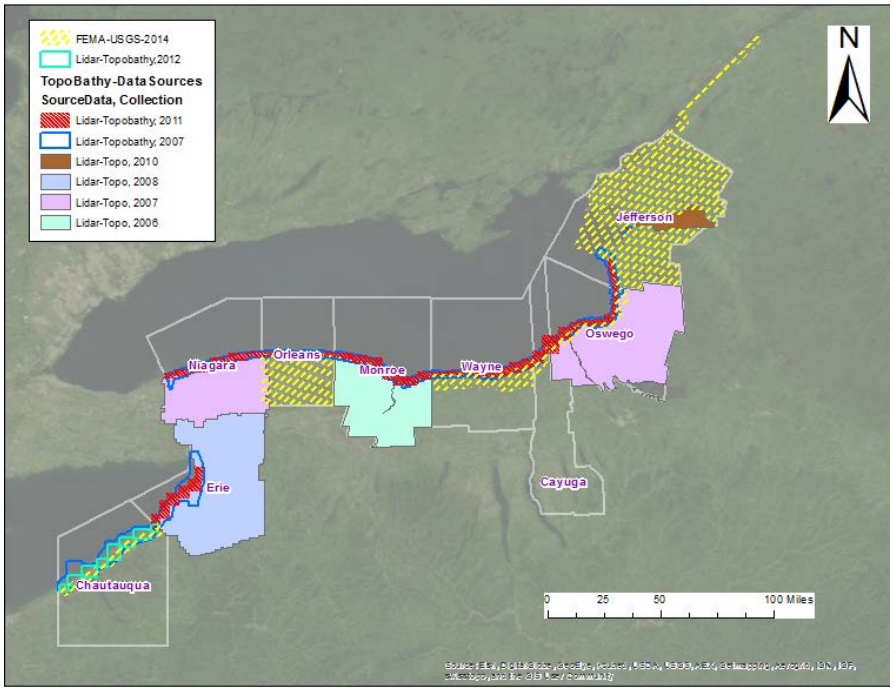
Light Detection and Ranging (LiDAR)







Terrain Dataset

Used for modeling & mapping

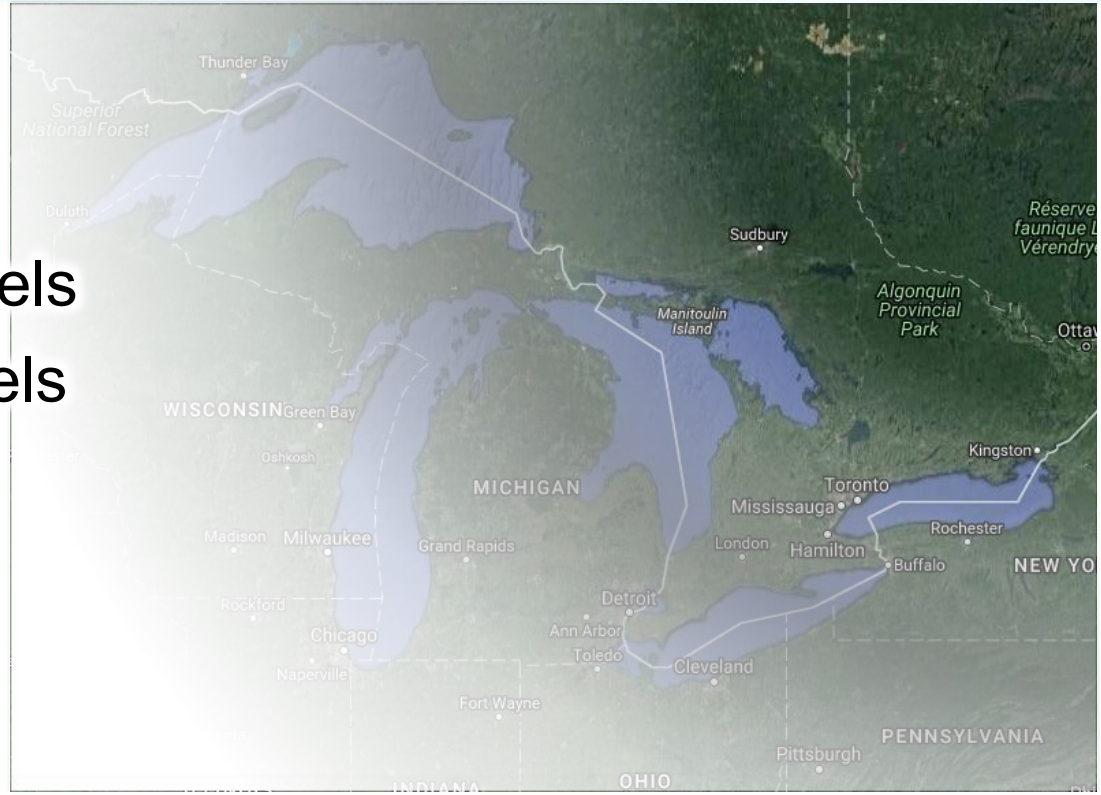
LiDAR Data Sources

2008 FEMA Erie County LiDAR
2007 and 2011 USACE/JALBTCX Great Lakes Topo/Bathy LiDAR
1999 USGS NED 1/3 arc-second ArcGrid
1940 and 1980 NOAA Hydrographic Survey Data

Storm Surge Study Technical Support

Five Report sections

- Short-term Water Levels
- Long-term Water Levels
- Statistical Analysis
- Storm Surge model Setup and Validation
- Storm Production



