Introduction to Floodplain Mapping and Concepts

(and the NH Coastal Project)

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Building Resilience Through Better Floodplain Management
April 24, 2013

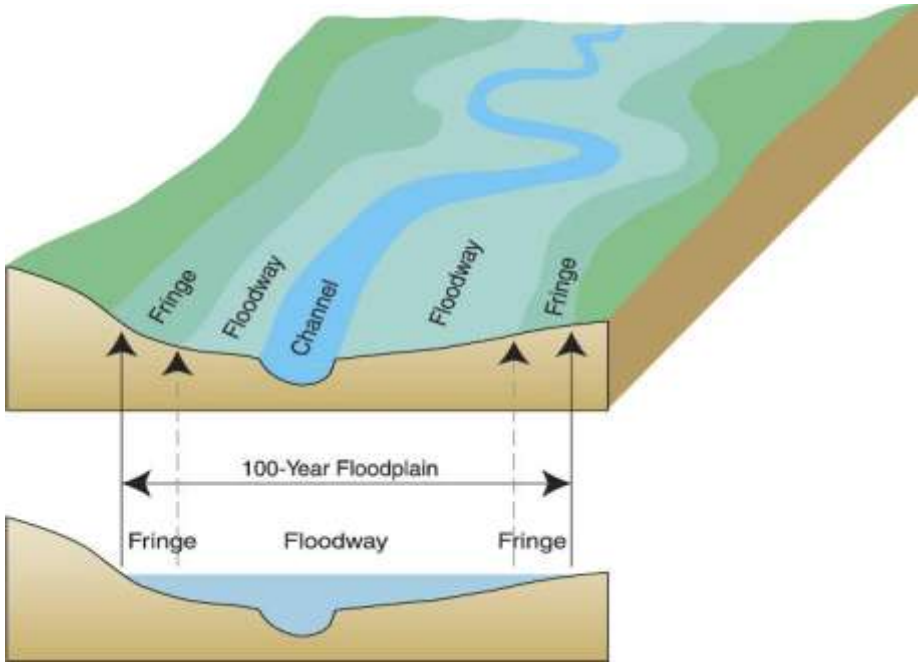
Presentation Outline

1. Floodplains defined
2. Methods for mapping floodplains
    a) Riverine
    b) Coastal
3. Risk MAP Overview
4. Current NH Coastal Risk MAP Project
5. Finding the Maps/Data

Definition of Floodplains

(from http://fema.gov)

"Any land area susceptible to being inundated by flood waters from any source. "



100-Year Floodplain

Base Flood – the flood having a 1-percent chance of being equaled or exceeded in any given year. Also known as the 1 percent chance or 100-year flood.

Base Flood Elevation (BFE) – the elevation of surface water resulting from a flood that has a 1 percent chance or greater of occurring in any given year.

Chance of Flooding over Time

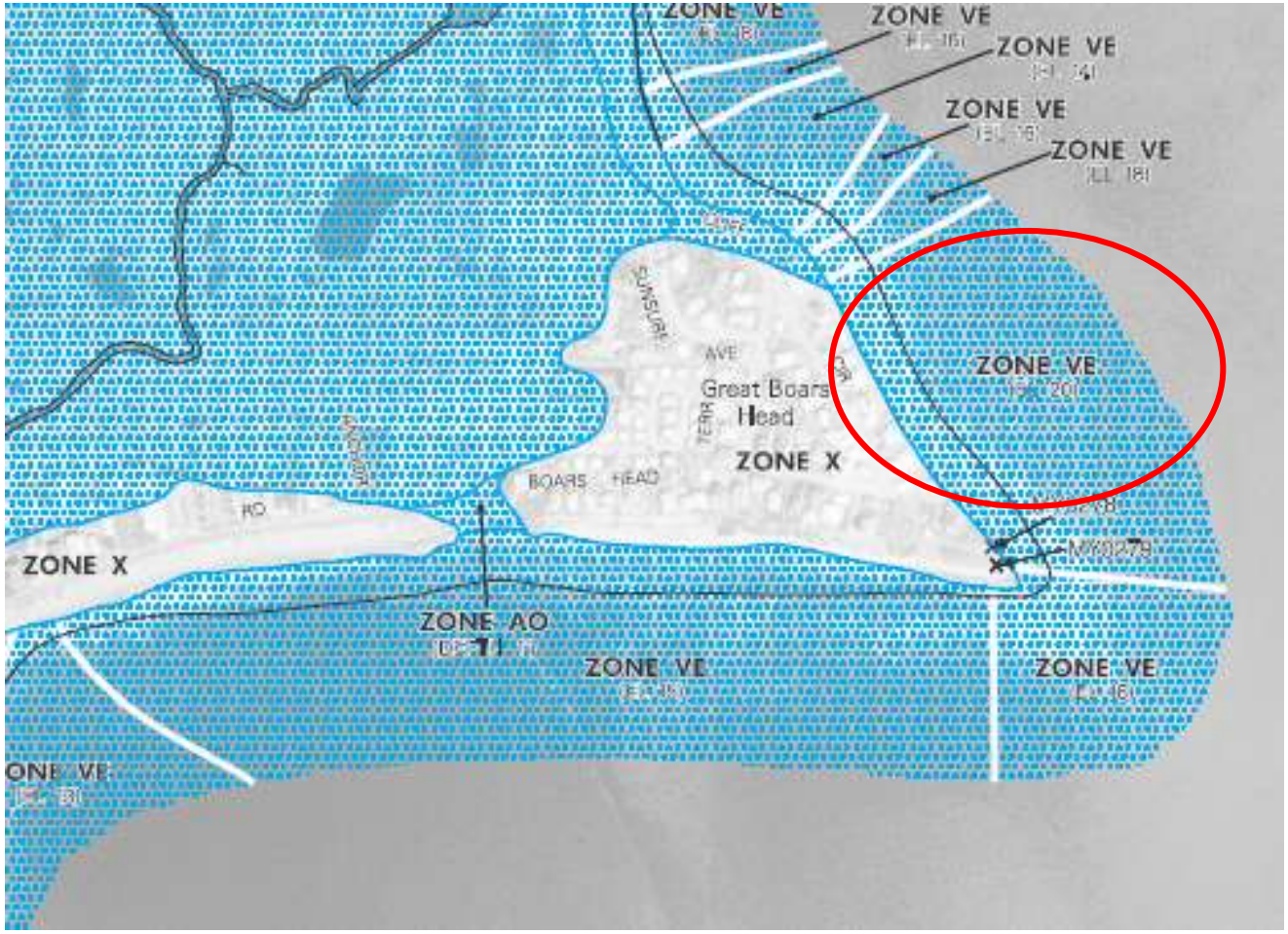
Time Period	Flood Size			
	10-year	25-year	50-year	100-year
1 year	10%	4%	2%	1%
10 years	65%	34%	18%	10%
20 years	88%	56%	33%	18%
30 years	96%	71%	45%	26%
50 years	99%	87%	64%	39%

Source: ASFPM

Flood Insurance Rate Map Zones (partial listing)

Zone	Description
A	100-year flood hazard zone with no BFE determined
AE	100-year flood hazard zone with BFE determined
AH	100-year flood hazard zone with flood depths of 1-3 ft.; BFE determined
AO	100-year flood hazard zone with flood depths of 1-3 ft.; average depths determined
X (shaded)	Riverine/coastal floodplain areas between the 100-year flood and 500-year flood
X (unshaded)	Outside of the limits of the 500-year flood
V	Coastal high hazard areas (100-year flood and wave effects of 3 ft. or greater); no BFE determined
VE	Coastal high hazard areas (100-year flood and wave effects of 3 ft. or greater); BFE determined

Flood Insurance Rate Map



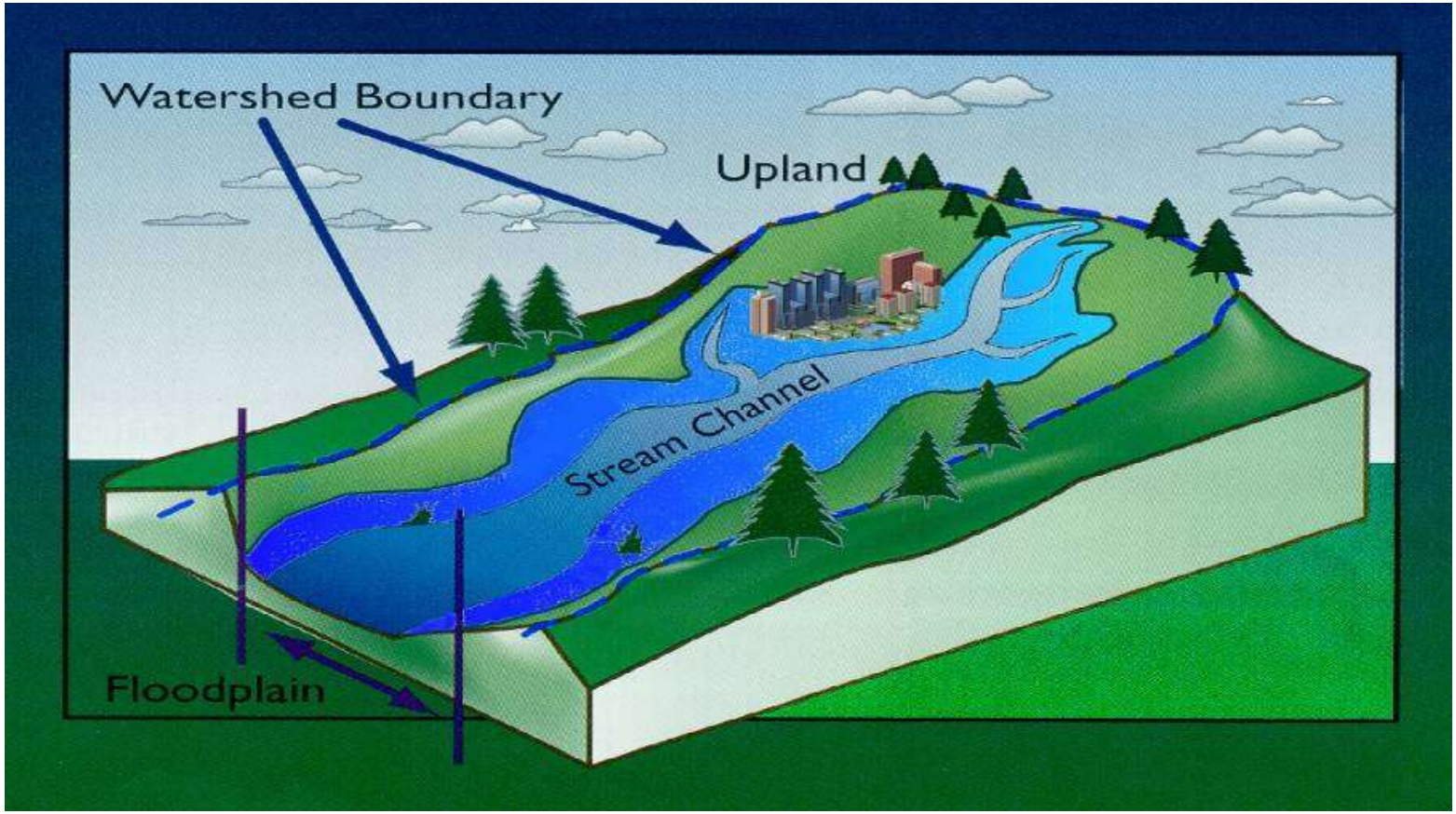
Mapping Methodologies

Riverine Studies:

