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Update on Regulations for Land Subject to Coastal Storm Flowage and Thoughts on Resiliency Planning

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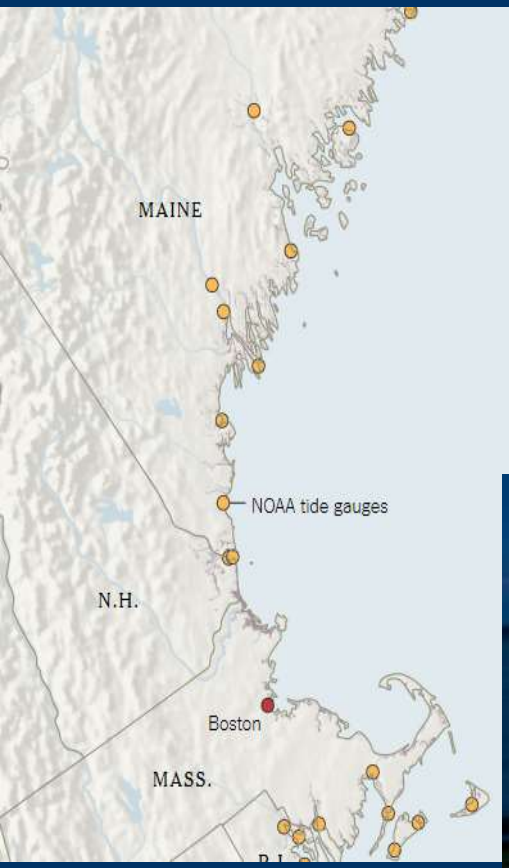
Why do we need these regs?

- Prevent/reduce flood damage, decrease repetitive loss claims, protect public safety and infrastructure
- To advance resiliency to sea level rise and provide opportunity for climate change adaptation
- Provides standards and guidance in an area that is currently lacking



A Sharp Increase In 'Sunny Day' Flooding

By JONATHAN CORUM SEPT. 3, 2016

Global warming and rising seas are increasing the amount of tidal flooding on the Atlantic and Gulf Coasts. Flood levels are different from city to city, but the trends are similar. Related Article

Boston
The city has not been hit by tidal flooding as hard as cities farther south, but it is working on a plan to combat flooding and sea-level rise.

The New York Times

Flooding of Coast, Caused by Global Warming, Has Already Begun

Scientists' warnings that the rise of the sea would eventually imperil the United States' coastline are no longer theoretical.

By JUSTIN GILLIS SEPT. 3, 2016

King Tide

Scituate, 2016

Boston, 2016

Storm Damage

Subjects of Group's Review

- Impacts of coastal flooding
- Predictions of sea level rise
- Characteristics of LSCSF that reduce storm damage and flooding
- DRAFT 1995 LSCSF Regulations
- Measures to promote resiliency for existing buildings

LSCSF functions to:

- Slow down flood waters, allow them to flow across a natural landform surface, and provide frictional resistance, thereby reducing their energy and destruction potential.
- When flood waters encounter obstructions, channelization of flood waters and storm-wave overwash occurs, increasing velocity and volume of flow to adjacent or landward areas.

Scituate

Function: Slow Down Flood Water

Characteristics important for this function:

- Slope, soil characteristics, vegetation, erodability, permeability.
- Reduces energy and destruction potential, protecting landward areas.

LSCSF Function

- Allowing water to flow unimpeded under elevated buildings allows energy dissipation.
- Solid foundations deflect, reflect or redirect waves and flood water, channeling more water flowing at higher velocities onto adjacent resource areas, properties and public roads.
- Elevating the lowest structural member above the FEMA Base Flood Elevation to account for sea level rise increases storm damage and flood control functions of LSCSF.

Function: Allow Flood Waters to Spread Over a Wide Area

Sediment transport reduces energy and storm damage

Scituate

Source: Google

LSCSF functions to:

- Allow flood waters to be detained, absorbed into the ground, or evaporated into the atmosphere.
- Protect the land from storm erosion by providing a substrate for vegetation that helps to stabilize sediments and slow down floodwater.

Projects can diminish LSCSF functions:

Buildings on solid foundations and impervious surfaces in the floodplain may channel flood waters, with a higher velocity of flow to adjacent areas .

Reducing vegetation and pervious areas reduces surfaces that can detain, absorb, slow, or evaporate waters, thereby changing the drainage characteristics in a manner that could cause increased flood damage on adjacent properties.

Obstructions to Flow: channelizes flood water, increases velocity of water

Flow Channels: Findings from FEMA Hurricane Sandy Report

Impacts of Flow Channelization

Flood Hazard Data: FIRM = Zone AE (5 feet)
ABFE = Zone V (10 feet)
Sandy floodwater elevation = 7 feet NAVD88

House washed into the bay at the site of flow channel A

Flood Hazard Data: FIRM = Zone AE (5 feet)
ABFE = Zone V (10 feet)
Sandy floodwater elevation = 7 feet NAVD88

Undermined house with damaged foundation between flow channels B and C.

Impacts of Flow Channels

Undermined house south of flow channel D.

Status of Effort

- 15 meetings between April 2014 and October 2018
- Meeting scheduled for December 2018
- Based on a 1995 Draft that has been used as a model for many local by-laws
- MassDEP will conduct public hearings and commence public comment to promulgate regulations in early 2019

Resiliency Planning

- Time to start is now
- Needs support of leadership, all branches of government, state and municipal Departments and citizenry
- Risk analysis
  - Flood potential – degree, vulnerable neighborhoods, infrastructure, public and private property, urban vs. less developed
- Needs robust alternatives analysis

Balancing interests

- Armoring/fortifying, retreating, elevating, mimicking natural systems
- Living shorelines
- Conflicts of resources
- Balancing the interests of the Wetlands Protection Act