Overview of the National Flood Insurance Program (NFIP) and Recent Flood Mapping Efforts

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National Flood Insurance Program (NFIP)

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What is the NFIP?

- The National Flood Insurance Program:
  - Was established by the National Flood Insurance Act of 1968
  - Is a voluntary program
  - Requires a legal agreement between FEMA and a community
  - Makes flood insurance available to all residents of communities that meet floodplain management requirements

Elements of the NFIP

- Insurance
- Mapping
- Regulations

Insurance backed by the Federal government is made available to residents of communities that participate in the NFIP

Participating communities must regulate development within mapped flood zones to meet minimum NFIP requirements

NFIP Flood Insurance

- Insurance available to ALL residents of a participating community (very limited exceptions)
- Coverage is available for building and contents (separate coverages)
- Building coverage is mandatory within special flood hazard area as condition of Federal-backed mortgage

Flood Insurance Facts

- Coverage limits (building/contents)
  - Residential: $250,000 / $100,000
  - Non-Residential: $500,000 / $500,000
- All overland flooding is covered
- Coverage limitations apply to basement areas
- Premiums depend on age of structure, flood zone, and height of lowest floor

Flood Insurance Facts - MA

- Nearly all communities participate
  - Only 14 of 351 MA communities do not
  - All but 1 of those are in four western counties
- Approximately 60,000 policies in force
  - Provides $14.2 billion in coverage
  - Average annual premium of $1,230
  - National average premium is $679
- Nearly 24,600 claims paid since 1978
  - $345 million in total claims paid
  - Average claim payment of $14,000

Flood Insurance – Mandatory Purchase

- Federal law requires lenders to require a property owner to purchase and maintain flood insurance on structures located within a SFHA as condition of loan
- “Loan” also includes reverse mortgage, home equity loan, home equity line of credit, etc.
- Required on any loan with “Federal involvement” and can apply at any time in term of the loan
- Lenders can (and are sometimes encouraged to) place more stringent requirements
- Flood insurance can also be required as a condition of other forms of Federal assistance (disaster assistance, government loans, etc.)

Flood Insurance Studies and Maps

- FEMA produces Flood Insurance Studies (FIS) and Flood Insurance Rate Maps (FIRMs) for the National Flood Insurance Program (NFIP)
- The FIS and FIRMs:
  - identify the areas where communities must regulate development in accordance with the minimum floodplain management requirements of the NFIP
  - are used to determine where flood insurance is required as a condition of a federally insured loan
  - are used to determine flood insurance premiums
  - are also used by a number of programs outside of the NFIP

MA Regulations Used to Meet Requirements of 44 CFR 60.3

- Massachusetts State Building Code
  - 780 CMR, 8th Edition, Base and Residential Volumes
- Wetlands Protection Act Regulations
  - 310 CMR 10.00, Wetlands Protection Regulations
  - 310 CMR 13.00, Inland Wetlands Restrictions
  - 310 CMR 12.00, Coastal Wetlands Restrictions
- Septic System Regulations
  - 310 CMR 15, Title 5, Minimum Requirements for the Subsurface Disposal of Sanitary Sewage
- Local Ordinance or Other Regulation

FEMA Flood Maps: Can't Live With 'Em; Can't Live Without 'Em

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NATIONAL FLOOD INSURANCE PROGRAM

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  - are used to determine flood insurance premiums

Flood Insurance Studies and Maps

- The NFIP defines the land area subject to inundation by the Base Flood (also known as *one percent chance flood* or *100-year flood*) as the "Special Flood Hazard Area"
- The Base Flood has a one percent chance of being equaled or exceeded in any year, based on current conditions
- 100-year floodplain is identified on FIRM as A zone [A, AE, A1-30, AH, AO, AR] or V zone [V, VE, V1-30]

Flood Zone Definitions

- **Zone VE (V1-30) – Areas of 100-year coastal flood with velocity**
  - Wave height 3 feet or greater
  - Wave runup depth 3 feet or greater
  - Within primary frontal dune (seaward of landward toe of dune)
- **Zone AE (A1-30) – Areas of 100-year flood; flood elevations**
  - May be coastal or riverine
  - Coastal can contain up to 2.9 feet wave height
  - Coastal flood elevations at top of wave envelope
- **Zone AO – "Overwash" areas with flow depths of 1 to 3 feet**
  - Generally coastal with sloping ground
  - Flow velocities can vary greatly
  - Flow paths are typically not well defined
- **Zone A – Areas of 100-year flood; NO flood elevations given**
- **Shaded Zone X (B) – Areas of 500-year flood**
- **Unshaded Zone X (C) – "Areas of minimal flooding"**

FLOOD INSURANCE STUDIES

- The NFIP defines the land area subject to inundation by the Base Flood as the "Special Flood Hazard Area"

- How are Base Flood Elevations and floodplain boundaries determined?

Components of Flood Insurance Study

- Hydrologic study

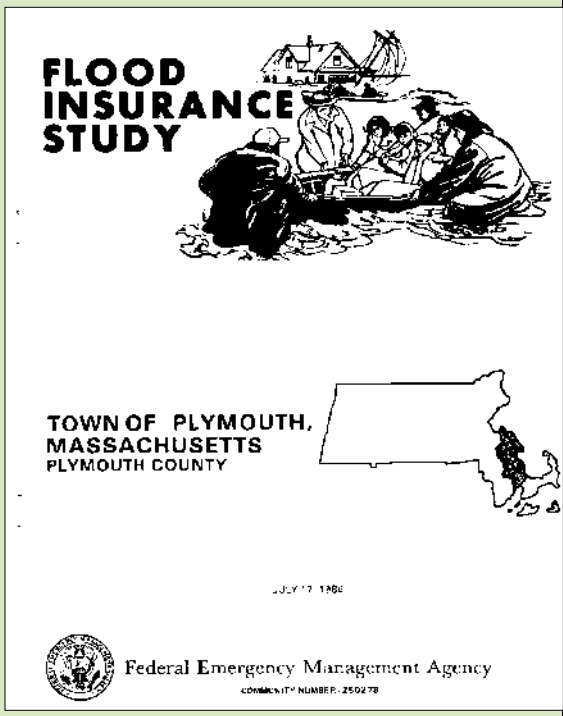
  How much water will there be?

