

Staying Afloat: FEMA and Flood Insurance Changes



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***MMA Annual Meeting
& Trade Show
Jan. 24-25, 2014***

WHG Involvement

Environmental, Scientific & Engineering Work in Coastal Zone

- *Flood Insurance Restudies for FEMA*
- *Technical review of FEMA FISs and FIRMs*
- *Appeals filed for areas of Plymouth County*
- *Currently reviewing maps for City of Boston*
- *Science & engineering based analyses*
- *Accurate assessment of flood risks*

Topics for Discussion

- ***FEMA's Flood Mapping in MA***
- ***Controlling engineering factors***
- ***Updates to recent maps & associated map changes***
- ***Focus areas for technical review***
- ***Areas for improvement***

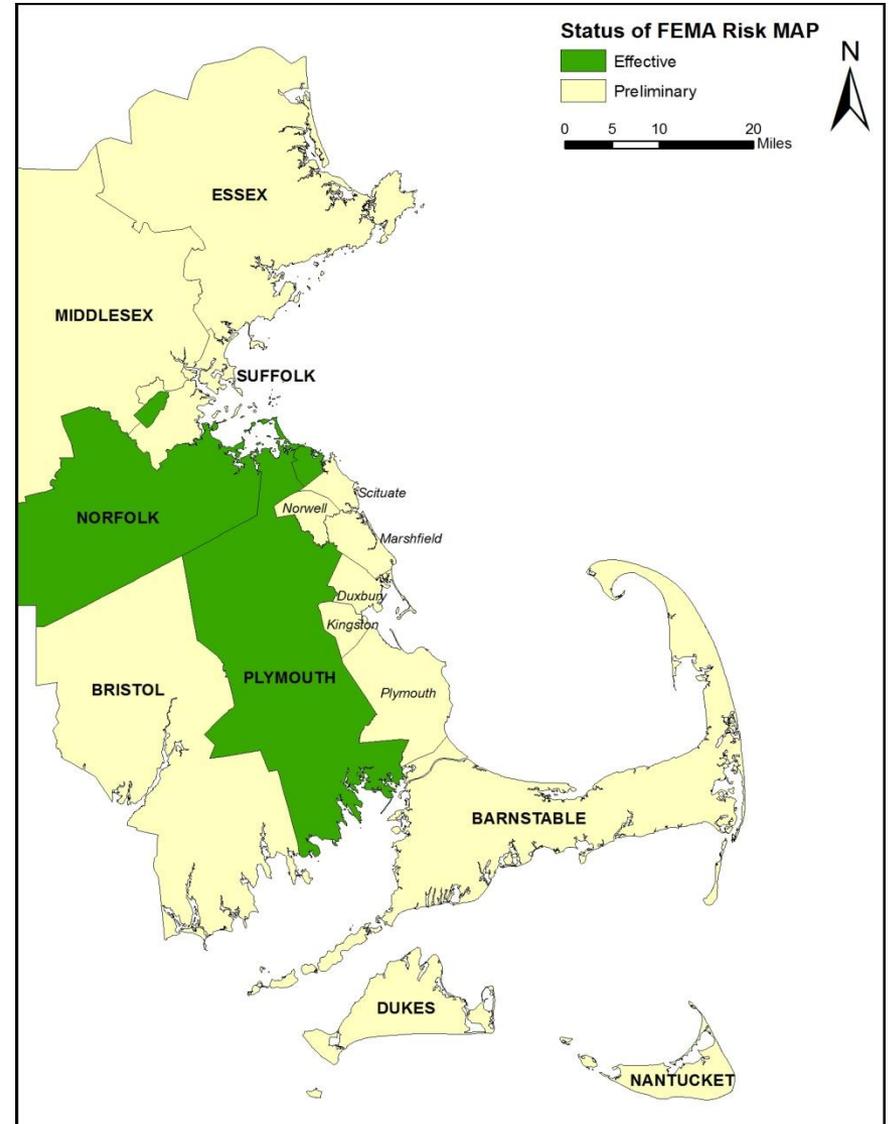
FEMA Risk MAP in MA

Preliminary Maps

- *coastal counties*
- *issued 2012-2013*
- *updated previous maps 2009-2012*
- *updated Barnstable Co. maps 1984-1999*