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Storm Surge From 3-10-2002

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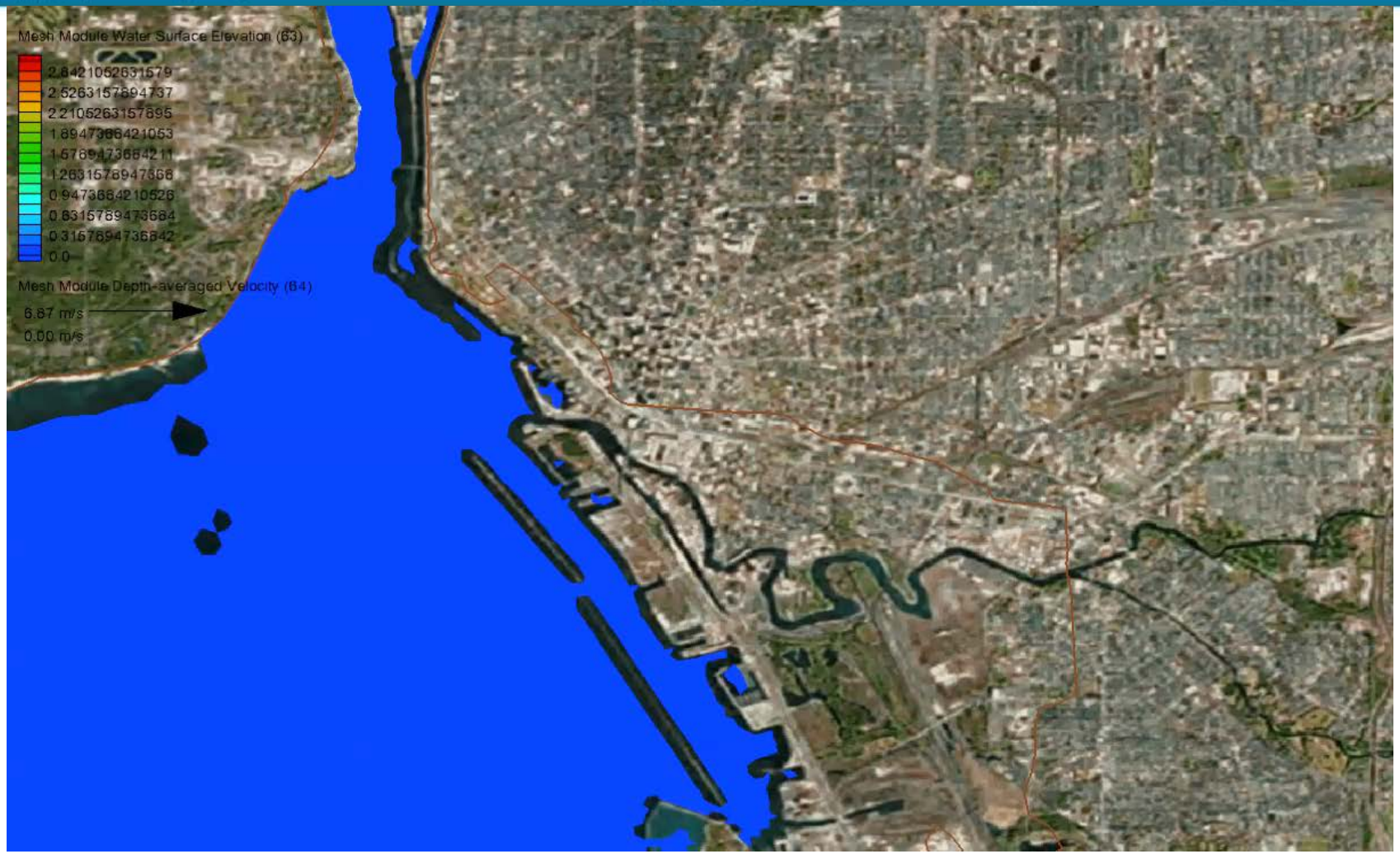
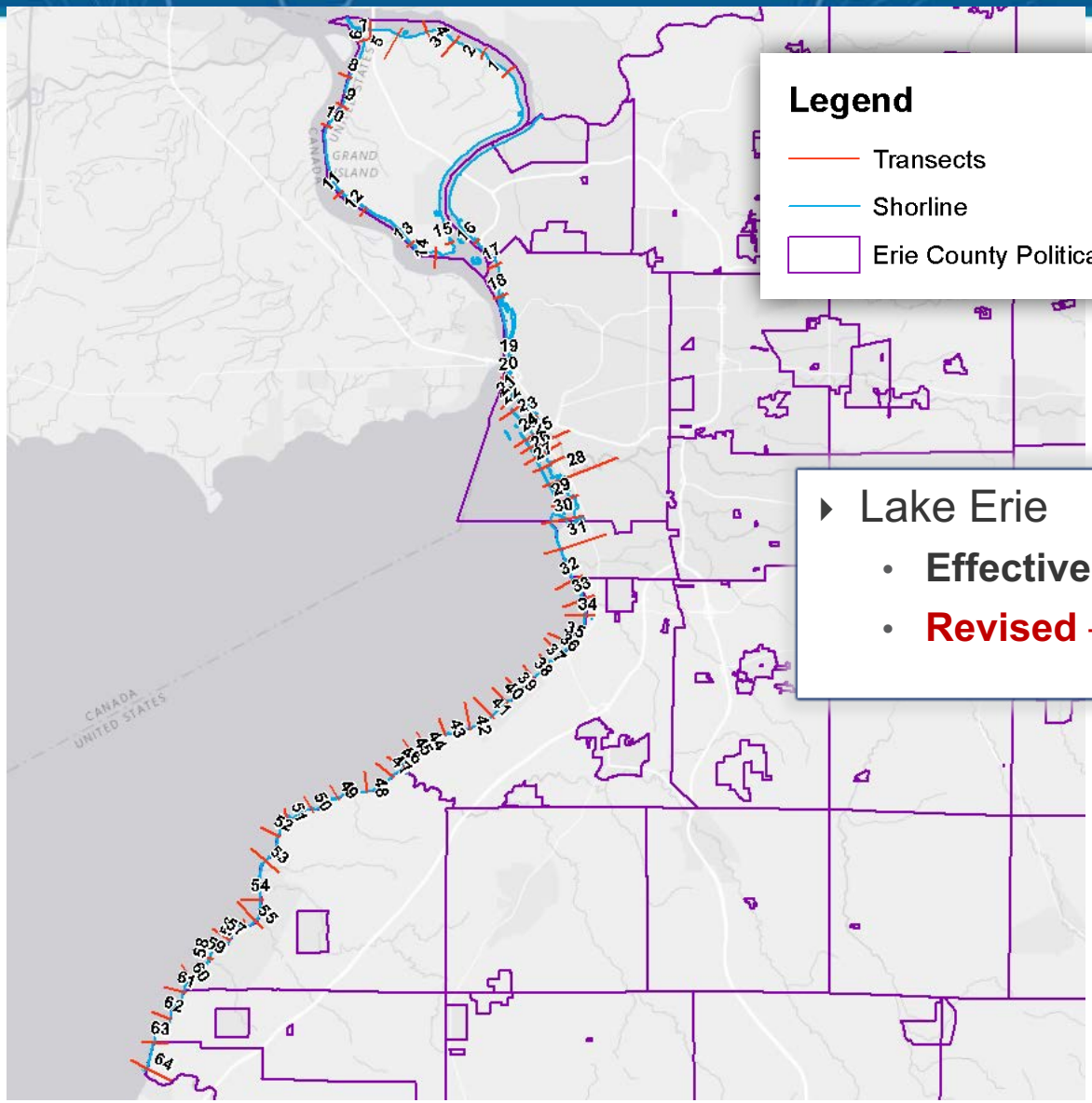
Storm Surge From 3-10-2002



Erie County Transects



- Lake Erie
  - **Effective** – **579 – 580** feet NAVD 88
  - **Revised** – **568 - 600** feet NAVD 88

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Field Reconnaissance

Erie County NY *Transect:* TR07 *Review Location:* 07_1 *Team:* Jeff Sample & Yi Zheng *Date:* 7/23/2014 *Time:* 5:12:05 PM	
Location Description	By I 190. No direct acces to shoreline. Photos are taken in surrounding area.
Water Body	Niagara River
Latitude, Longitude	N43.06 W78.9901
Fetch Description	Limited Fetch
Coast Description	None
PFD	None
Structure Description	None
Vertical Structure	None
Building Description	None
Vegetation Description	trees, at back of transect, Diameter 10inch, Height 60ft, Spacing 15ft
Marsh Description	Phragmites Australis, at back of transect, Height 6ft, Number of Plants 64, Base Stem Diameter 0.2inch, Top Stem Diameter 0.2inch
General Comments	marsh and trees at back of transect