- Hydraulic study

  How high will the water get?

- Topographic analysis

  What areas will the water cover?



Hydrologic Study

How much water will there be?

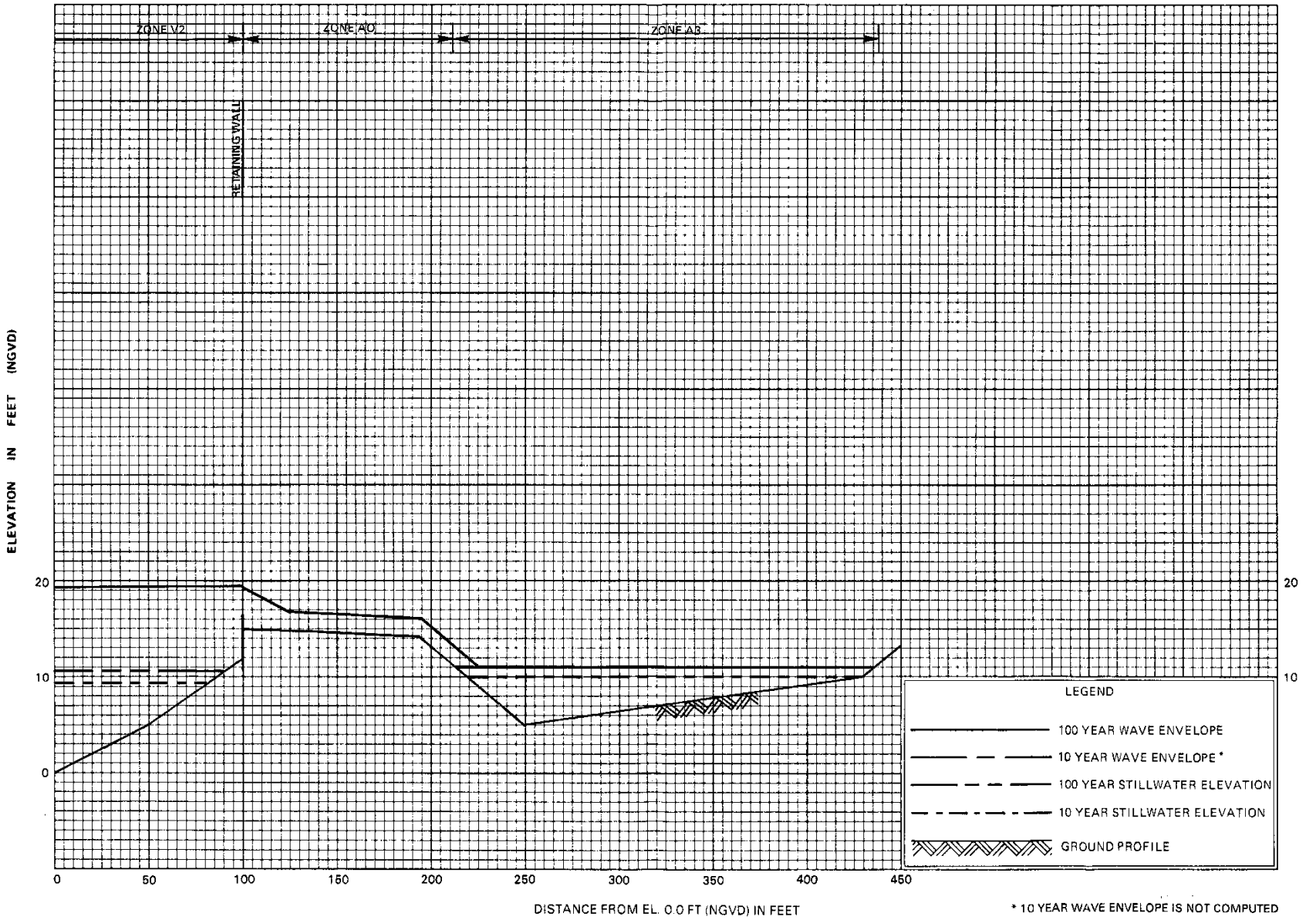
TABLE 7 – SUMMARY OF DISCHARGES - continued