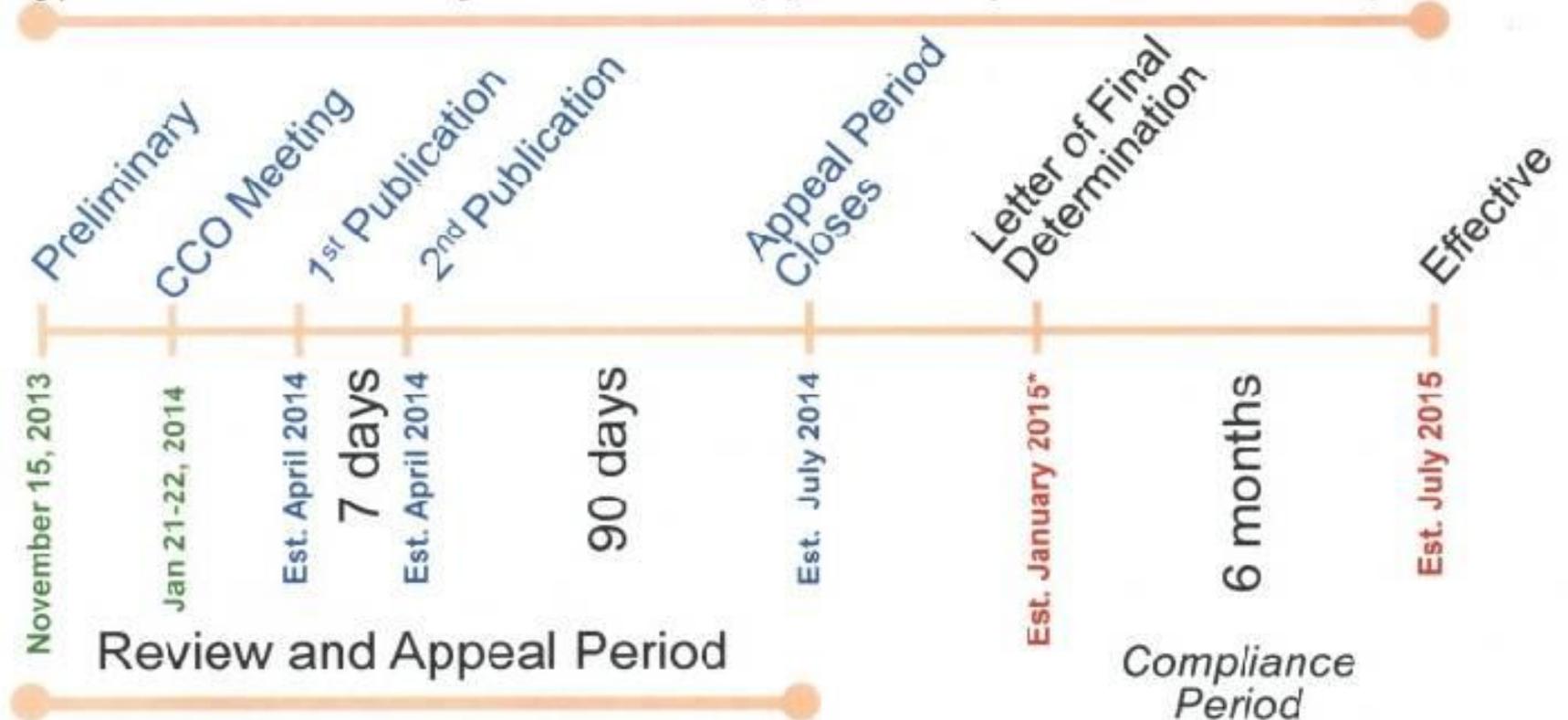
Effective Maps

- *Norfolk Co. and parts of Plymouth Co. 7-2012*



Post-Preliminary Phase Timeline

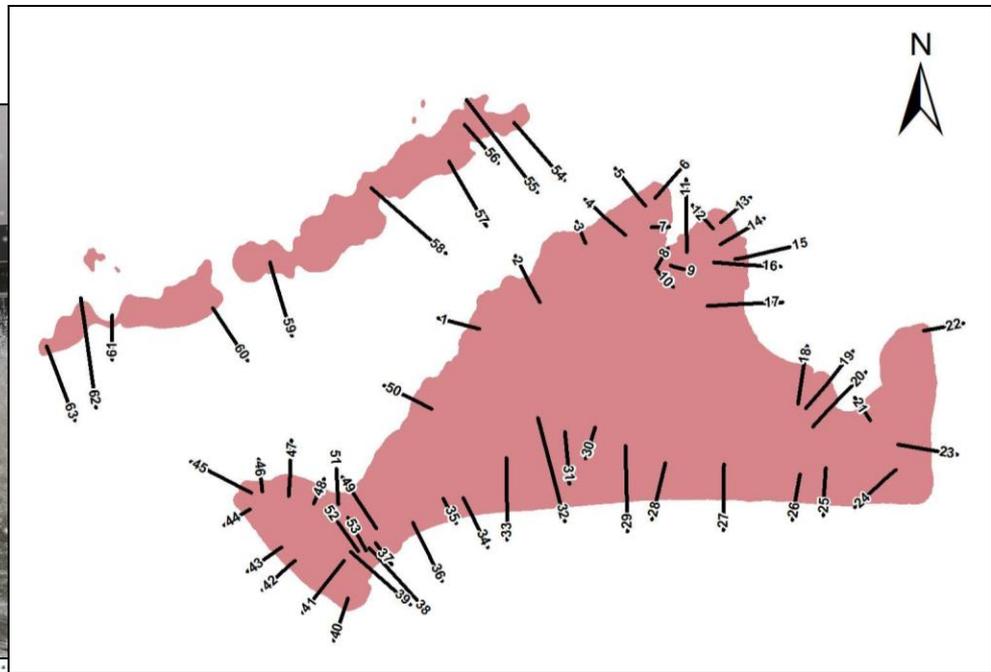
Typical Post Preliminary Phase takes approximately 20 months to complete