Photographs and Description

Photo ID:: 20140723171218.jpeg

Description: marsh

Photo ID:: 20140723171236.jpeg

Description: trees

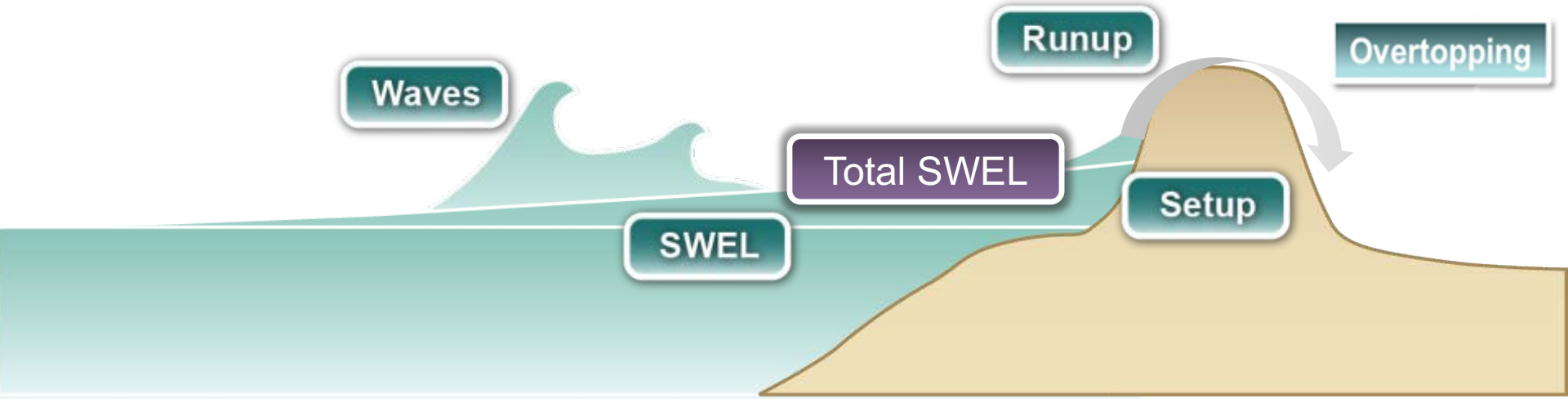
Photo ID:: 20140723171205.jpeg

Description: marsh

RAMPP

Page 2 of 2

Coastal Base Flood Elevation

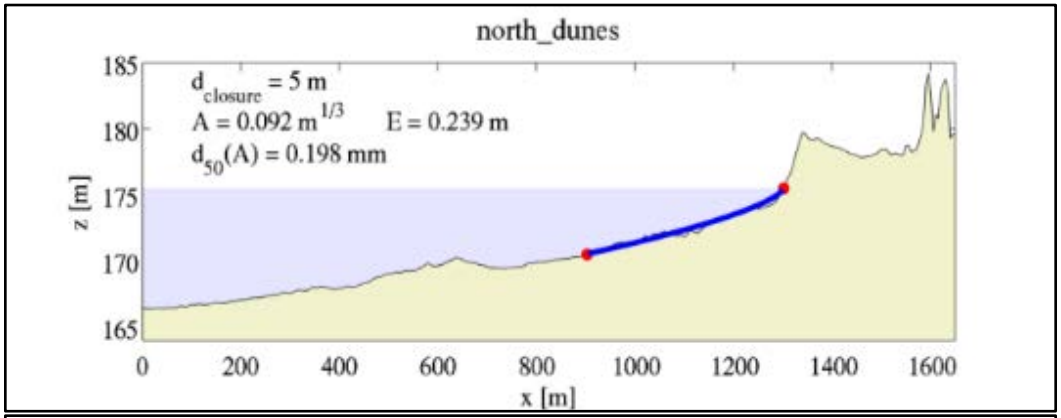


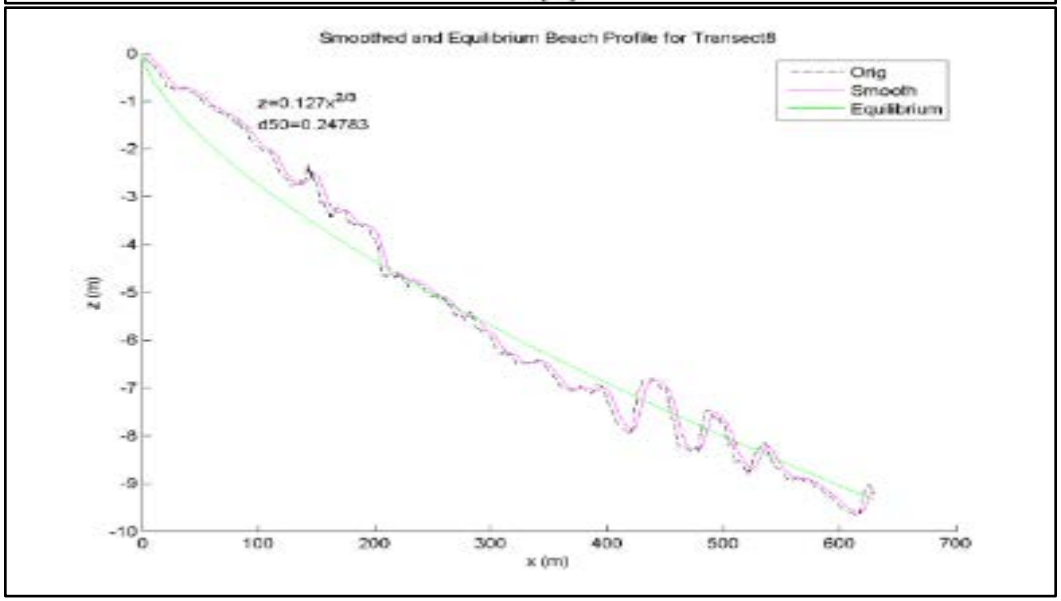
SWEL = Stillwater Elevation (storm surge level)
Total SWEL = Stillwater Elevation, inclusive of wave setup

Erosion in the Great Lakes

USACE CSHORE model

- Applies real physics
- Near-shore wave processes
- Cross-shore and along shore sediment transport
- Requires sediment grain size