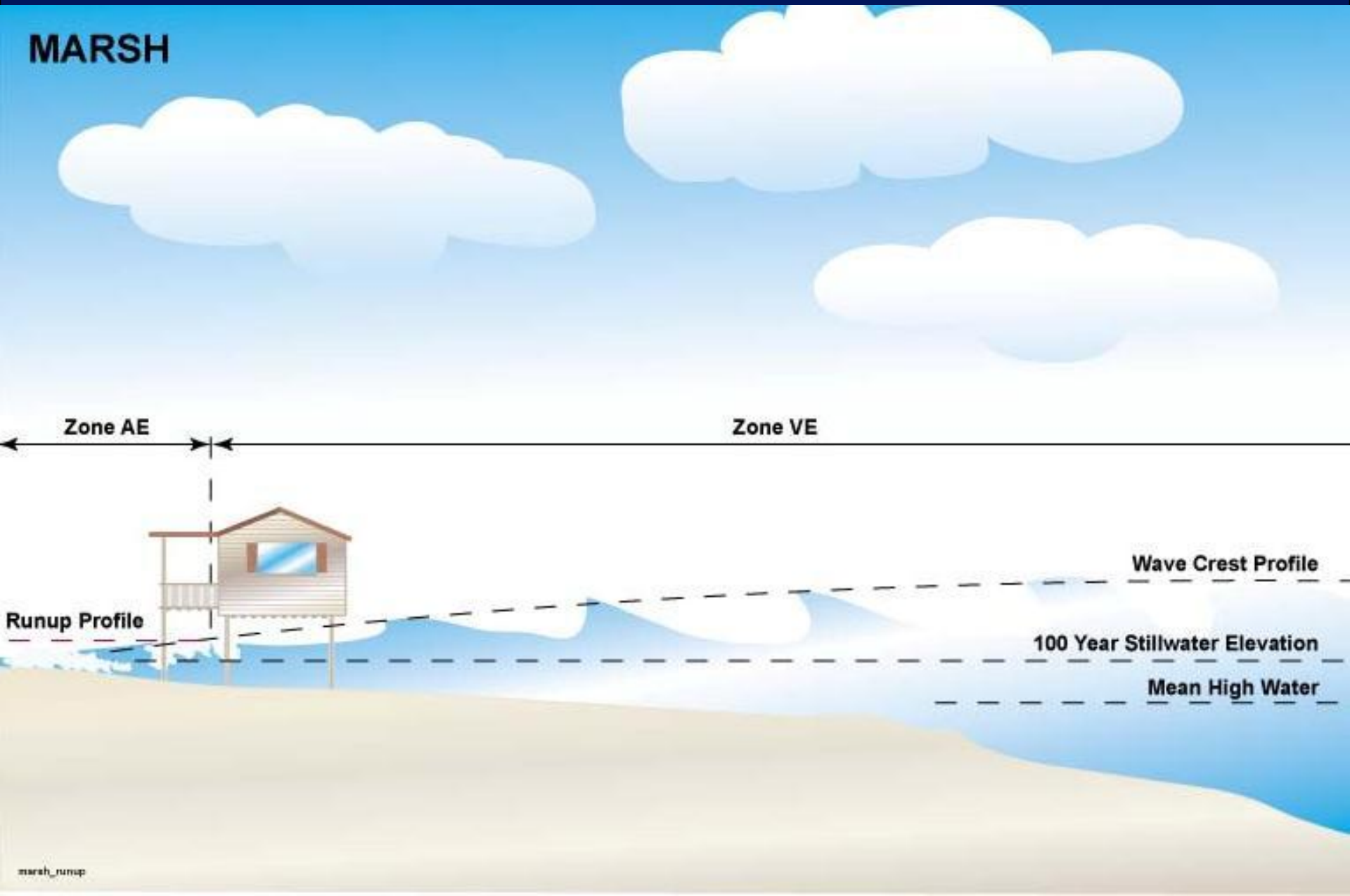
FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQUARE MILES)	PEAK DISCHARGES (CUBIC FEET PER SECOND) 10-PERCENT ANNUAL CHANCE	2-PERCENT ANNUAL CHANCE	1-PERCENT ANNUAL CHANCE	0.2-PERCENT ANNUAL CHANCE
BUTTONWOOD BROOK					
Location 1* in Dartmouth	3.10	300	495	595	800

TABLE 13 – SUMMARY OF REVISED STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet NAVD) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT*
BUZZARDS BAY				
Nasketucket Bay	6.8	10.4	12.2	15.8
West Island	6.7	10.2	12.0	15.7
Harbor View/Pope Beach	6.6	10.1	11.9	15.5

Hydraulic Study - *How high will the water get?*



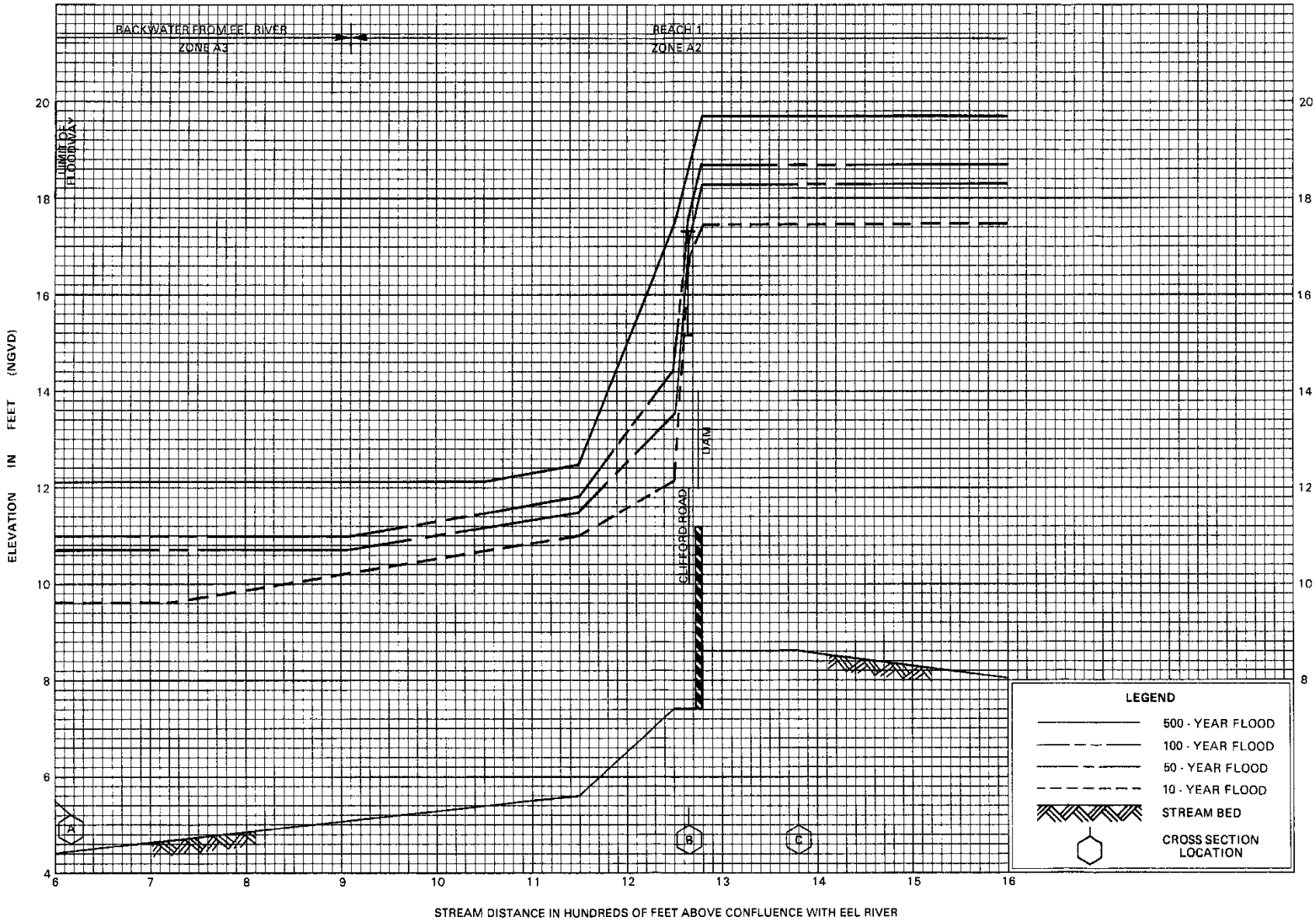

MARSH
Zone AE
Zone VE
Wave Crest Profile
Runup Profile
100 Year Stillwater Elevation
Mean High Water
marsh_runup