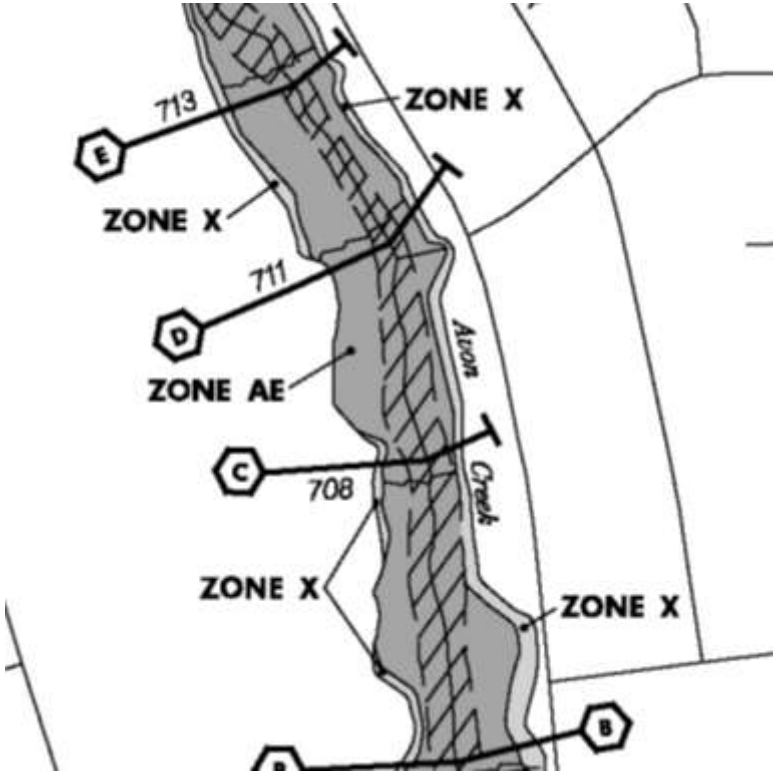
- Enhanced (or detailed) study – Zone AE
- Basic study (model-backed, approximate methods) – Zone A
- Revisions due to updated topographic data

Coastal Studies

Mapping Riverine Floodplains: Zone AE Enhanced Study

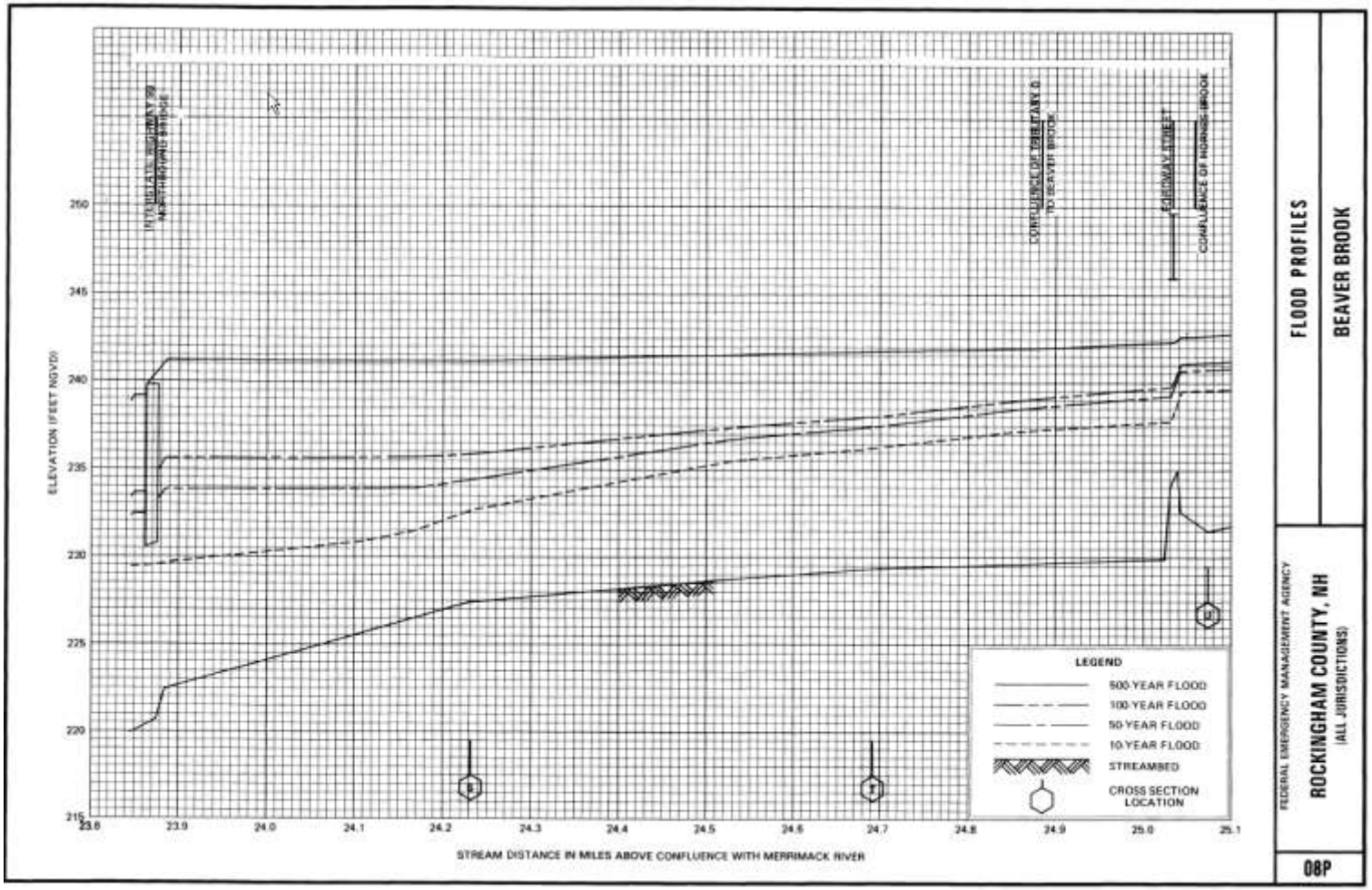


Mapping Riverine Floodplains: Zone AE Enhanced Study

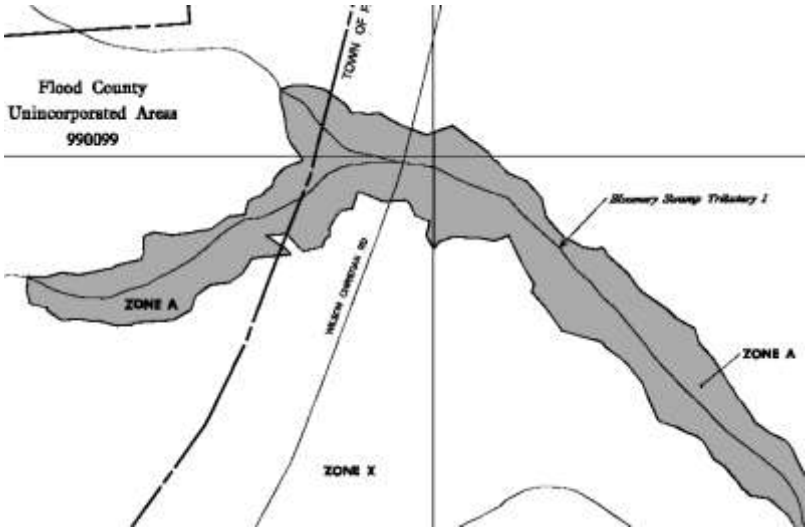


- Traditional detail study
- Sections field surveyed
- All hydraulic structures surveyed
- Detailed hydrologic analysis
- Traditional mapping
  - Floodways
  - Floodway Data Table
  - Flood Profile