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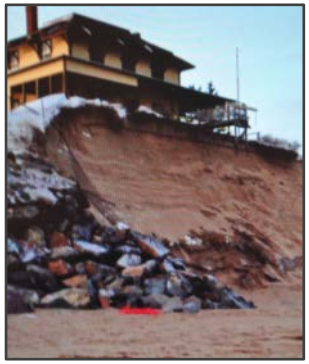
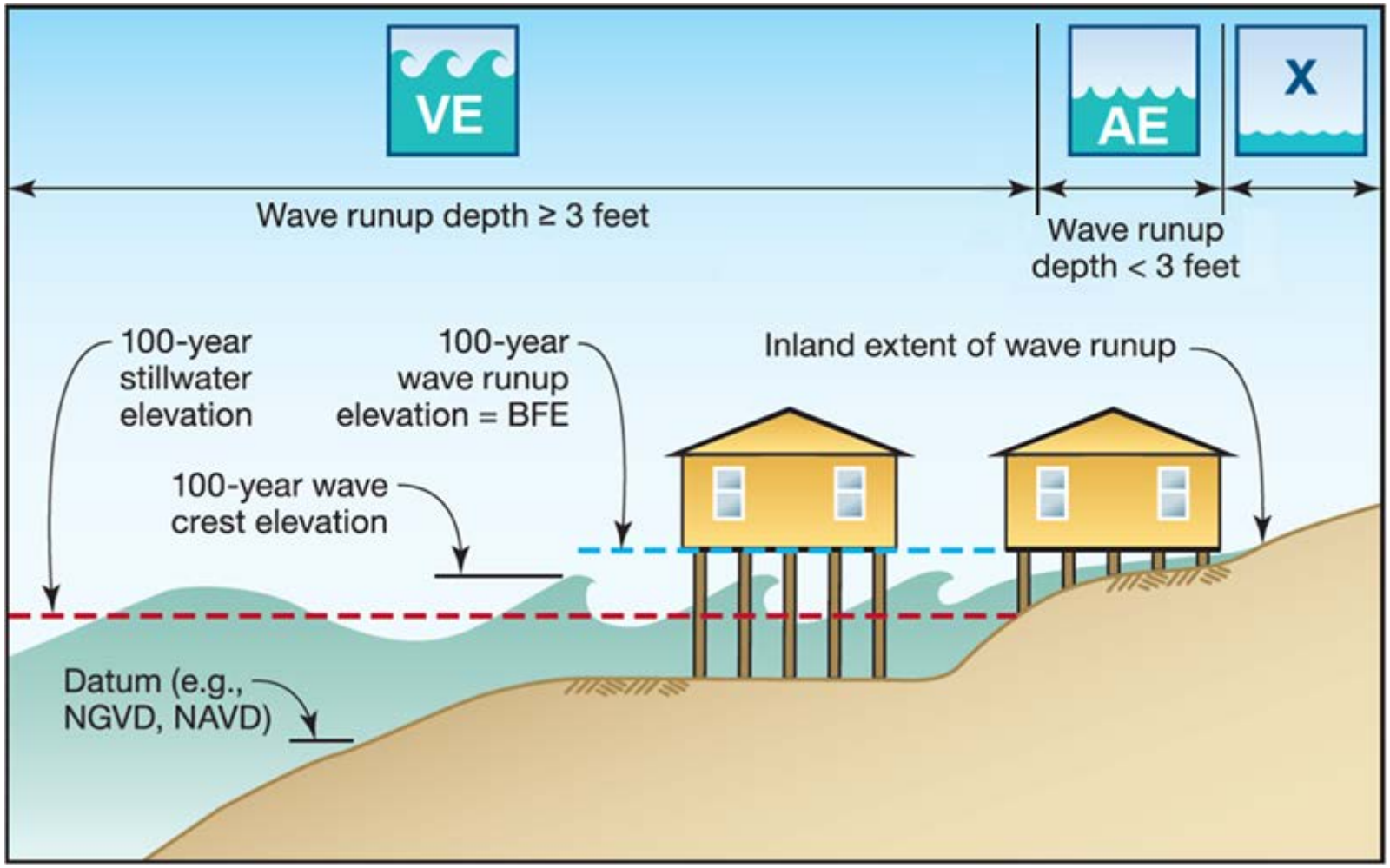
Coastal Erosion and Scour



The two most damaging aspects of coastal flooding for coastal buildings are erosion and scour.

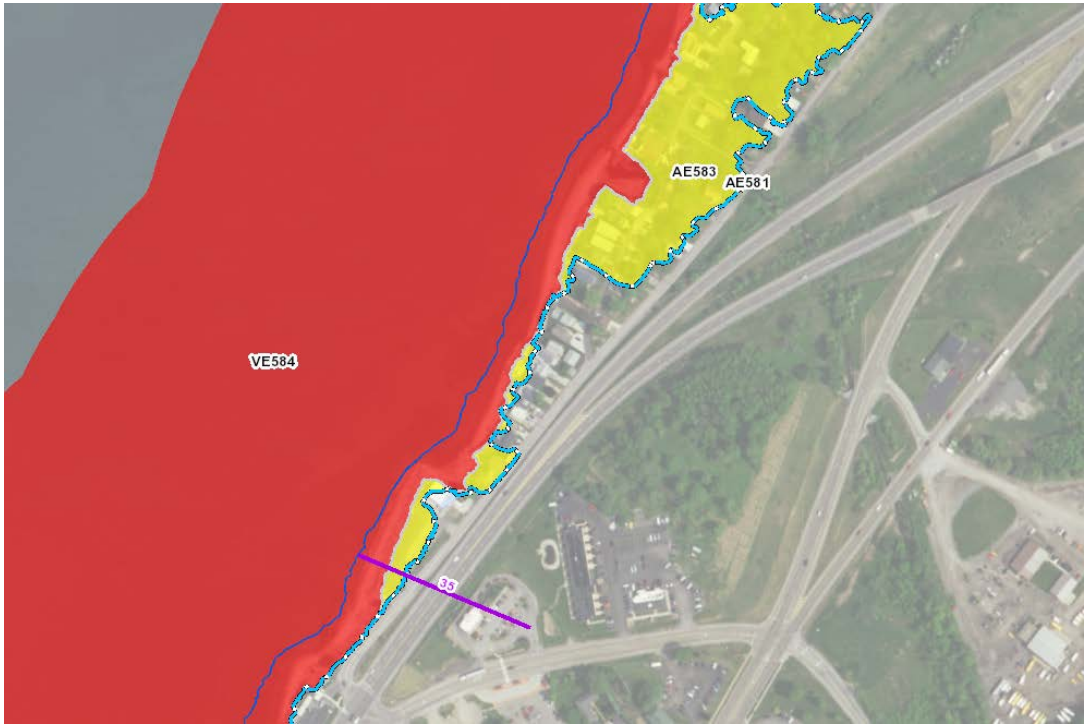
- Erosion should be considered in determining foundation depths and heights.
- Nature and extent of soil loss expected around a building is critical.
- A slab is not a substitute for adequate embedment.