Coastal Flood Hazard Analyses

5 Primary Components

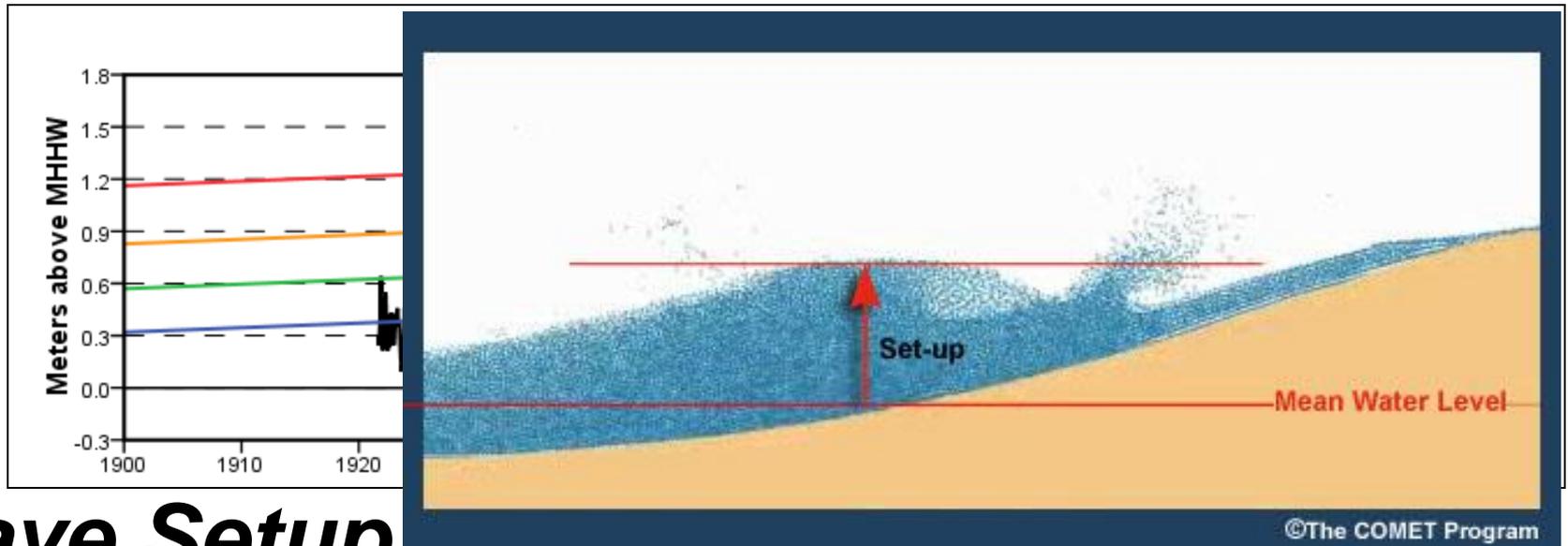
- *Stillwater level (storm surge) + wave setup*
- *Erosion*
- *Overland wave propagation*
- *Wave runup & overtopping*
- *Primary frontal dune*



Open Coast Water Levels

Stillwater/storm surge (SWL)

- Army Corps flood profiles
- Long-term tide gage data



Wave Setup

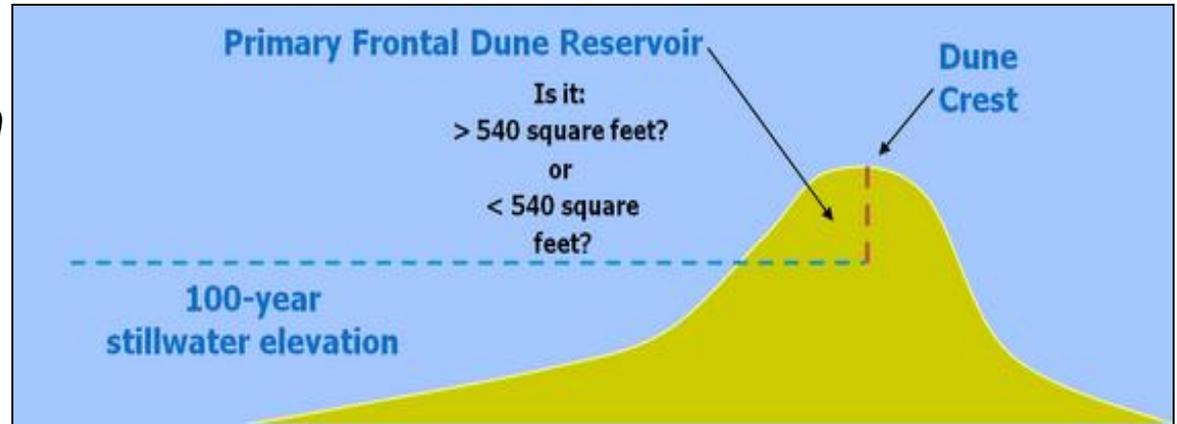
- Nearshore slope
- Deepwater wave heights