Flood Profiles

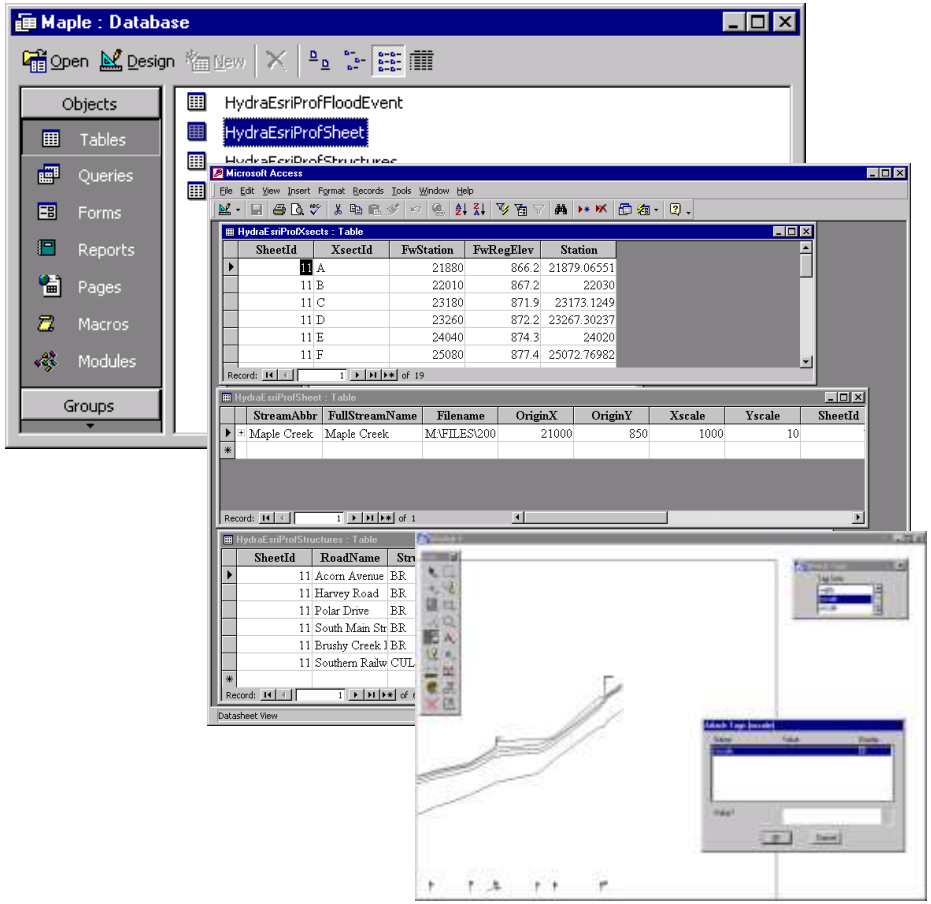


Mapping Riverine Floodplains: Zone A Basic Study



- Replaces Unnumbered A Zones
- Much more automated approach
- Hydrology from Regional Equations
- Hydraulic Models Developed
- Flood boundaries mapped from model output

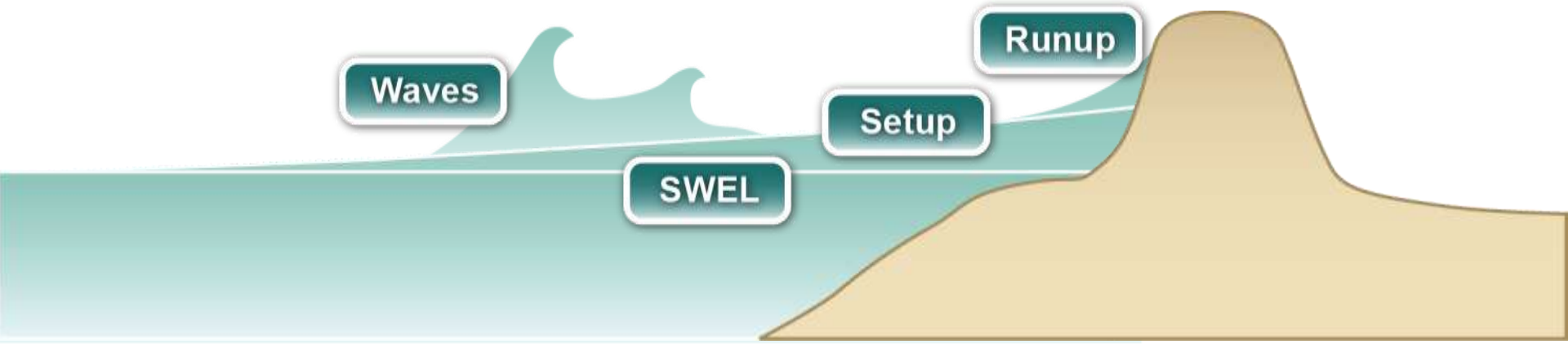
Mapping Riverine Floodplains: Revisions due to Updated Topography



- Used to Update Effective Mapping with new Terrain Data
- Foundation is the FEMA Profile

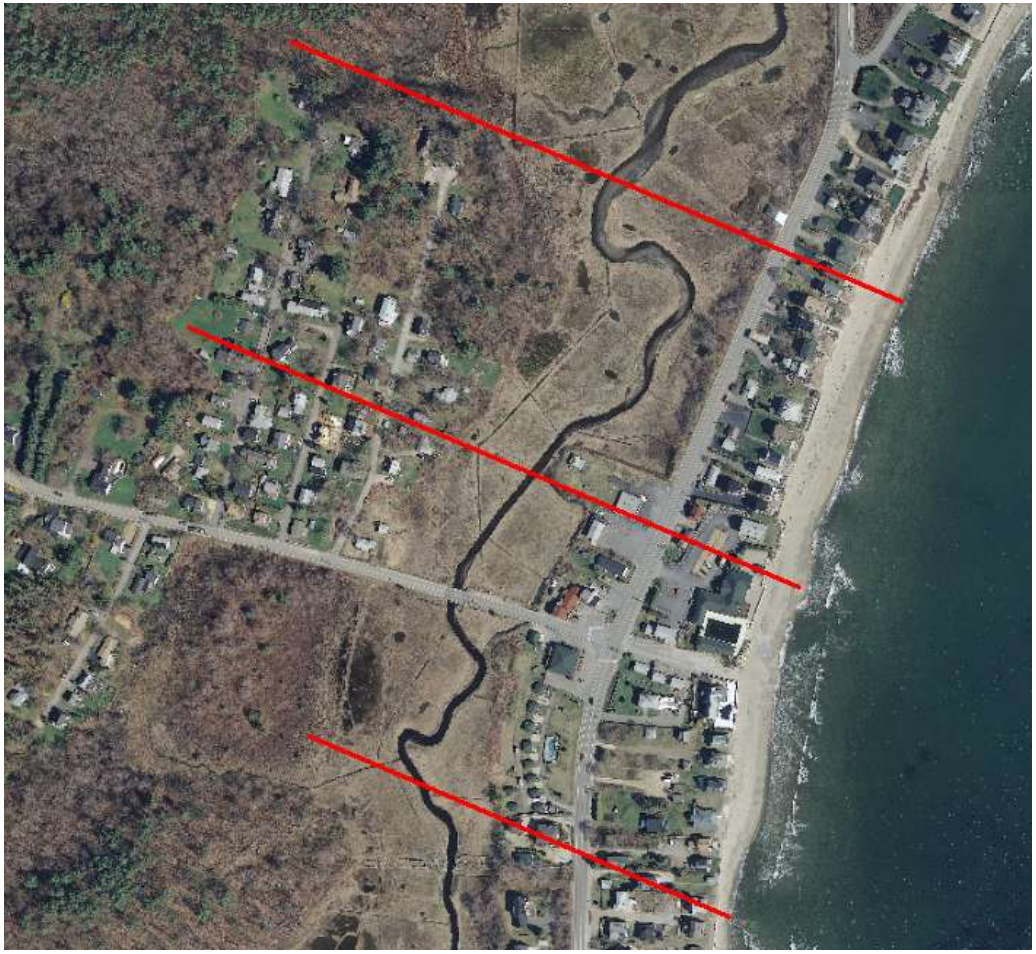
Coastal Methods: Components to Base Flood Elevation

1. Storm surge stillwater elevation (SWEL)
2. Amount of wave setup
3. Wave height above storm surge (stillwater + setup) elevation
4. Wave runup above storm surge elevation (where present)



Coastal Methods: Field Reconnaissance

- Observe features that cannot be seen from imagery
  - Classify terrain
  - Identify raised buildings
  - Determine vegetation density
- Reality check for model results

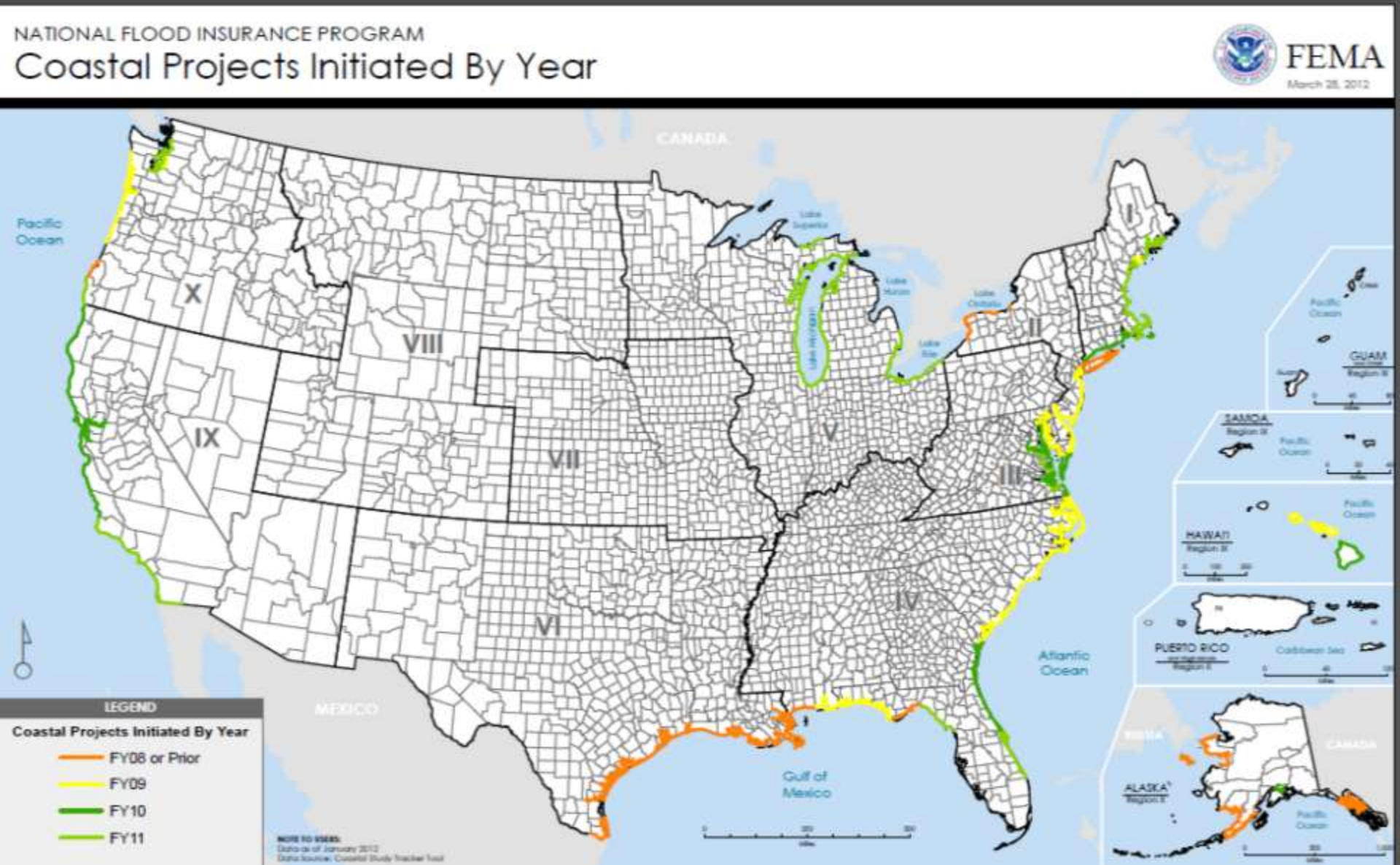


Risk MAP (Mapping, Assessment, and Planning) Vision

Vision Statement:

With State, Local, Tribal, Non-Profit and Private-Sector collaboration, Risk MAP delivers quality data that increases public awareness and leads to action that reduces risk to life and property

Coastal Map Updates Underway



NH Coastal Project Footprint

Study Type

	Flooding Source	Study Type: Coastal	Zone A/ Basic Study	Zone AE/ Enhanced Study	Revisions due to updated topographic data
1	Atlantic Ocean	17.7			
2	Piscataqua River				13.1
3	Great Bay shoreline				32.0
4	Squamscott River			0.8	5.0
5	Exeter River			7.53	0.5
6	Lamprey River			4.5	
7	Little River No. 1 (Exeter)				2.3
8	Pickering Brook				1.8
9	Piscassic River				3.4
10	Bellamy River				2.6
11	Cocheco River				2.3
12	College Brook				1.7
13	Oyster River			3.75	
14	Hamel Brook/Longmarsh Brook				1.1
15	Pettee Brook				1.3
16	Winnicut River				3.7
17	Woodman Brook				1.2
Zone A restudies			136.4		
Total		17.7	136.4	16.58	72.0

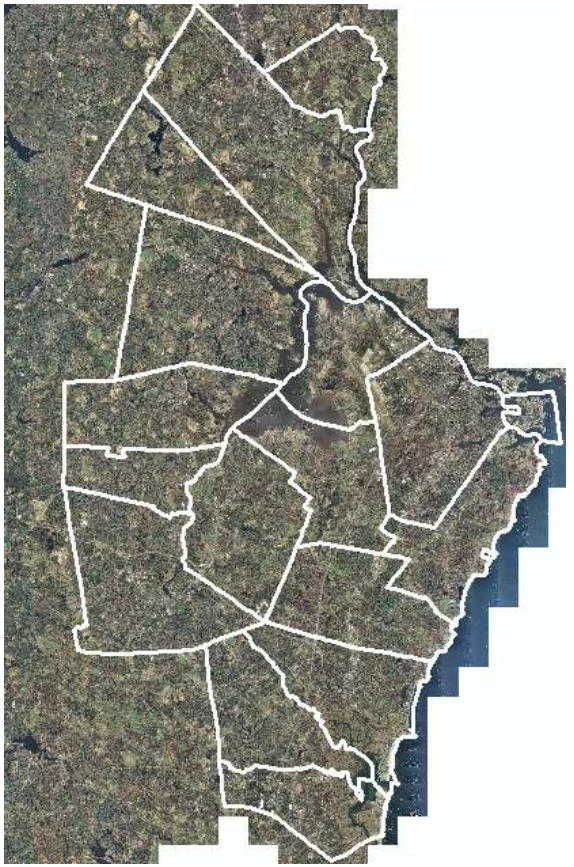
All distances reported in miles. Distances reflect Coordinated Needs Management Strategy (CNMS) results for the study area.

Project Partners

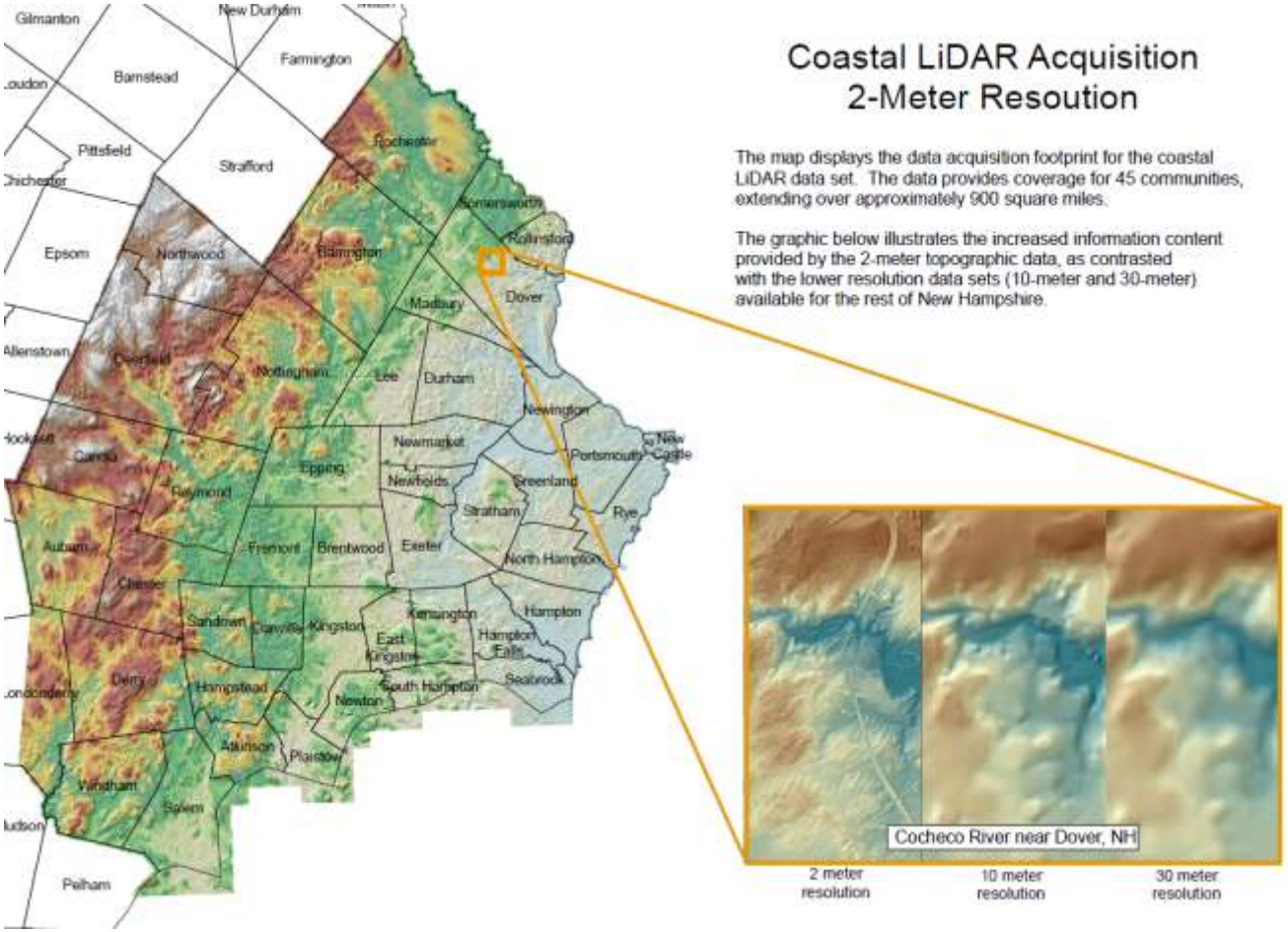
Role	Partner
Project Management	UNH
Riverine Analysis – H&H Modeling	USGS Water Resources Center (Pembroke)
Coastal Analysis	AECOM (Boston)
Database Compilation, DFIRM/FIS Production	UNH
Outreach	NH Office of Energy and Planning
Non-Regulatory Products	UNH, AECOM

NH Coastal Project: Best Available Data

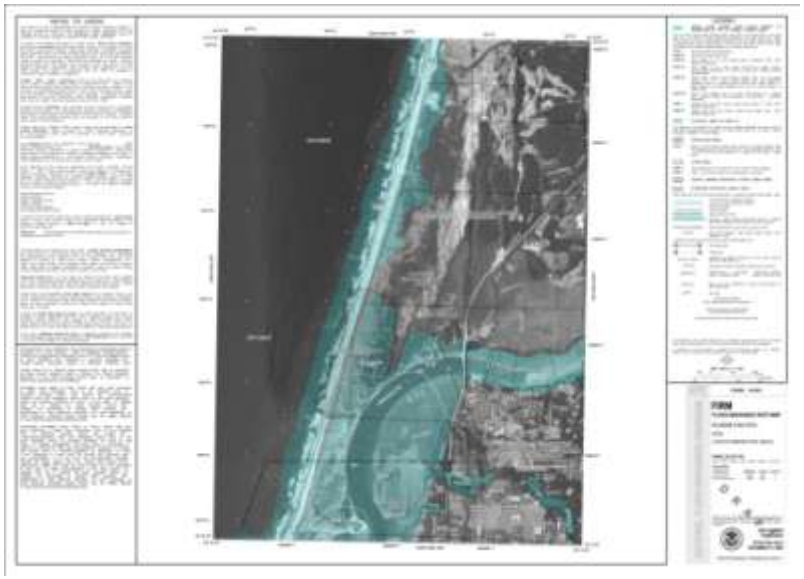
- 2010 1-ft. Orthophotography
- Coastal LiDAR – 2 meter Digital Elevation Model; 30 cm vertical accuracy
- Field Data Collection