Detailed Coastal Mapping – Wave Runup



Wave Runup

- Rush of water that extends inland when waves come ashore
- These elevations may be higher than the stillwater elevations developed as part of the storm surge analysis
- Wave effects have been mapped for the first time for most of this area



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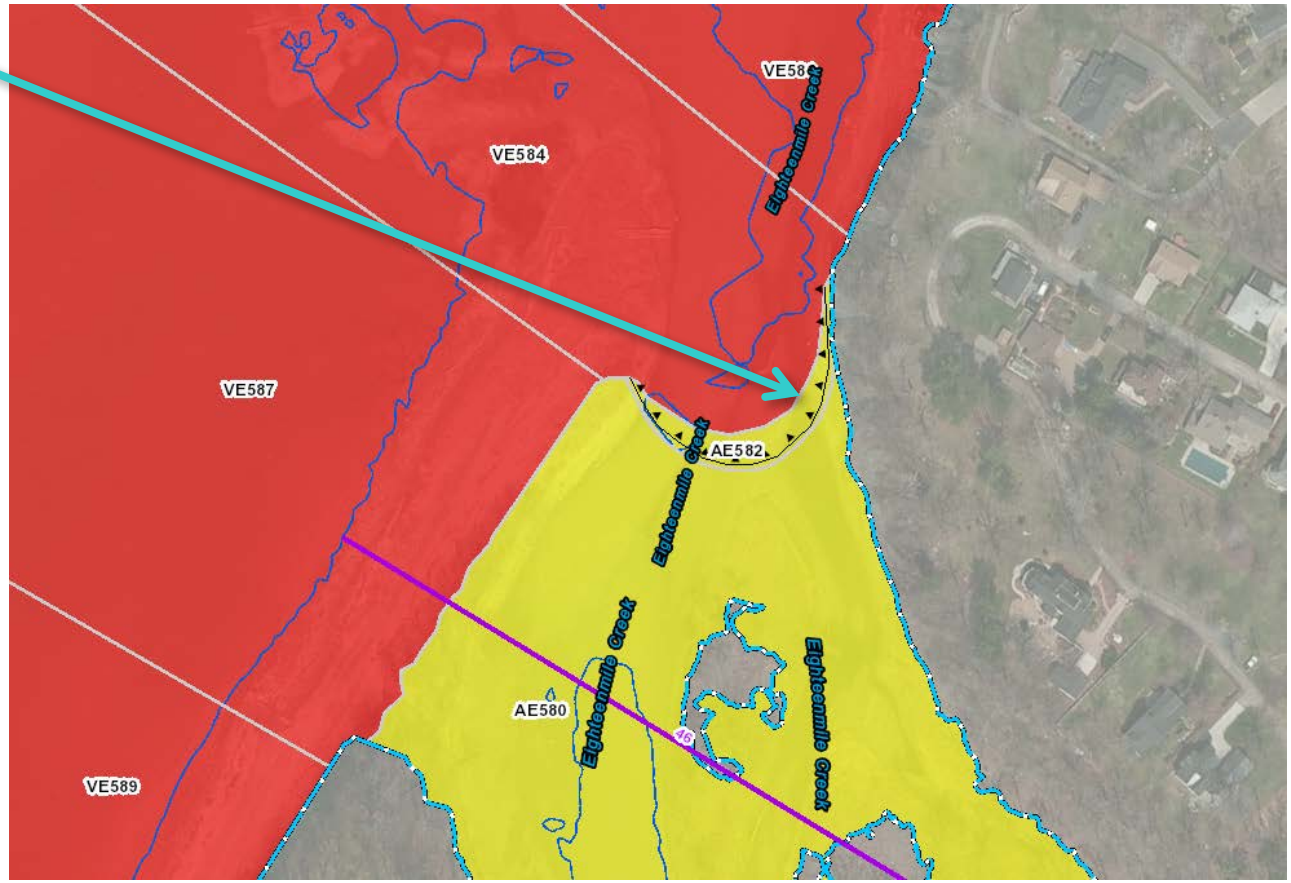
Wave Overtopping – AO Zones

- Overtopping Rate Considerations for Establishing Flood Insurance Rate Zones
- Ponding Considerations
  - Areas where AE not present beyond slope break
  - Duration of overtopping
  - Topography
  - Drainage landward of the overtopped barrier

Limit of Moderate Wave Action - LiMWA

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



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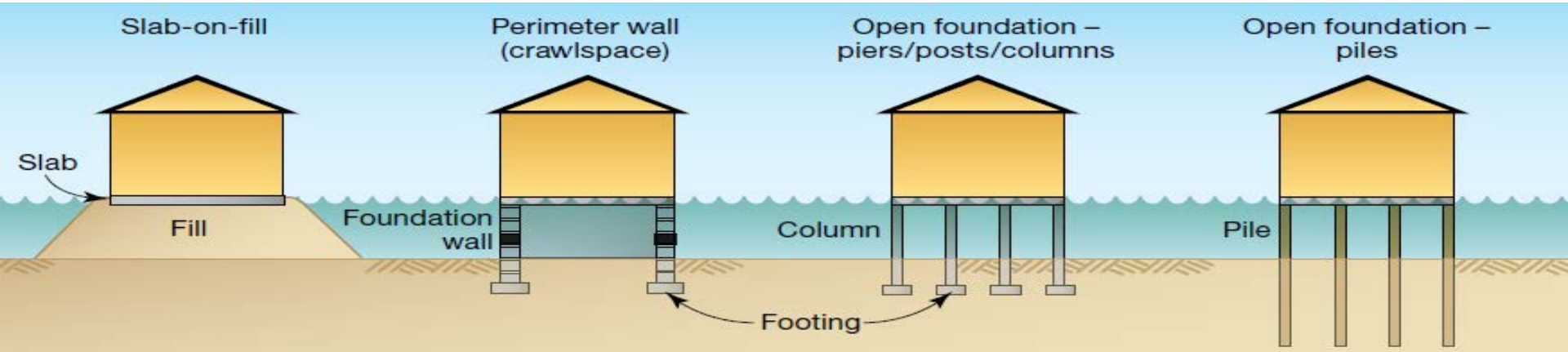
Development Requirements

A Zones

- Slab-on-grade / Slab-on-fill
- Fully-enclosed foundation wall (flood openings required)
- Open foundation on piers, posts, piles, or columns
- Top of lowest floor elevated to or above the BFE
- AO Zone – elevate to or above flood depth number or 2 feet above HAG

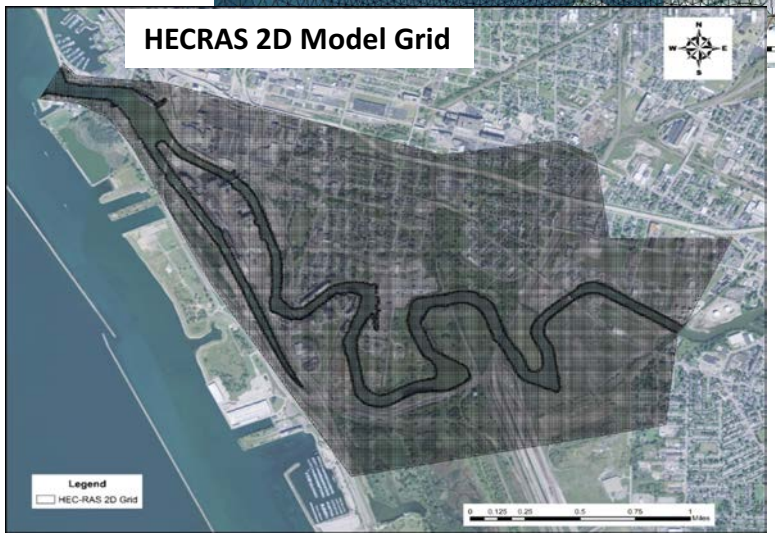
V Zones

- Open foundation on columns or piles
- Free of obstruction or use of breakaway walls/lattice work
- Parking, access, and storage
- Designed by a registered design professional
- Bottom of lowest horizontal structural member to or above BFE