$$TWL = SWL + \text{wave setup}$$

Erosion

Dune Erosion

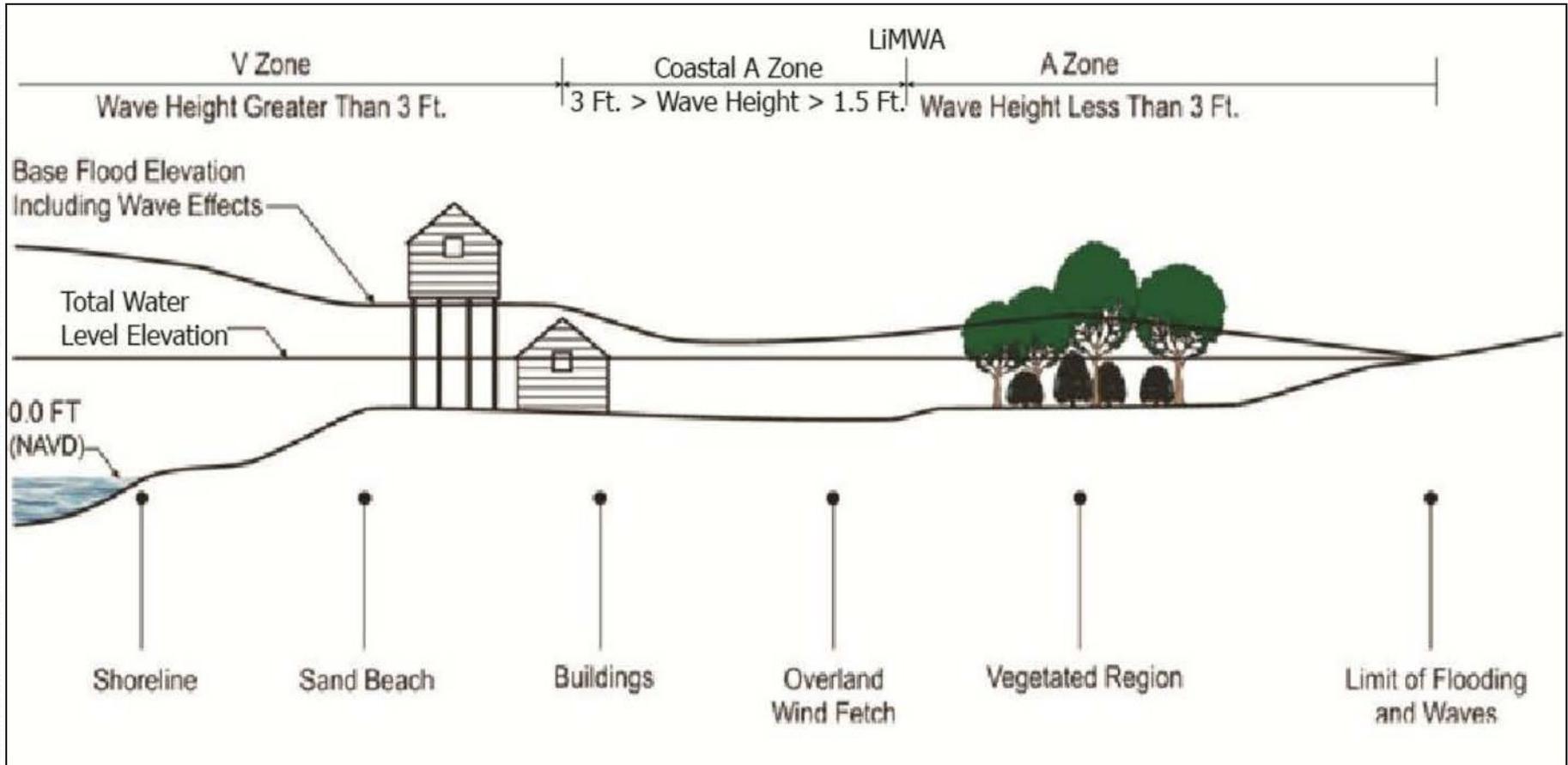
- *Retreat*
- *Removal*



Coastal Structures

- *Non certified*
- *Failure*

Overland Wave Propagation

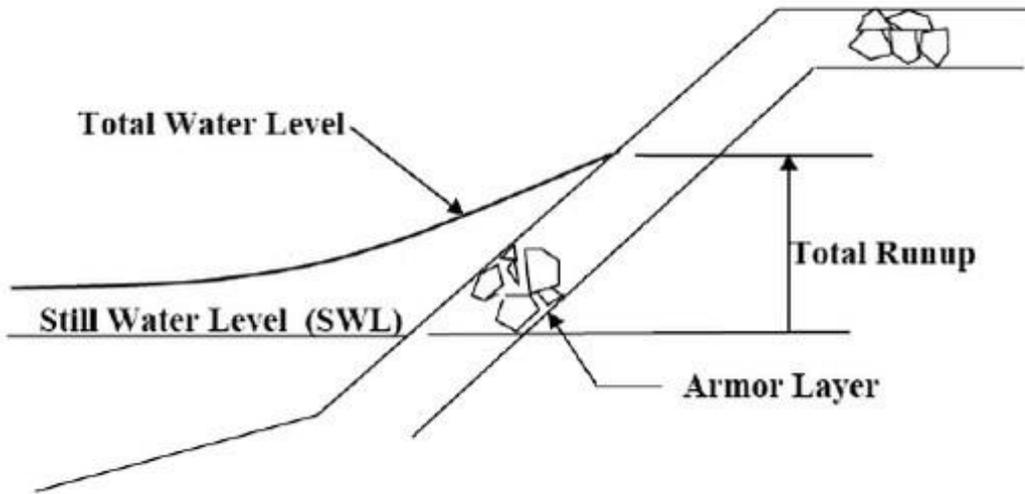


- *land features*

- *vegetation*
- *buildings*

- *open water*

Wave Runup & Overtopping