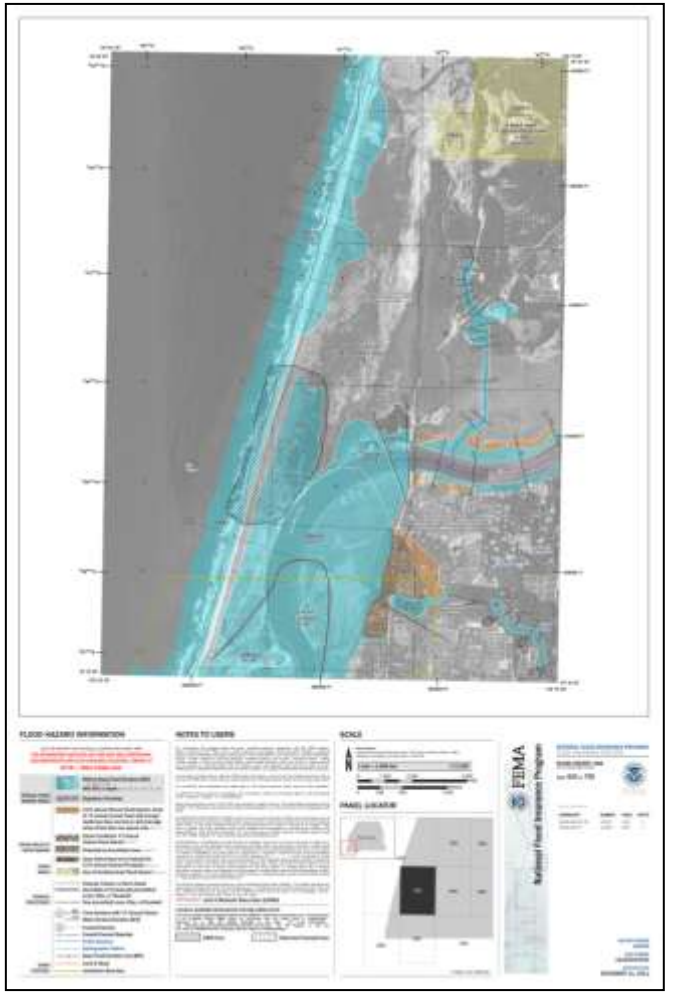


Mapping Riverine Floodplains: Revisions due to Updated Topography

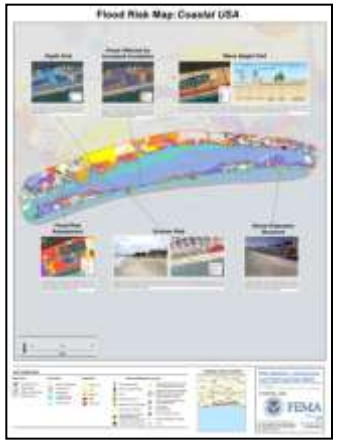


Regulatory Products: FIS and DFIRMs





Coastal Nonregulatory Products:
1. Flood Risk Map and Report

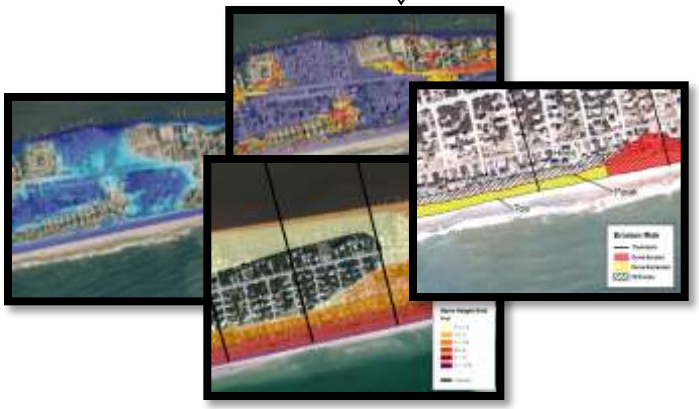


Flood Risk Map

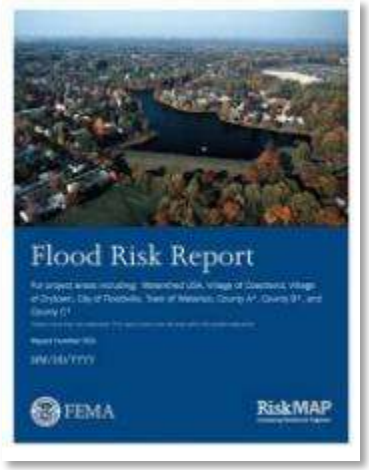
Flood Risk Database

Flood Risk Assessment Data
Flood Depth & Analysis Grids

Changes Since Last FIRM Data
Areas of Mitigation Interest

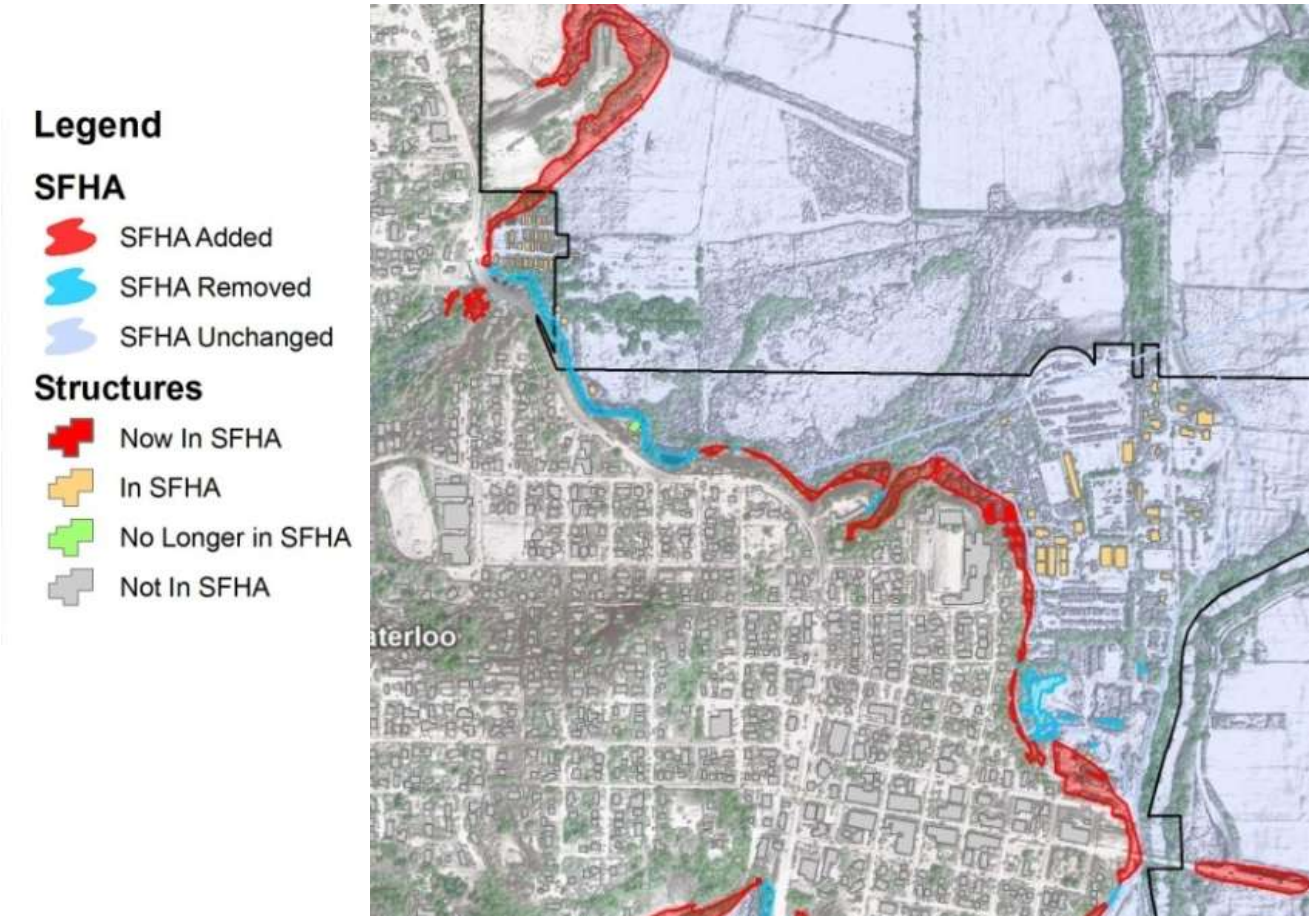