Buffalo River Mapping

- **Enhanced Storm Surge Modeling**
- **Lake-wide Storm Surge Model**
  - **Lacked resolution in the channel (Max: 200 feet)**
  - **Boundary conditions at River mouth**
- **USACE's HECRAS model**
  - **2-Dimensional (2D) Modeling**
  - **Cell resolution: 10 feet**
  - **Time Step: 1 sec**
  - **DS Boundary: Storm Surge Study**
- **Overtopping volume mapped**



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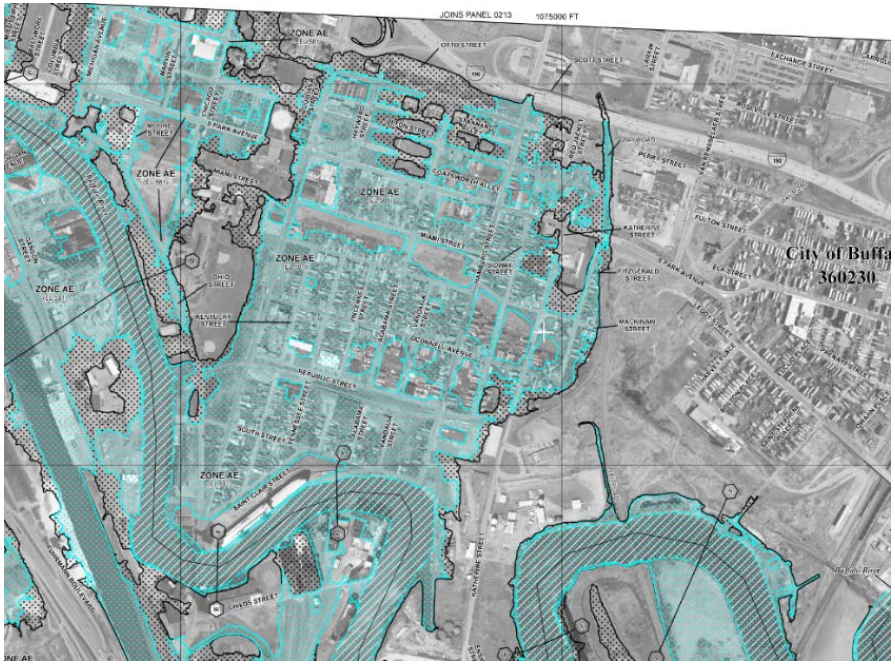
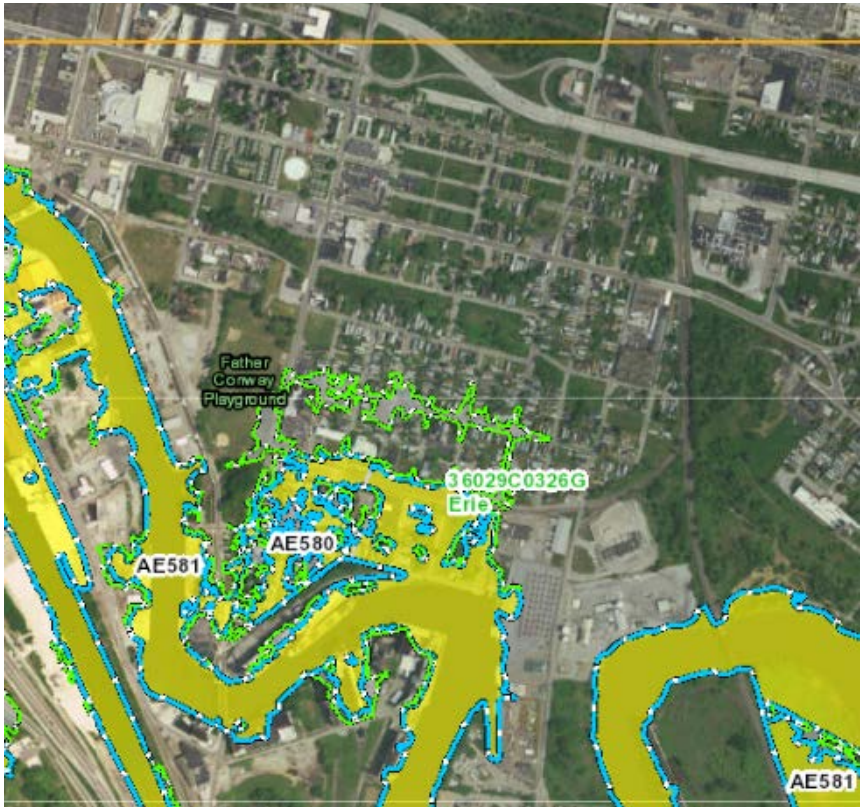
Preliminary Vs Workmap





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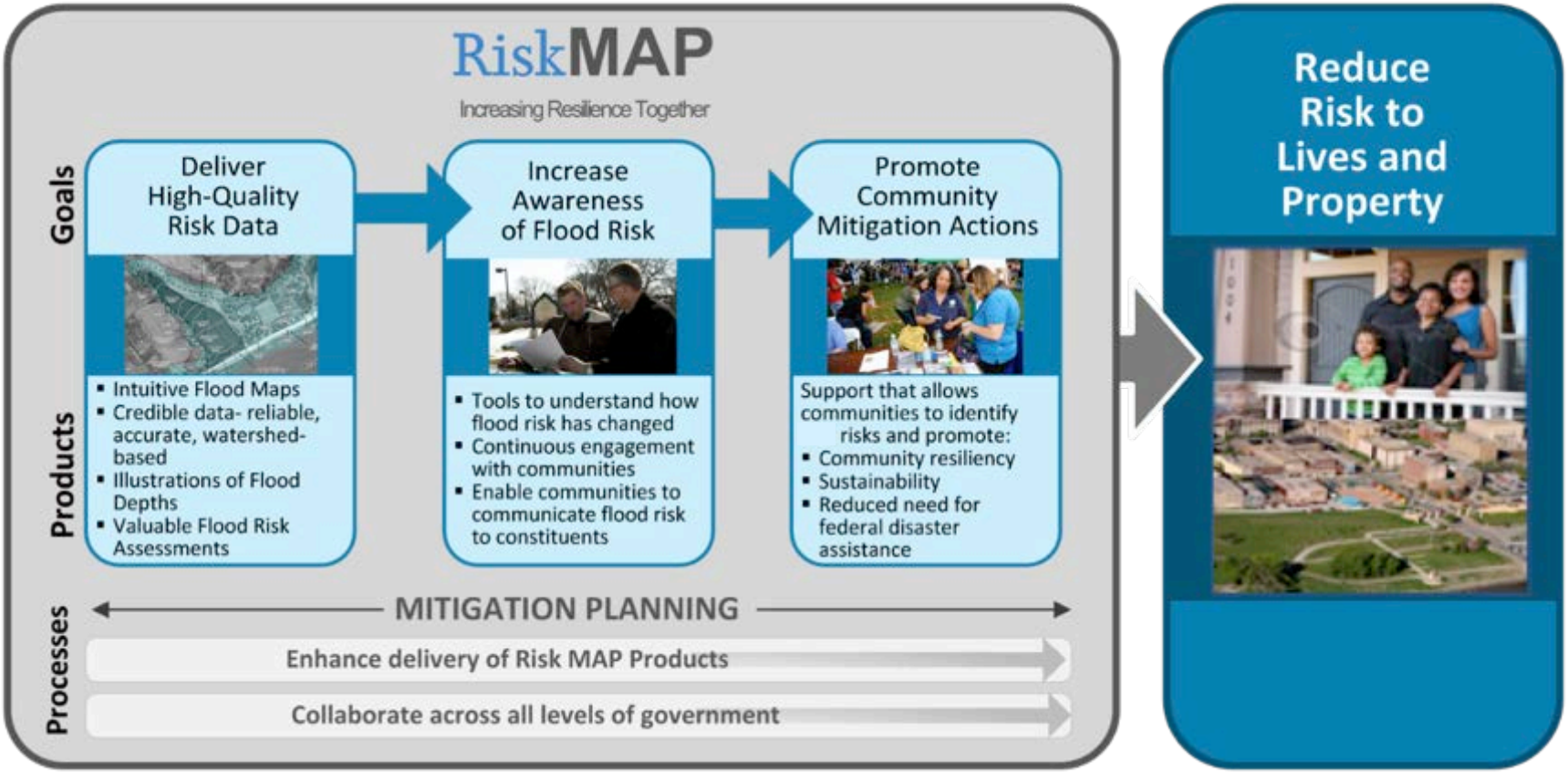
Increase Mitigation Opportunities