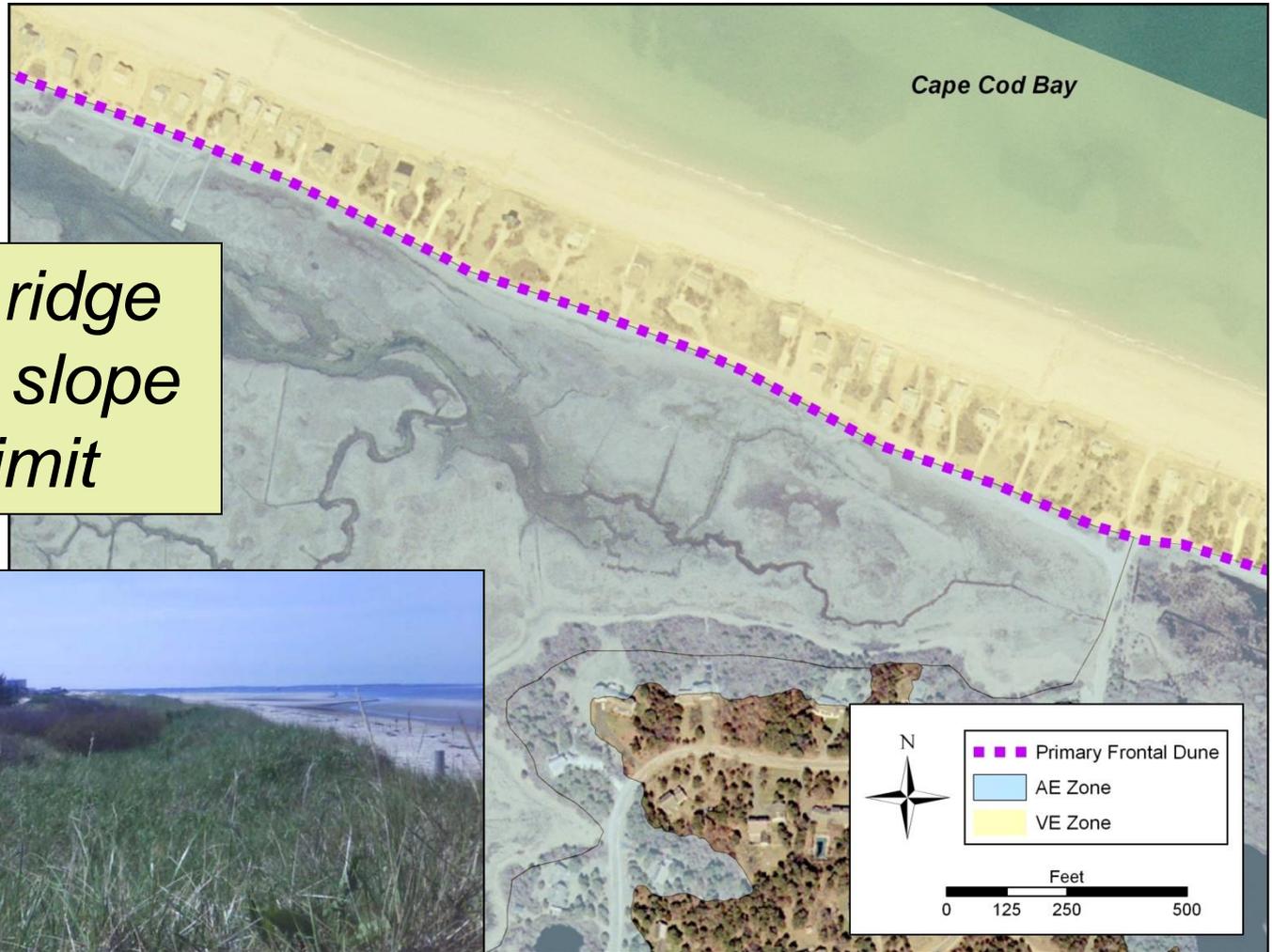
- *shoreline slope*
- *roughness*



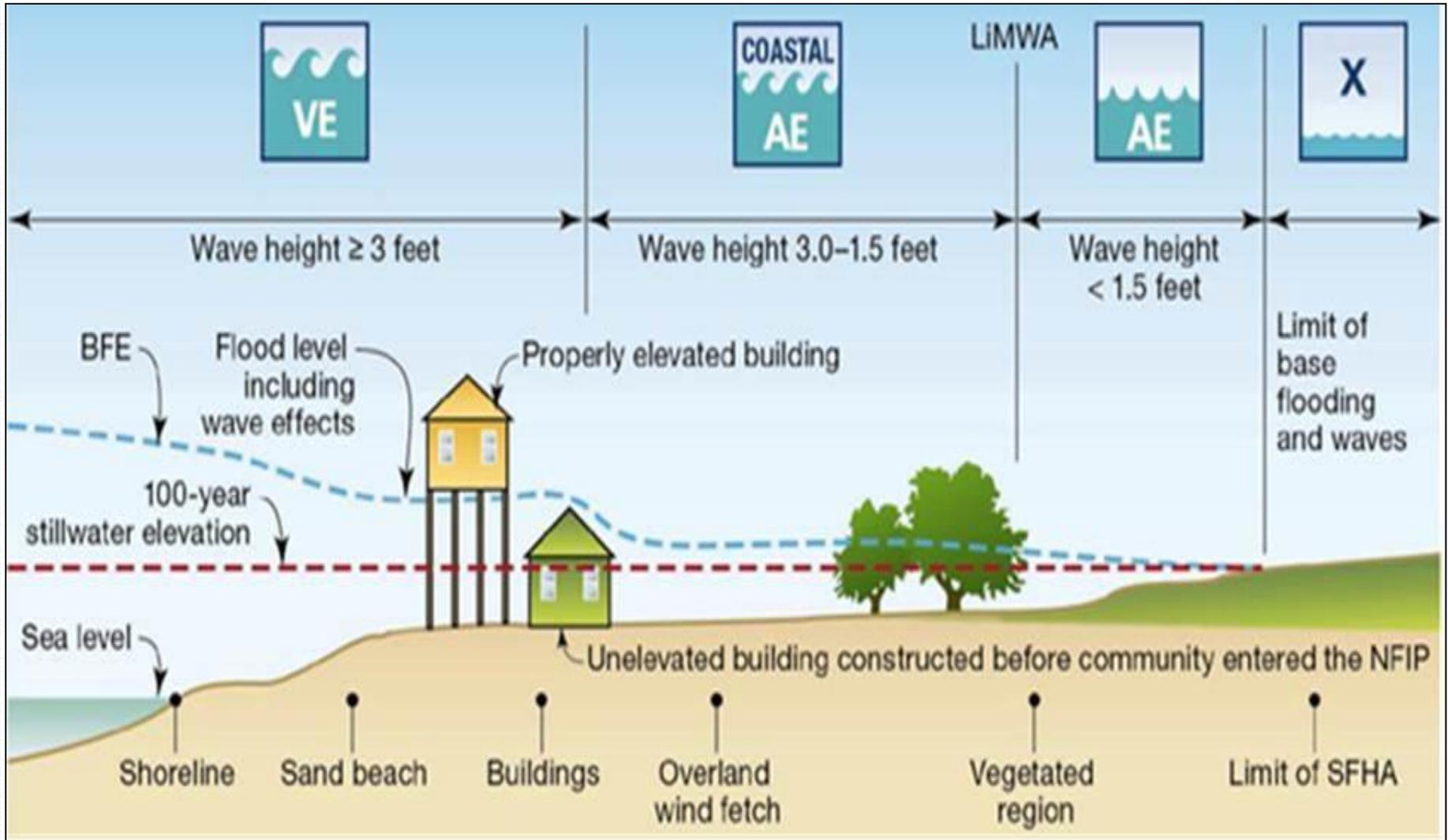
- *freeboard*

Primary Frontal Dune

- *mound or ridge*
- *change in slope*
- *VE zone limit*



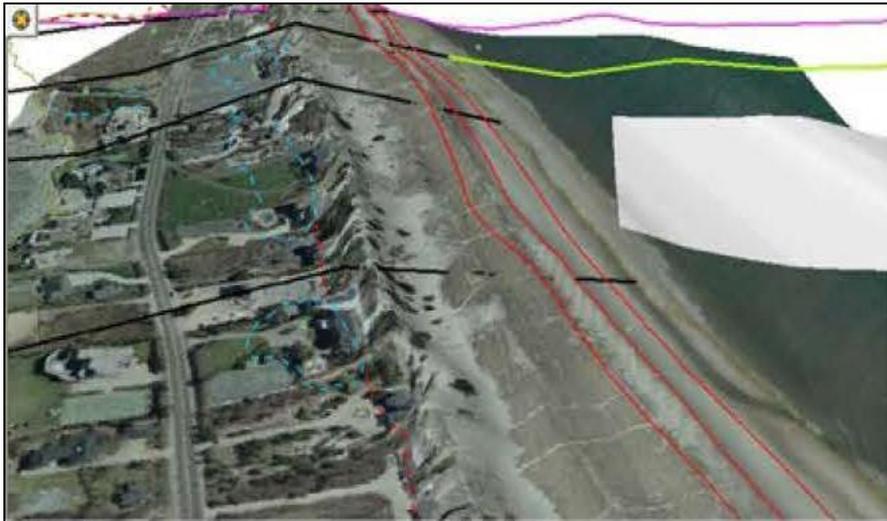
Flood Zone Mapping



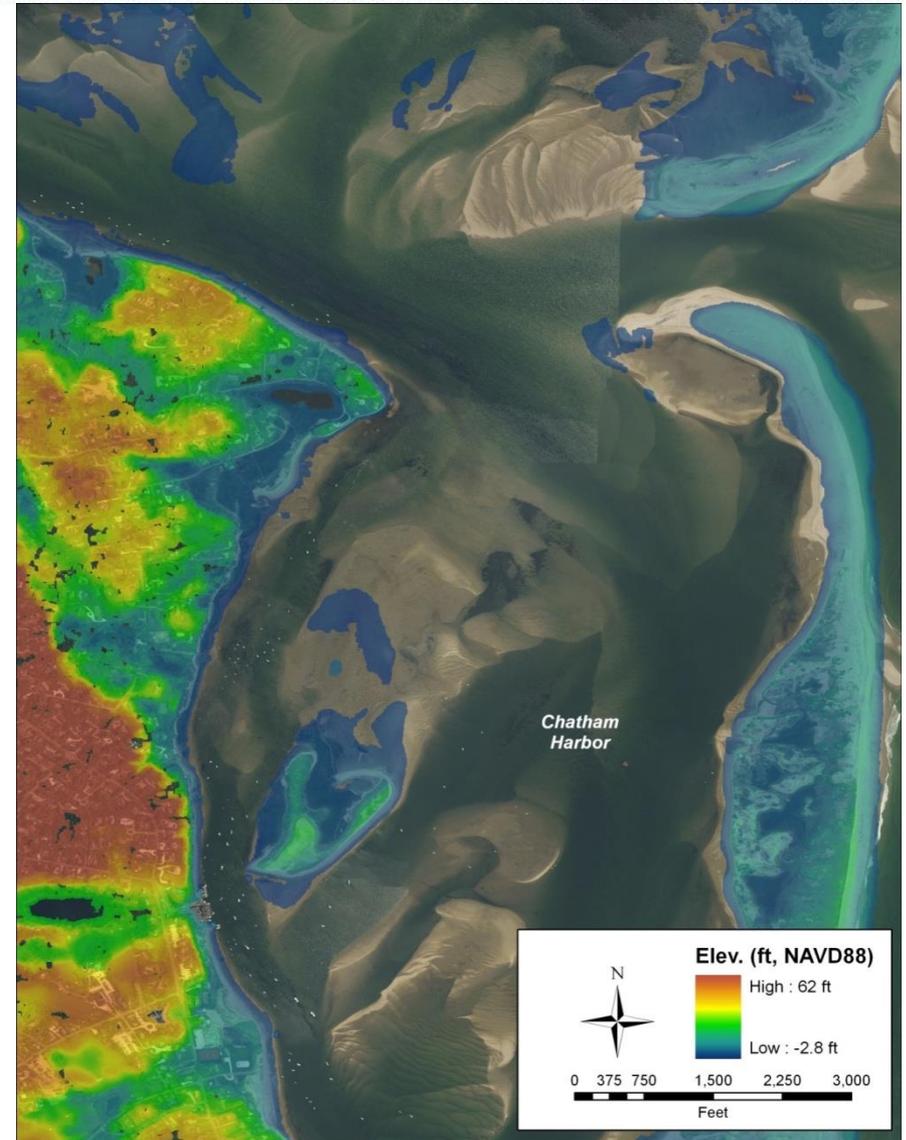
Updates to Recent Mapping