Hydraulic Study - *How high will the water get?*

TABLE 10 - COUNTYWIDE TRANSECT DESCRIPTIONS

TRANSECT	LOCATION	ELEVATION (feet NAVD 88[1]) 1-PERCENT-ANNUAL-CHANCE STILLWATER	ELEVATION (feet NAVD 88[1]) MAXIMUM 1-PERCENT ANNUAL CHANCE WAVE CREST[2]
1	From 30 feet north of Beacon Street extending east approximately 315 east of the Town of Salisbury corporate limit lines	8.3	18.0
2	From Twelfth Street extending northeast to approximately 258 feet east of the Town of Salisbury corporate limit lines.	8.3	19.0
3	From 542 feet north of Liberty Street extending east 176 feet east of the Town of Salisbury corporate limit lines.	8.3	20.0

Hydraulic Study - *How high will the water get?*



FLOOD PROFILES

BRANCH OF EEL RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF PLYMOUTH, MA

(PLYMOUTH CO.)

09P

Hydraulic Study - *How high will the water get?*

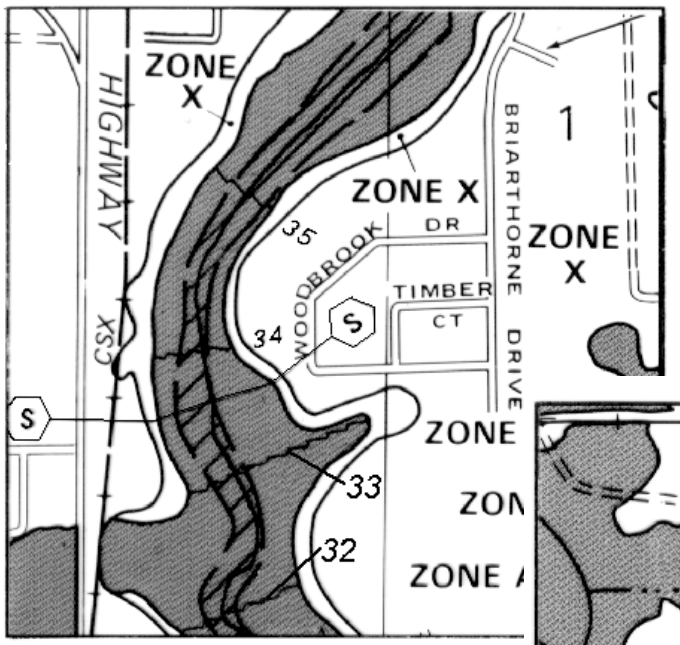
TABLE 8 - PRECOUNTYWIDE SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet NAVD 88) 10-PERCENT	2-PERCENT	1-PERCENT	0.2-PERCENT
CEDAR POND				
In Lynn	98.2	*	109.7	*
FLAX POND				
In Lynn	54.2	*	54.8	*
LAKE ATTITASH				
Entire shoreline within Amesbury/Merrimac	96.9	97.2	97.3	98

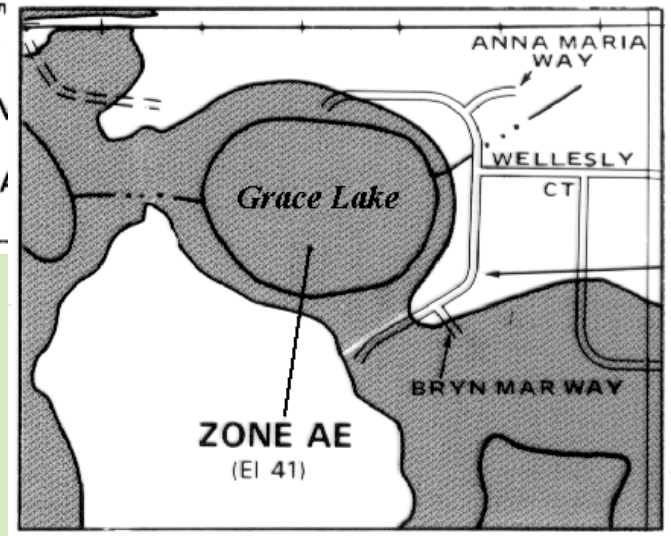
* Data not available

Topographic Analysis

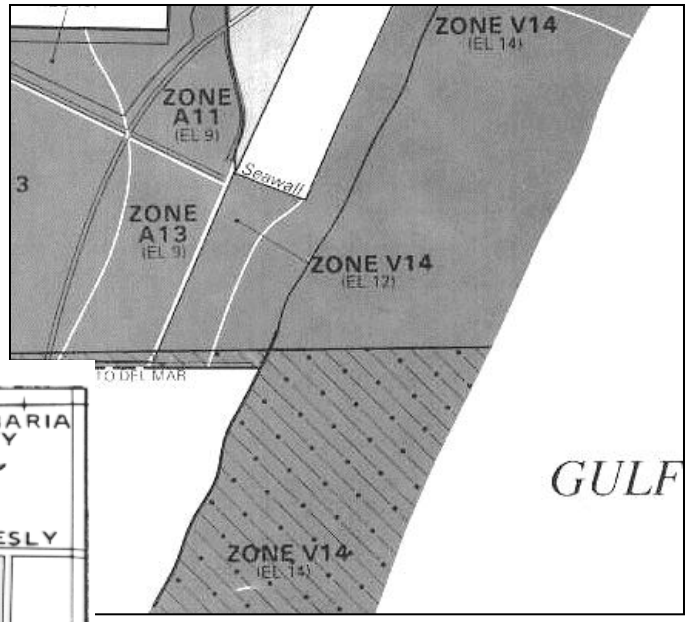
What areas will the water cover?