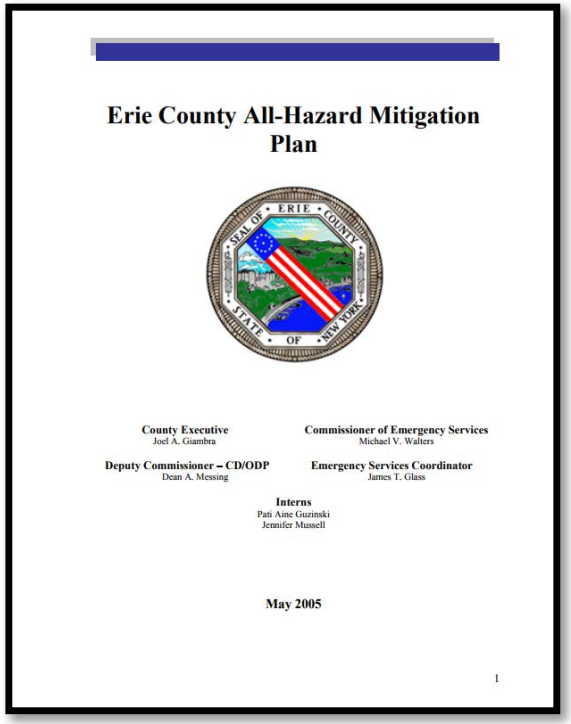
Goal: Stronger and Safer Communities



Proposed Mitigation Actions

From the Hazard Mitigation Plan

- Building setback will be increased along Lake Erie to reduce potential erosion and its impacts. Multiple municipalities proposed this effort.
- Better enforcement of zoning regulations.
- Implement response protocols to remove ice/debris jams from waterways.
- Conduct outreach and public education pre-/post-hazard event.



Erie County All-Hazard Mitigation Plan

County Executive
Joel A. Giambra

Commissioner of Emergency Services
Michael V. Walters

Deputy Commissioner – CD/ODP
Dean A. Messing

Emergency Services Coordinator
James T. Glass

Interns
Pati Aine Guzinski
Jennifer Mussell

May 2005

1

ERIE COUNTY, NEW YORK
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN UPDATE

Draft

REVISED DRAFT
FEBRUARY 2015

PART 1 OF 2:
Main Text

Prepared by:
URS

FEMA

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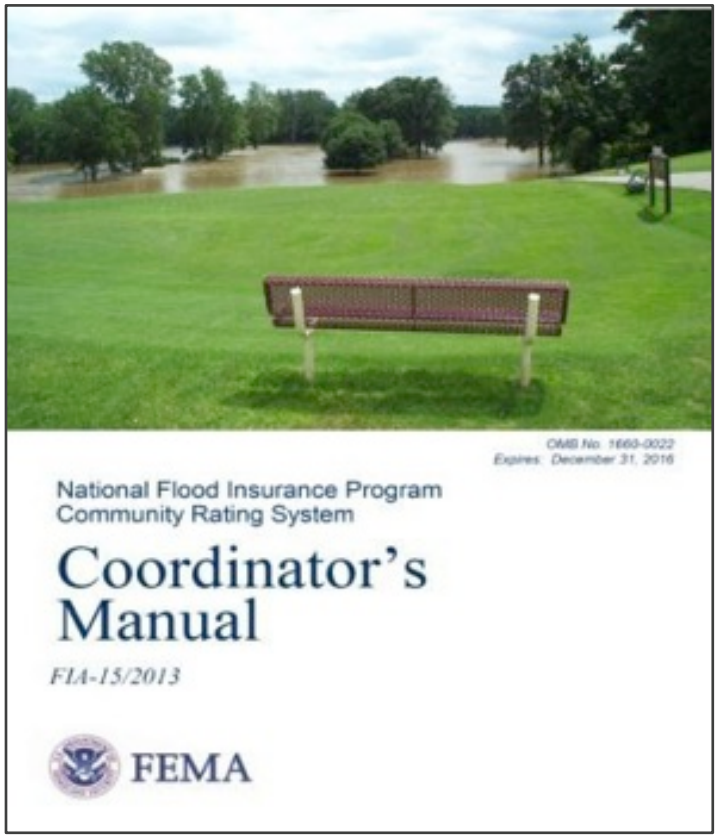
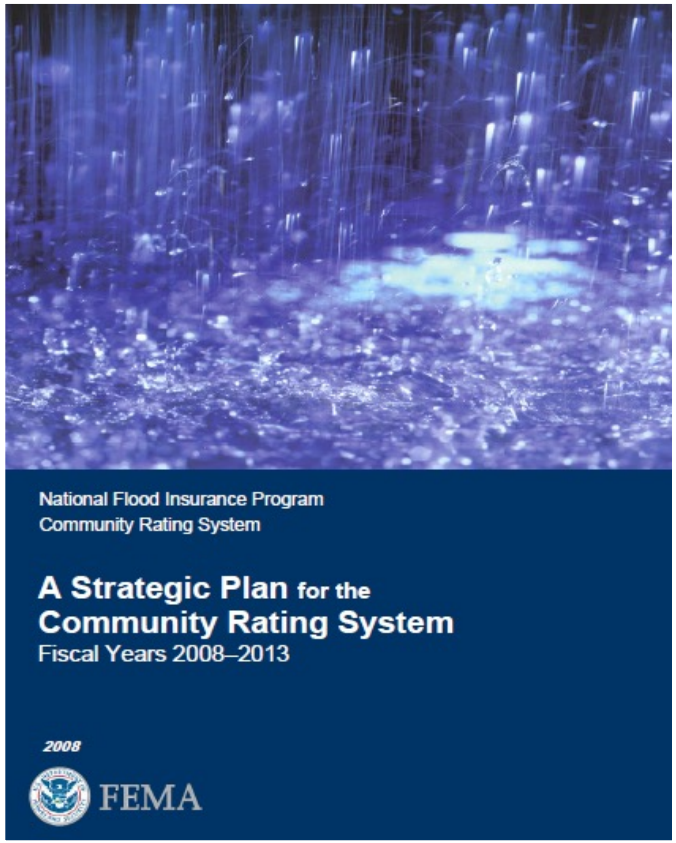
Grants Overview