Ad-Hoc Flood Risk Analyses



Flood Risk Report

2. Changes Since Last FIRM

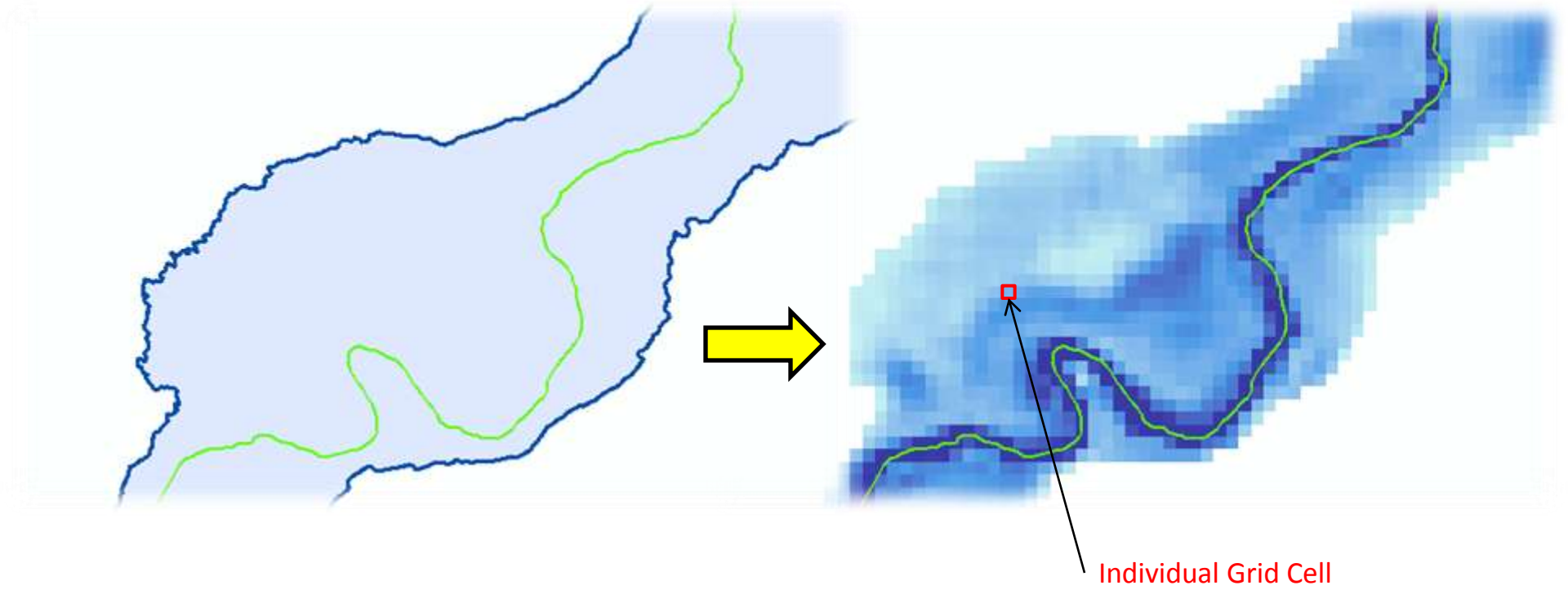


3,4. Riverine/Coastal Depth Grids

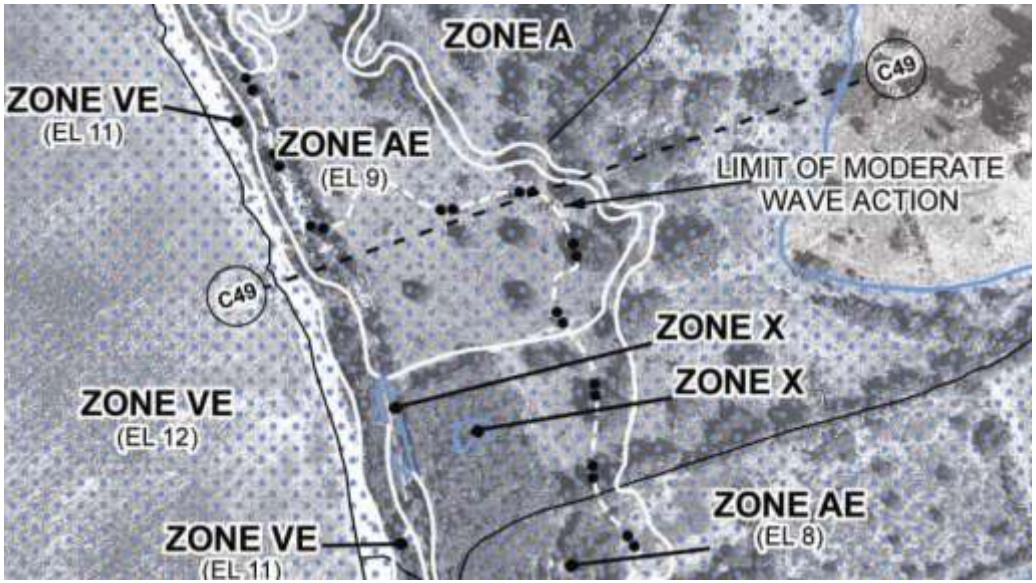
- Each Grid Cell has a Unique Value

FIRM 1% Annual Chance (100-yr) Floodplain

1% Annual Chance Depth Grid



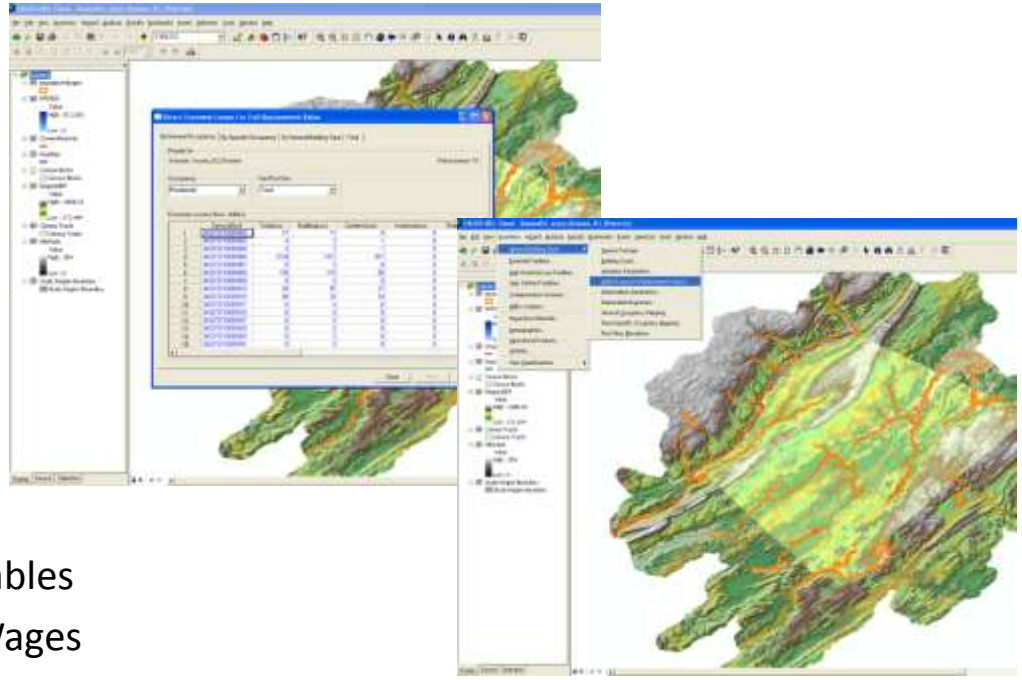
5. Limit of Moderate Wave Action (LimWA)



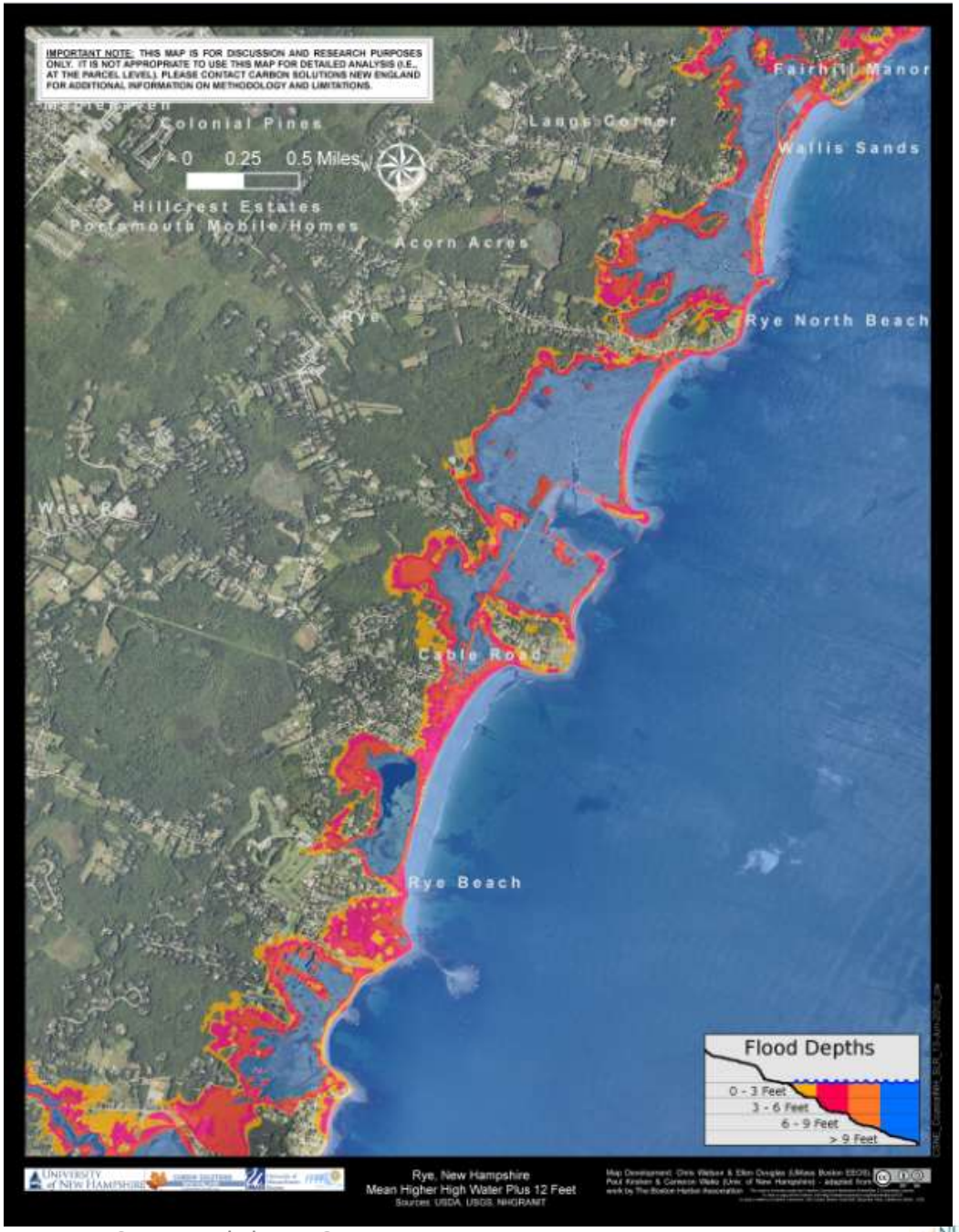
- Areas subject to wave heights greater than 1.5 feet
- Coastal A Zone