River



Lake



Coast

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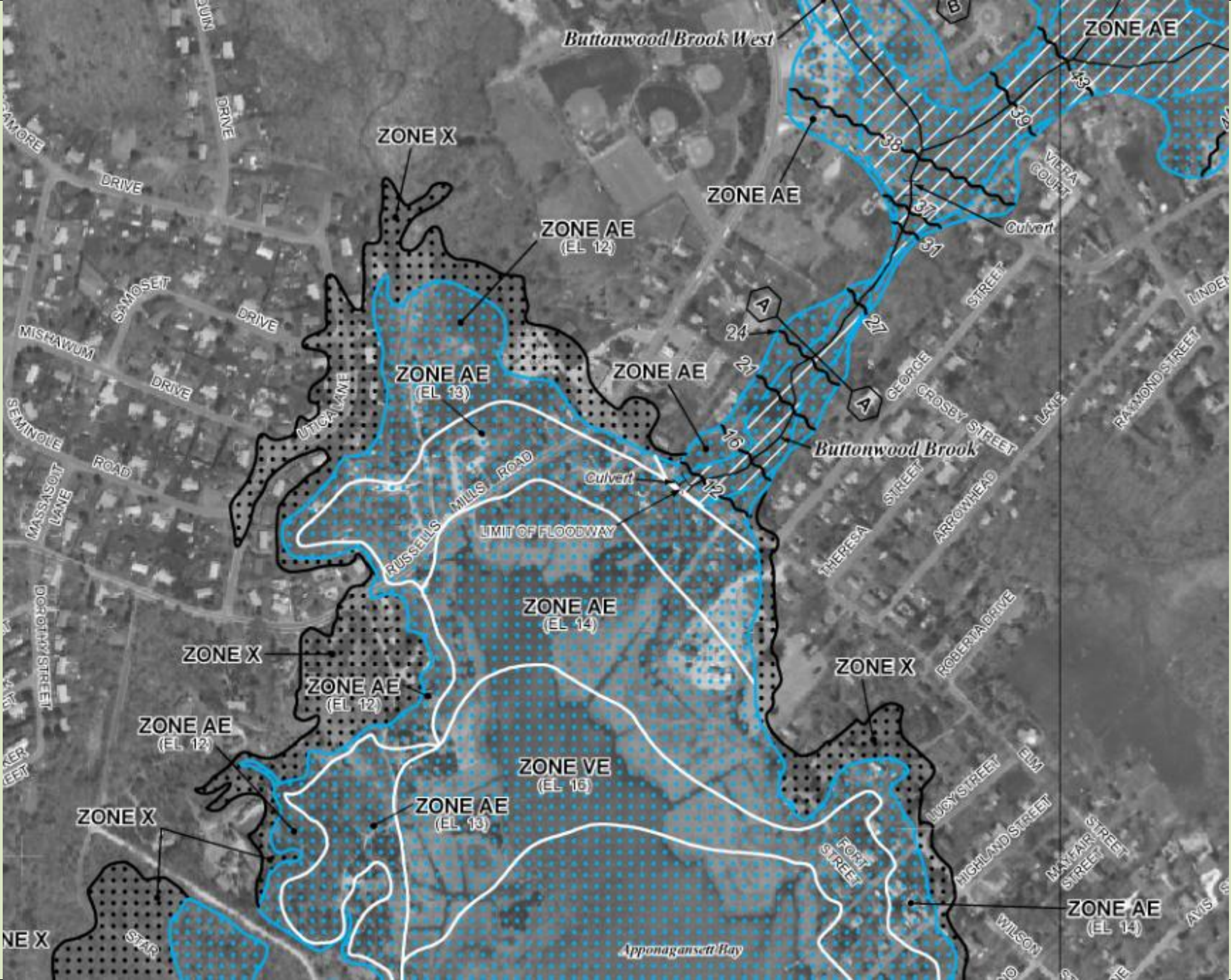

Buttonwood Brook West
ZONE AE
ZONE X
ZONE AE
ZONE AE
(EL 12)
Culvert
ZONE AE
(EL 13)
ZONE AE
Buttonwood Brook
Culvert
LIMIT OF FLOODWAY
ZONE AE
(EL 14)
ZONE X
ZONE X
ZONE AE
(EL 12)
ZONE AE
(EL 12)
ZONE VE
(EL 16)
ZONE X
ZONE AE
(EL 13)
ZONE AE
(EL 14)
Apponagansett Bay
DRIVE
SAMOSET
DRIVE
MISHAWUM
DRIVE
SEMINOLE
ROAD
MASSASOIT
LANE
DOROTHY STREET
UTICA LANE
RUSSELLS MILLS ROAD
VIERA COURT
STREET
GEORGE
CROSBY STREET
LANE
RAYMOND STREET
LINDEN
STREET
THERESA
ARROWHEAD
ROBERTA DRIVE
LUCY STREET
ELM
HIGHLAND STREET
MAYFAIR STREET
STREET
FORT STREET
WILSON
STAR
AVIS