- **Grants available AFTER a disaster**
  - Hazard Mitigation Grant Program (HMGP)
- **Grants available BEFORE a disaster**
  - Pre-Disaster Mitigation (PDM) Program
  - Flood Mitigation Assistance (FMA) Program
- **FEMA awards grants to States, tribes, and territories**
  - Communities contact State Hazard Mitigation Office (SHMO) if interested in applying for HMA

NFIP Community Rating System Program Basics & Benefits

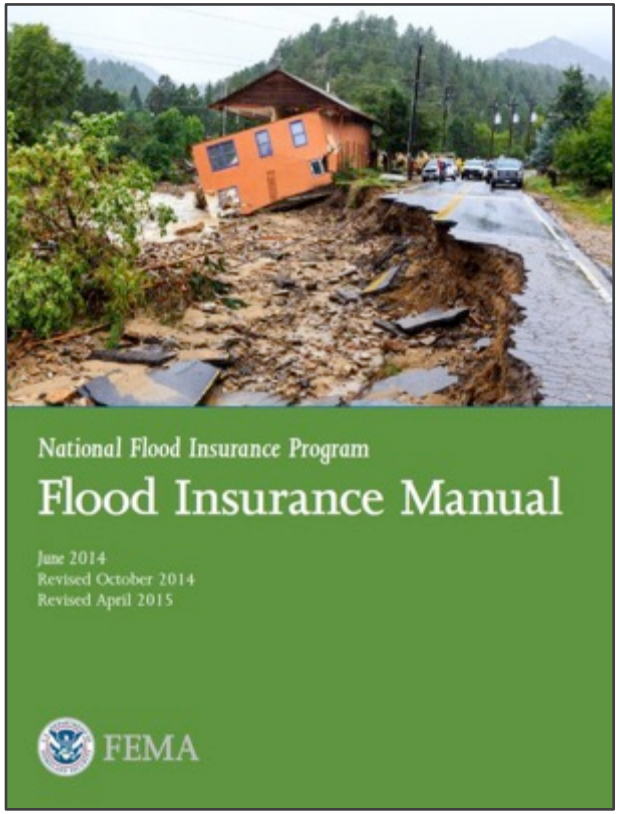




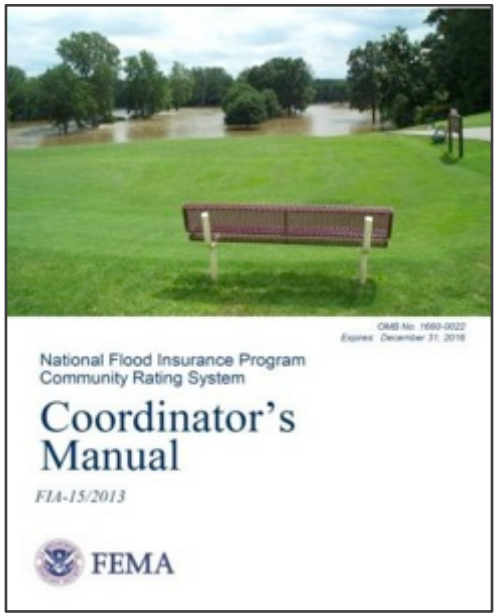
www.CRSResources.org

CRS Community Requirements

- Be in full compliance with the NFIP
- Implement activities
- Maintain Elevation Certificates
- Verification visit every 3 to 5 years
- Recertify each year
- Must meet Class prerequisites
  - Repetitive loss (Class 9)
  - BCEGS 5/5 or better (Class 6)
  - BCEGS 4/4 or better; 1 foot of freeboard and more (Class 4)



CRS Coordinator's Manual – Series Organization



100 – Program Overview

200 – Procedures

300 – Public Information Activities

400 – Mapping and Regulations

500 – Flood Damage Reduction Activities

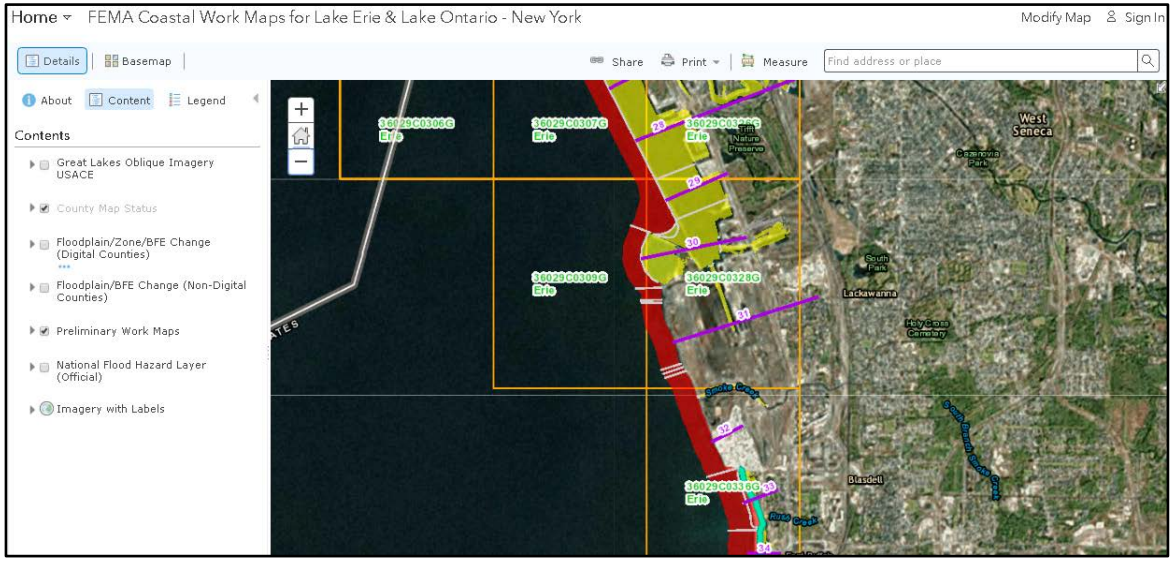
600 – Warning and Response

700 – County Growth Adjustment

Elements of a comprehensive community floodplain management program

Work Session:
Review floodplain mapping and flood risk products for validity. Ask questions!

Workmap Data Viewer



(http://arcg.is/1W5Ovq)

Questions about Maps?

Learn more at: http://www.greatlakescoast.org/

Contact our office:

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703-849-0584

Jeff Gangai

jgangai@dewberry.com

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Alan Springett
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Working Together to Build a Stronger & More Resilient Erie County

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