6. Hazus MH Analysis

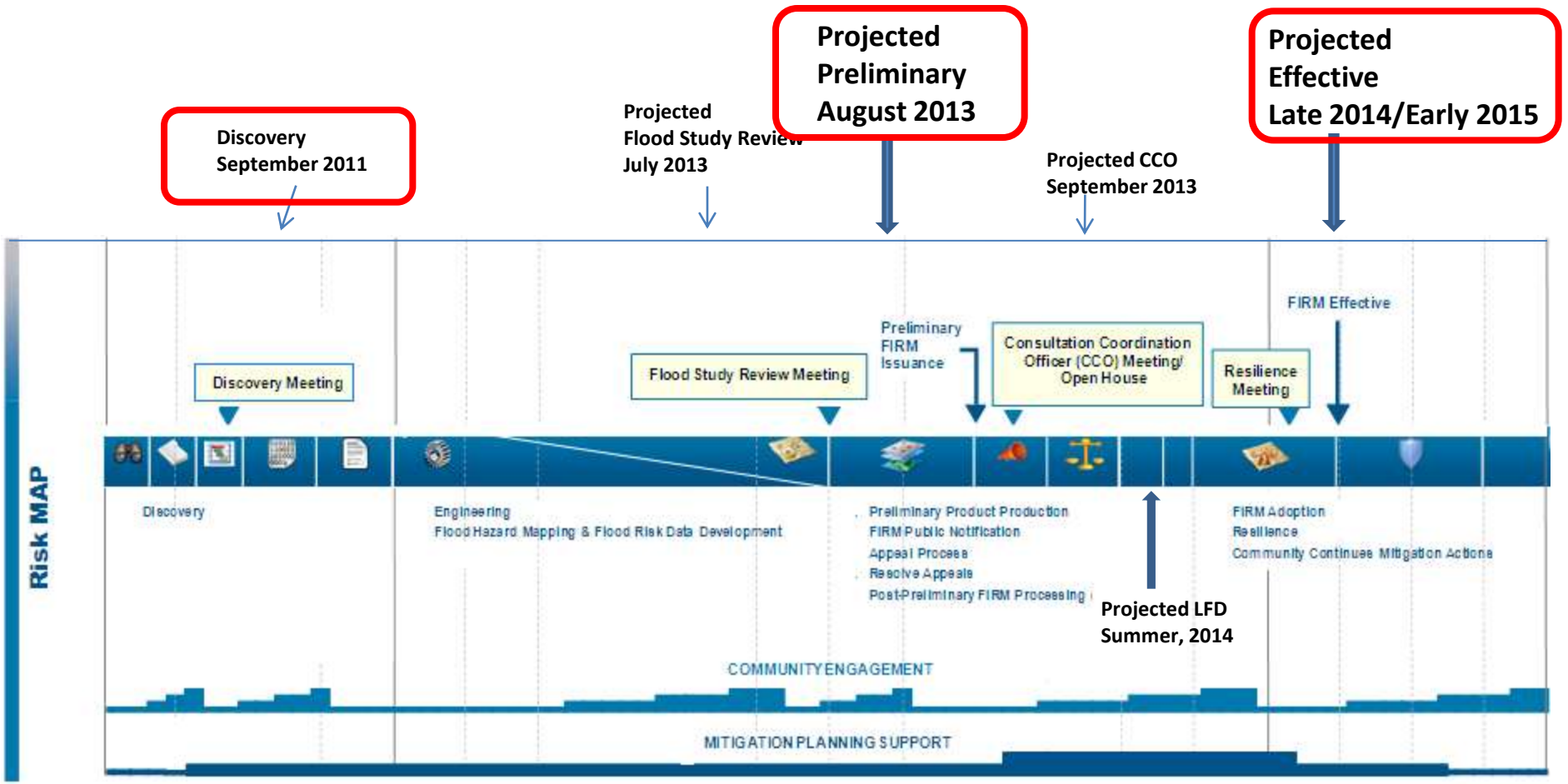
- Dollar Losses
  - Residential Loss
  - Commercial Loss
  - Other Asset Loss
- Percent Damage
  - Evaluates Building Stock
  - Structure and Contents
- Business Disruption
  - Considers Total Occupancy Tables
  - Considers Lost Income and Wages
- Social Impacts
  - Estimates Displaced Households
  - Anticipated Shelter/Hospitalization Requirements



7. Sea Level Rise Analysis



NH Coastal Project Timeline



Finding the Maps/Data

- **FEMA Map Store** (www.msc.fema.gov) for viewing, printing a FIRMette, and purchase of digital data only

- **NH GRANIT** (www.granit.unh.edu/dfirms) for DFIRMs: on-line viewing of pdf copies maps and studies, free download of GIS data, and purchase of paper copies

- **GRANITView** (http://granitview.unh.edu) for interactive mapping of floodplain data

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Home

Welcome to the New Hampshire GRANIT Flood Insurance Study (FIS) and Digital Flood Insurance Rate Maps (DFIRMs) repository. The purpose of this site is to disseminate digital versions (pdfs) of the FEMA (Federal Emergency Management Agency) FIS and DFIRM panels to the public. We anticipate having all New Hampshire countywide FIS and DFIRMs (preliminary and/or effective) available for viewing and downloading.

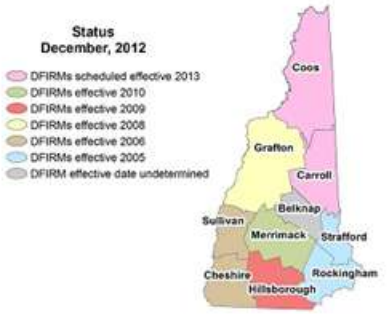
GRANIT is pleased to announce that the effective FIS and DFIRMs for Cheshire, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan Counties are now available through this website. In addition, the preliminary FIS and DFIRMs are available for Carroll and Coos Counties. The NH Floodplain Management Program at the NH Office of Energy and Planning has developed helpful fact sheets for Carroll County and Coos County that inform communities about important facts and dates related to the preliminary products.

Previously, FEMA created paper versions of the Flood Insurance Rate Maps for individual communities. As part of its Map Modernization activities, FEMA and its mapping partners are now creating digital, seamless, countywide products. These improved products incorporate updated base maps, letters of map change (LOMCs), and revised studies (where conducted). In addition, their digital format will allow for more efficient and timely future map updates.

The Flood Insurance Study tab links you to digital versions of countywide Flood Insurance Study documents.

The DFIRMs tab allows you to access the formatted map panels.

Related Links is a list of project participants and helpful links.



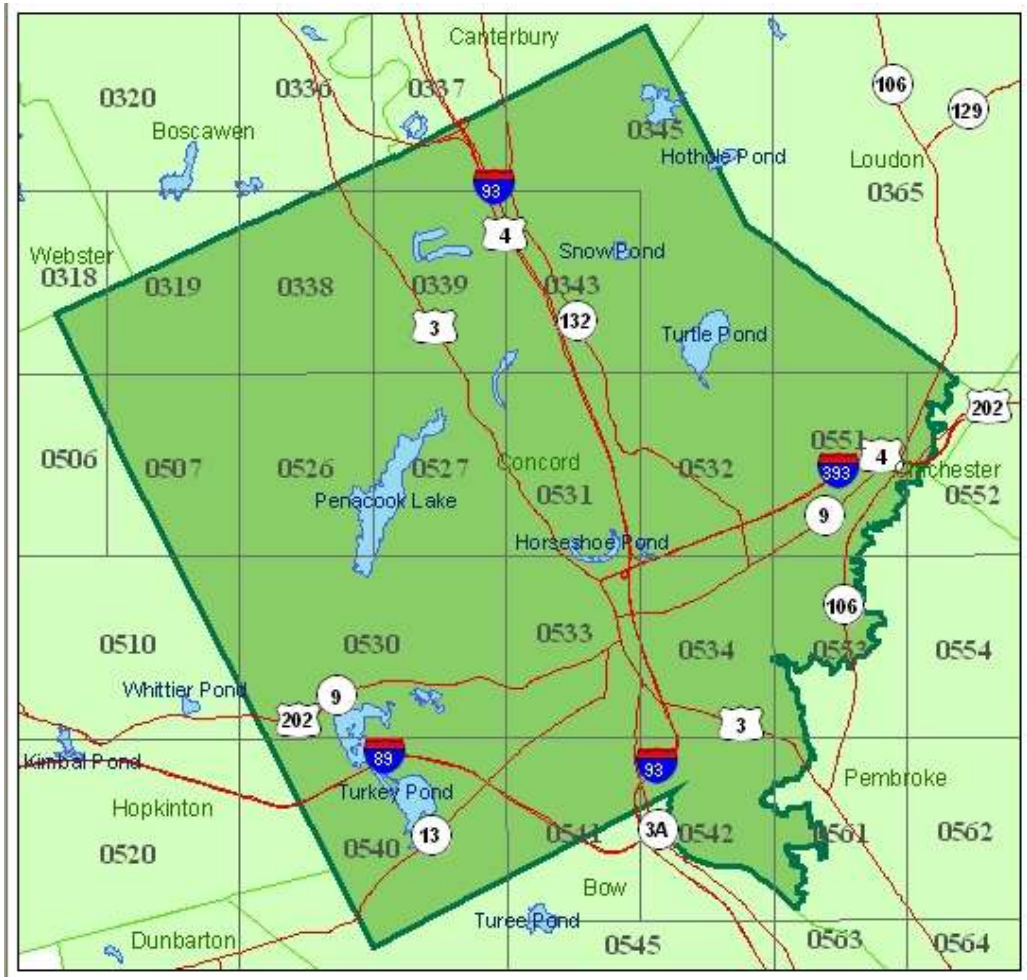
For information on New Hampshire's involvement in the National Flood Insurance Program (NFIP), please visit the NH Office of Energy and Planning website.

BE FLOOD ALERT — NATIONAL FLOOD INSURANCE PROGRAM

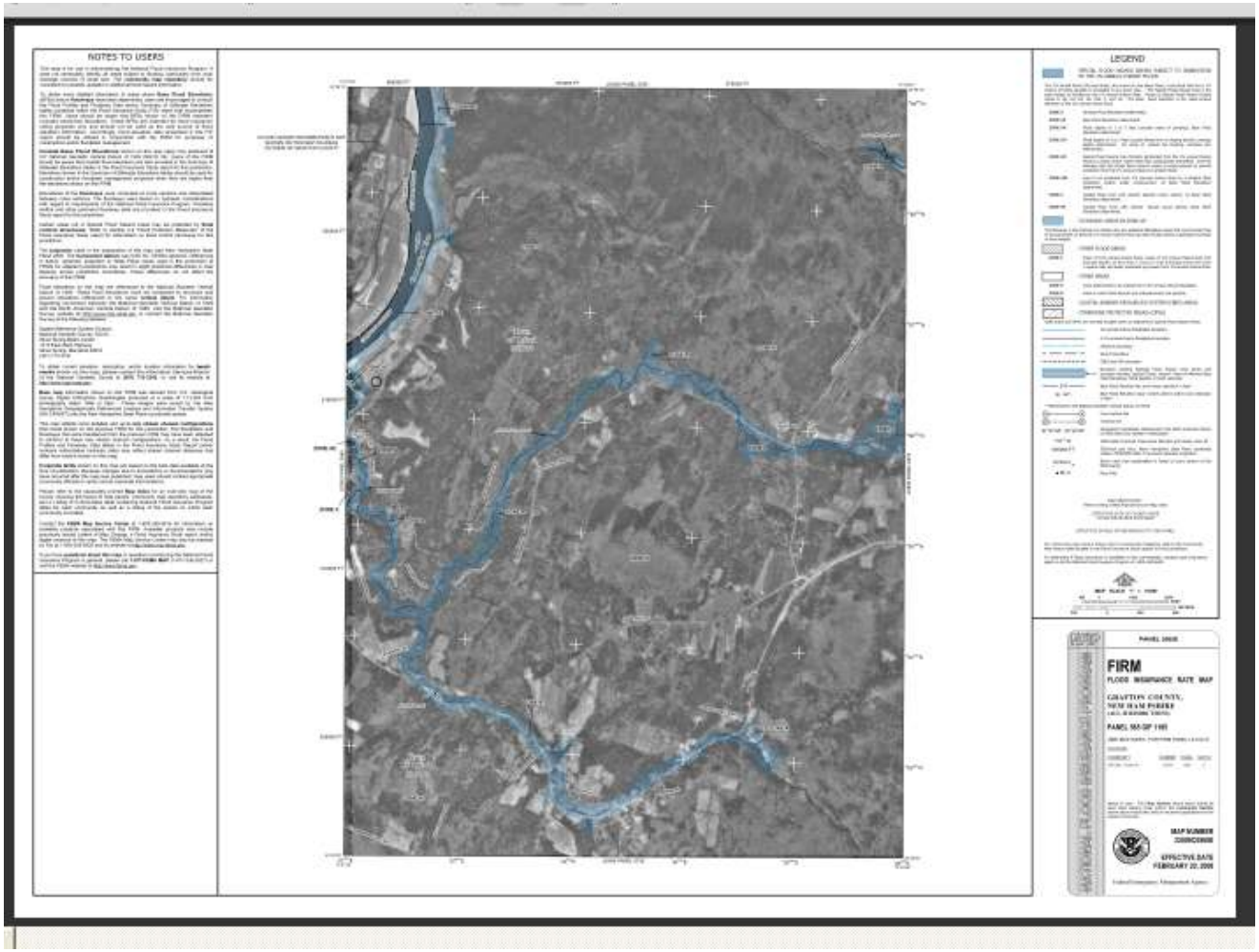
If you have questions about the FIS report or the DFIRM content, please contact the Director of Federal Insurance and Mitigation Division, FEMA Region 1 in Boston at (617) 956-7573.