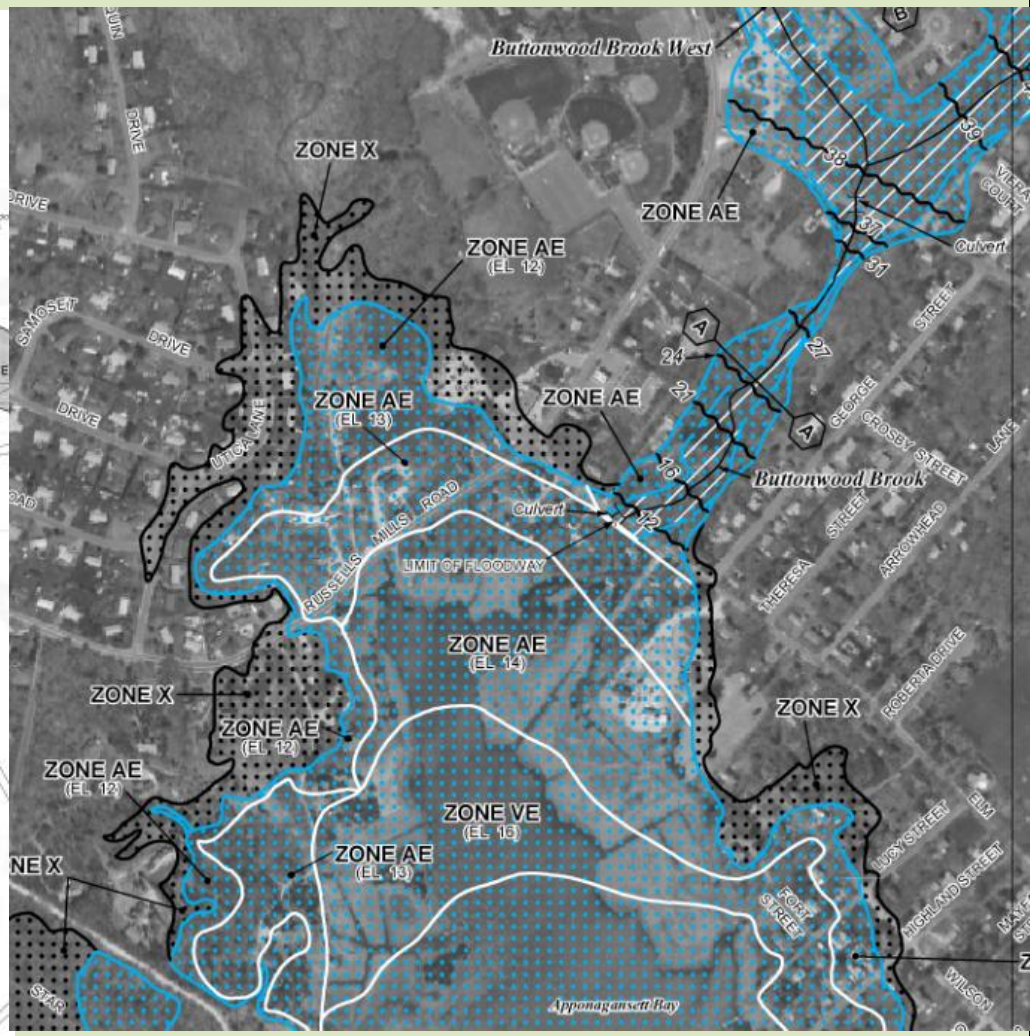
“Map Modernization” and “Risk MAP”

- Flood maps in MA (and the country) are undergoing dramatic changes
- The map changes are both technical (engineering analyses) and cosmetic (map “look and feel”)
- Focus on coastal areas, levees, etc.

Different Levels of Updates

- Conversion
  - Digital format
  - New datum
- Redelineation
  - Use new topography to redraw boundaries
- Restudy
  - Revised analysis / new flood study

Before and After



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...These Changes are Coming (or Here)

- Switch to “county-wide” format
- Paneling scheme based on USGS quads
- Use of orthophoto base map
- Datum conversion from NGVD29 to NAVD88
- Flood zone designations (labels) changed
- Redelineation based on better topography
- Incorporation of primary frontal dune
- Floodways incorporated into FIRM
- Changes to wave height / setup / runup
- Available as GIS-usable datalayer(s)

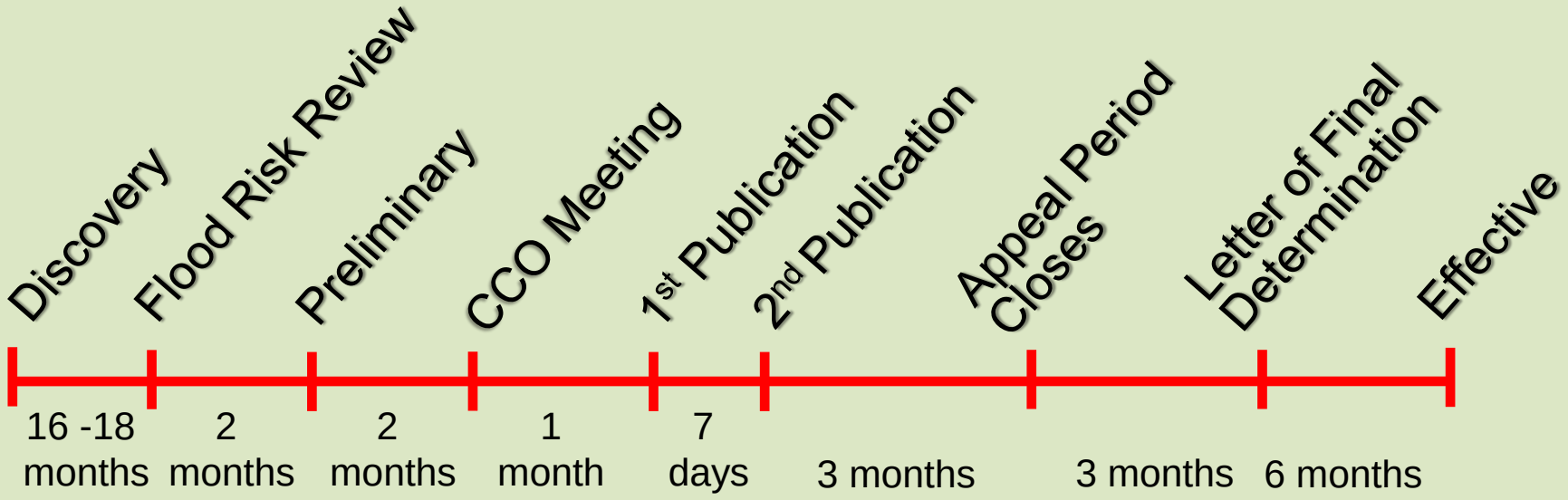
What's better...