Elevation Data

- LiDAR 2010-2011



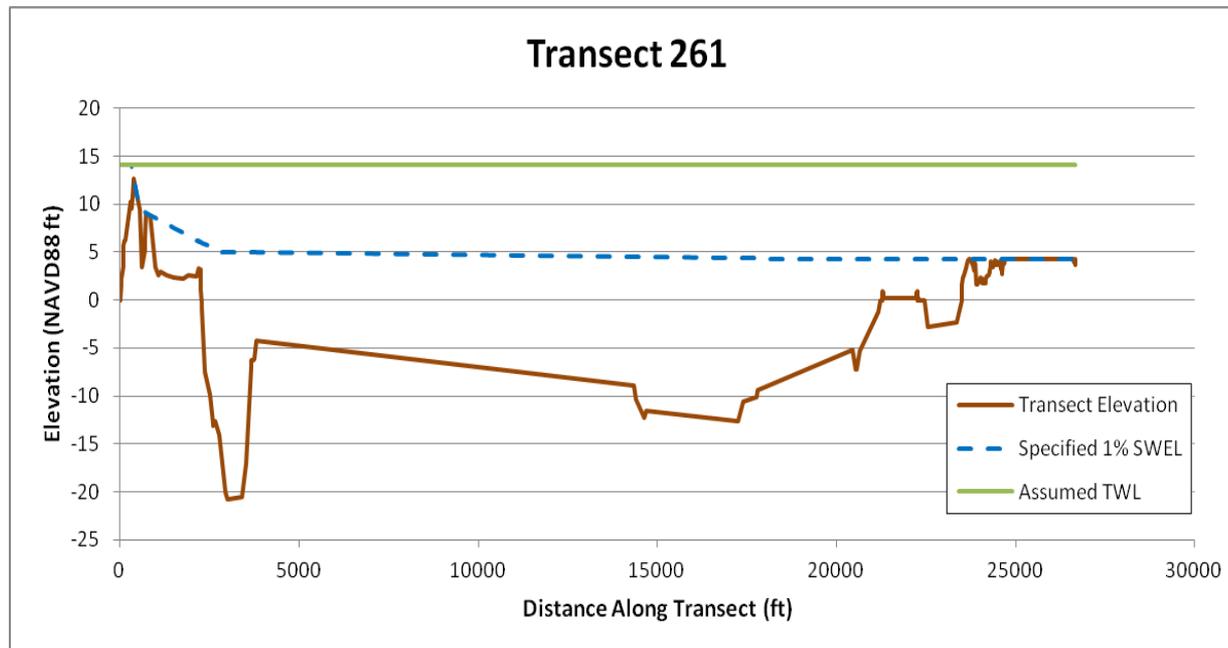
Primary Frontal Dune



Updates to Recent Mapping

Wave Setup

- $TWL = SWEL + \text{wave setup}$

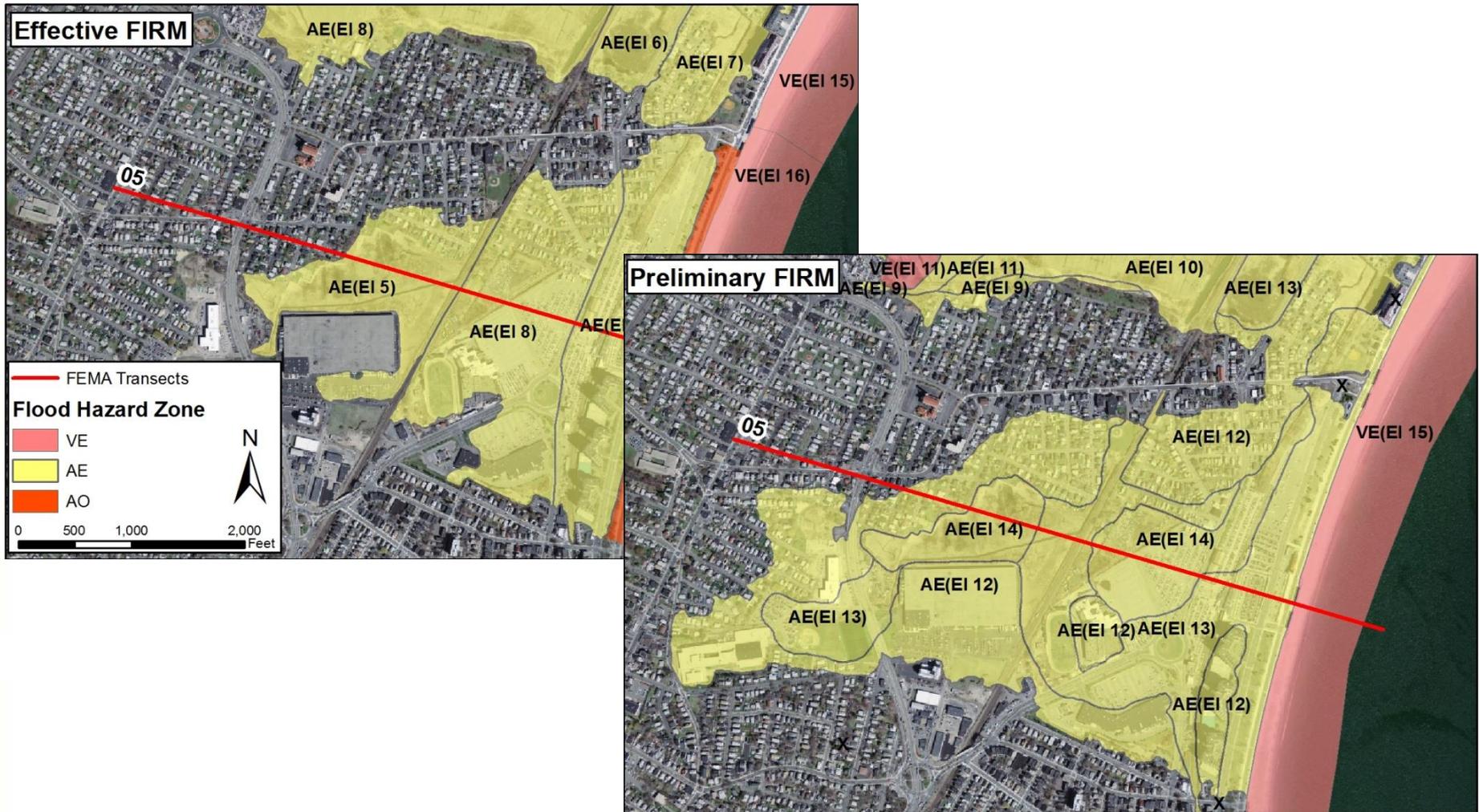


Wave Runup (updates older maps)

- 2% runup

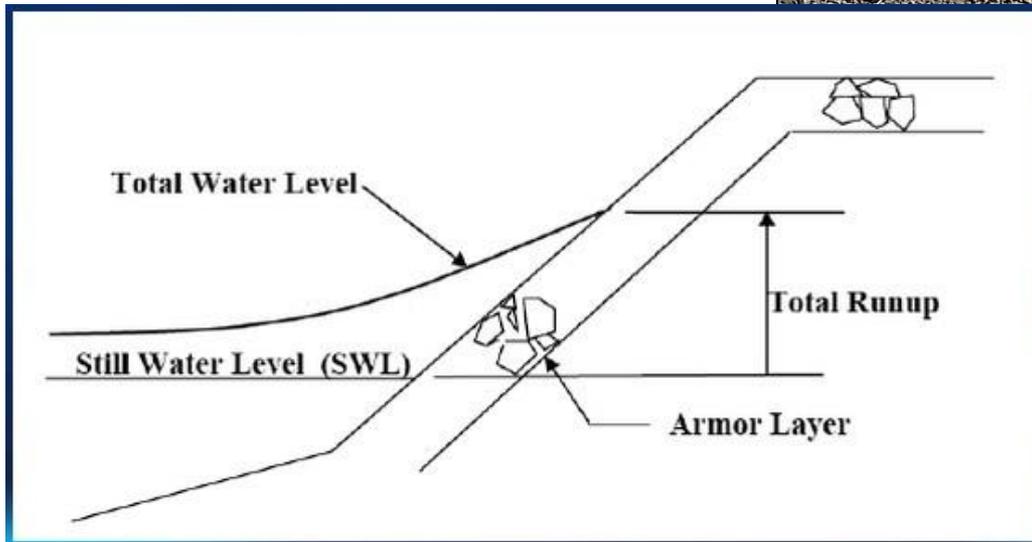
Implications

Wave Setup: Increased SFHA & BFEs



Implications

Wave Runup: Increased BFEs



Map Review Focus Areas

SWELs (100-yr water levels)

Input wave heights

PFD delineation

Erosion/structure failure

Roughness for wave runup calcs

Landform characterization

Account for attenuation of TWL

Storm Surge Modeling



Storm Surge Modeling



Storm Surge Modeling



Storm Surge Modeling Zoom



Storm Surge Modeling Zoom



Storm Surge Modeling Zoom



Conclusions

Review Maps

Seek Advice

Work Cooperatively with FEMA

Accurate Mapping Allows

- *targets flood insurance where it is needed*
- *identifies pre disaster mitigation needs*

Questions

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