If you have questions on the DFIRM adoption process, please contact Ms. Jennifer Gilbert, NH NFIP State Coordinator.

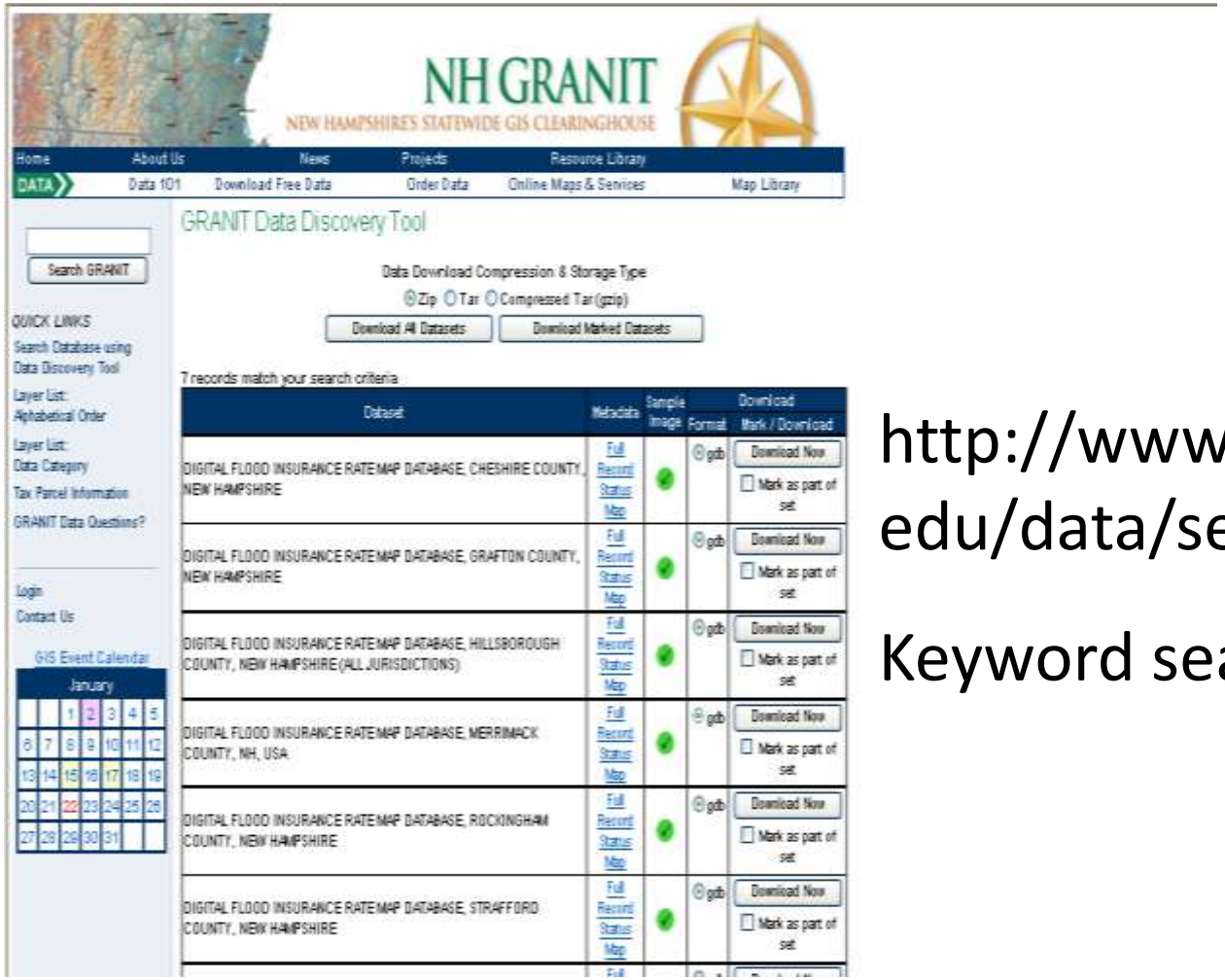
Community Index Map



PDF Copies of Entire Panel Available



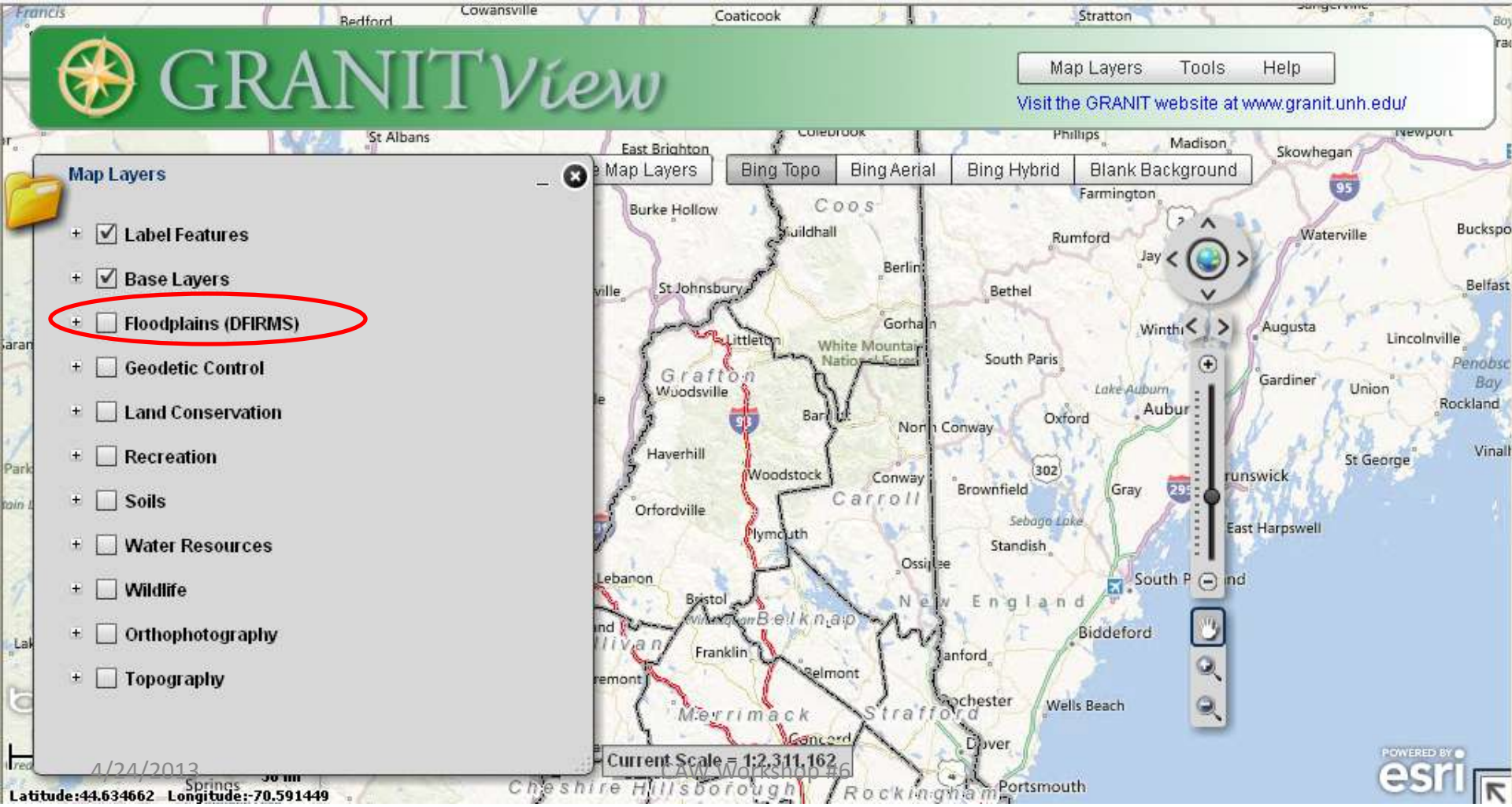
Accessing the GIS Data



http://www.granit.unh.edu/data/search

Keyword search: flood

GRANITView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Blank Background
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Base Layers
Floodplains (DFIRMS)
Geodetic Control
Land Conservation
Recreation
Soils
Water Resources
Wildlife
Orthophotography
Topography
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Latitude:44.634662 Longitude:-70.591449
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GRANITView


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Bing Topo
Bing Aerial
Bing Hybrid
Blank Background
Rockingham
bing
50 m
200 ft
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Latitude:42.957571 Longitude:-70.929910

QUESTIONS?

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