- ☺ Orthophoto base has more data
- ☺ Updated analyses provide better estimates of flood risk
- ☺ Detailed digital database usable with GIS
- ☺ Digital products easier to store and share (save the trees!)
- ☺ NAVD88 datum better standard for surveyors
- ☺ Bad elevation reference marks removed (nail in phone pole)
- ☺ Community boundary mismatch areas reduced or eliminated

What's not...

- ☹ Map can be cluttered
- ☹ Many areas have not been updated (date misleading)
- ☹ Easy to misuse data beyond its quality
- ☹ Digital products difficult for low-tech users (no paper)
- ☹ Datum change can be very confusing to non-surveyors
- ☹ Many useful elevation reference marks removed
- ☹ Countywide format difficult to use by community officials (much community-specific data lost)

Typical Mapping Study Timeline



FEMA engineering and mapping takes a minimum of 3 years to complete.

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General Points to Consider

- Maps are strictly a graphic representation of engineering data
- Detailed information generated only at specific locations
- Effective maps may not have all current techniques incorporated
- Digital products have their limits and should not be used beyond those limits
  [*"A man's gotta know his limitations."*]

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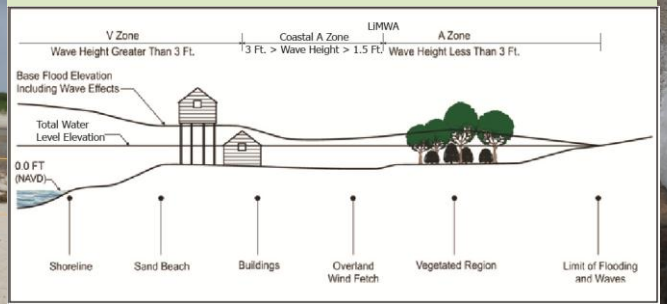
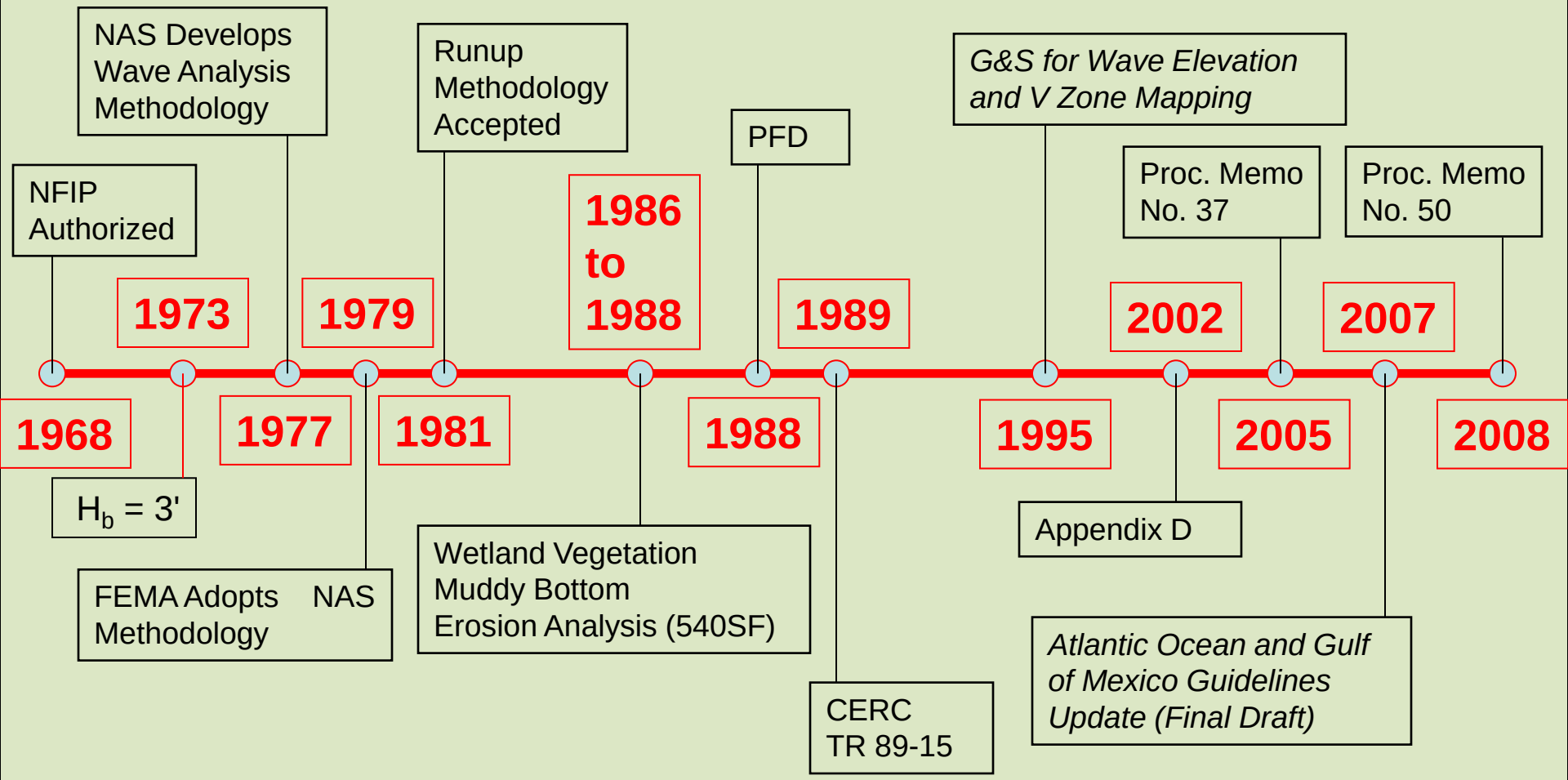
Technical Changes to Coastal Studies

- Reanalysis of stillwater elevations
- Inclusion of wave setup to determine total stillwater elevation
- Shifting from average to 2% for identified wave runup
- Mapping landward toe of primary frontal dune
- Considering coastal structures under both intact and failed conditions



History of Coastal Floodplain Mapping



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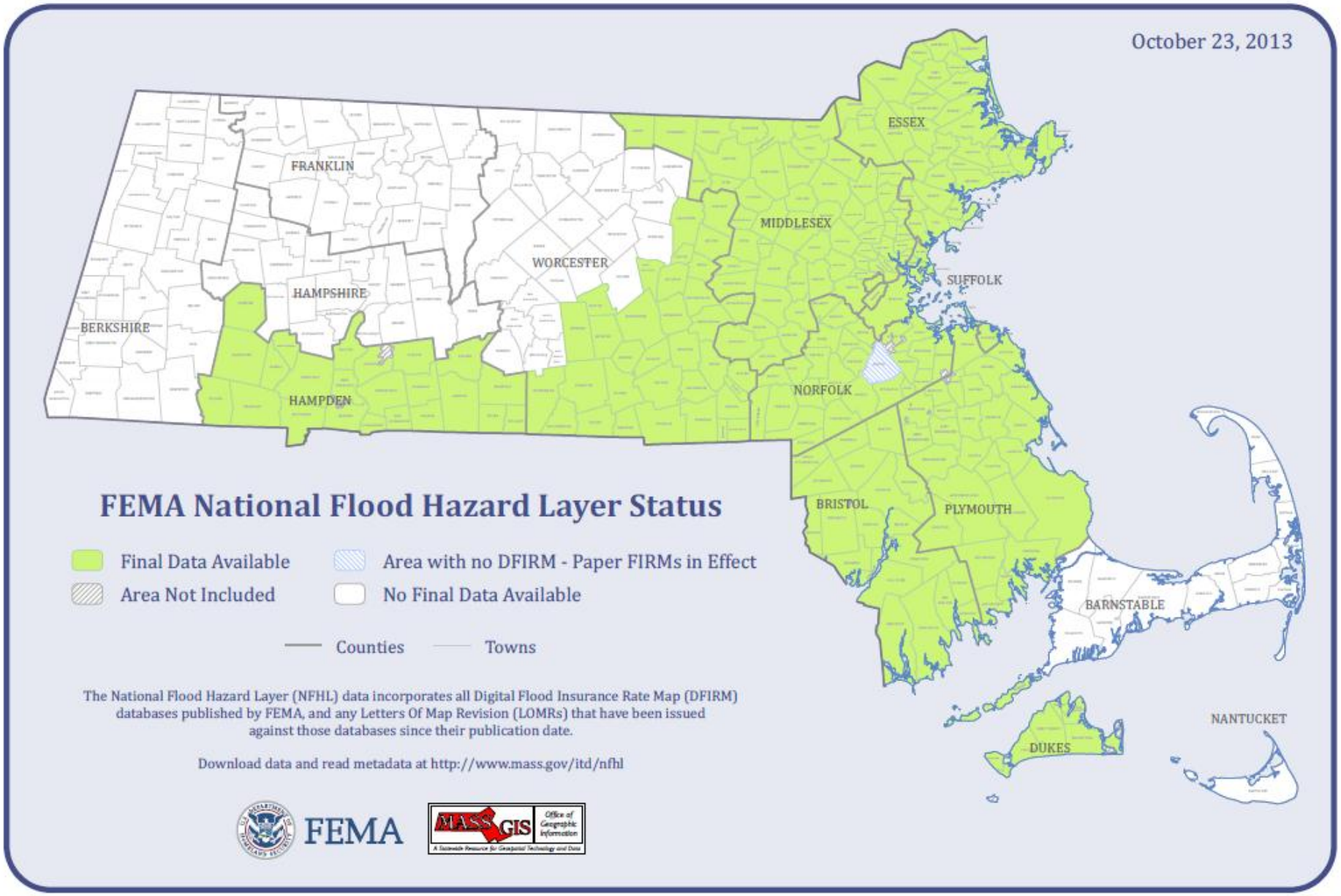
Status of Map Revisions (current)



Status of Map Revisions (current)

- "Effective" county-wide maps (w/eff. date):
  - Bristol, July 7, 2009
  - Dukes, July 6, 2010
  - Essex, July 3, 2012
  - Hampden, July 16, 2013
  - Middlesex, June 4, 2010
  - Norfolk, July 17, 2012
  - Plymouth, July 17, 2012
  - Suffolk, September 25, 2009
  - Worcester (partial), July 4, 2011

Status of Map Revisions (current)

- Letter of Final Determination (LFD) issued (effective date established):
  - Barnstable, January 16, 2014 (eff. July 16, 2014)
  - Bristol, January 16, 2014 (eff. July 16, 2014)
  - Essex, January 16, 2014 (eff. July 16, 2014)
  - Plymouth (Marion, Mattapoisett, and Wareham), August 5, 2013 (eff. February 5, 2014)
  - Norfolk (Quincy and Milton), December 9, 2013 (eff. June 9, 2014)
  - Nantucket, December 9, 2013 (eff. June 9, 2014)
  - Middlesex (Concord River watershed communities), January 7, 2014 (eff. July 7, 2014)
  - Worcester (Concord River watershed communities), January 16, 2014 (eff. July 16, 2014)

Status of Map Revisions (ongoing)

- "Preliminary" maps (w/prelim. date):
  - Coastal studies:
    - Dukes, June 3, 2013
    - Plymouth, May 1, 2013 and October 12, 2012
    - Suffolk, November 15, 2013
  - Watersheds (riverine):
    - Shawsheen, Middlesex, February 11, 2011
    - Narragansett, Bristol, Norfolk, and Plymouth, TBD

Status of Map Revisions (future)

- Future map update efforts will be determined by FEMA in consultation with states
- National mapping priority will be mapping of areas behind non-accredited levees
- Regional and state priorities will be evaluated based on funding levels available
- National funding levels for map updates will be determined by Congress; those funds will then be distributed on a regional basis

For More Information

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