

Climate Change Considerations for Municipal Managers:

Metro-Boston Regional Strategy and Multi-Municipal Efforts



The MAPC Region

**Minuteman Advisory Group
on Interlocal Coordination
(MAGIC)**

**North Suburban
Planning Council (NSPC)**

**North Shore
Task Force (NSTF)**

**Inner Core
Committee (ICC)**

***We Are
Here!***

**MetroWest Regional
Collaborative
(MetroWest)**

**South Shore
Coalition (SSC)**

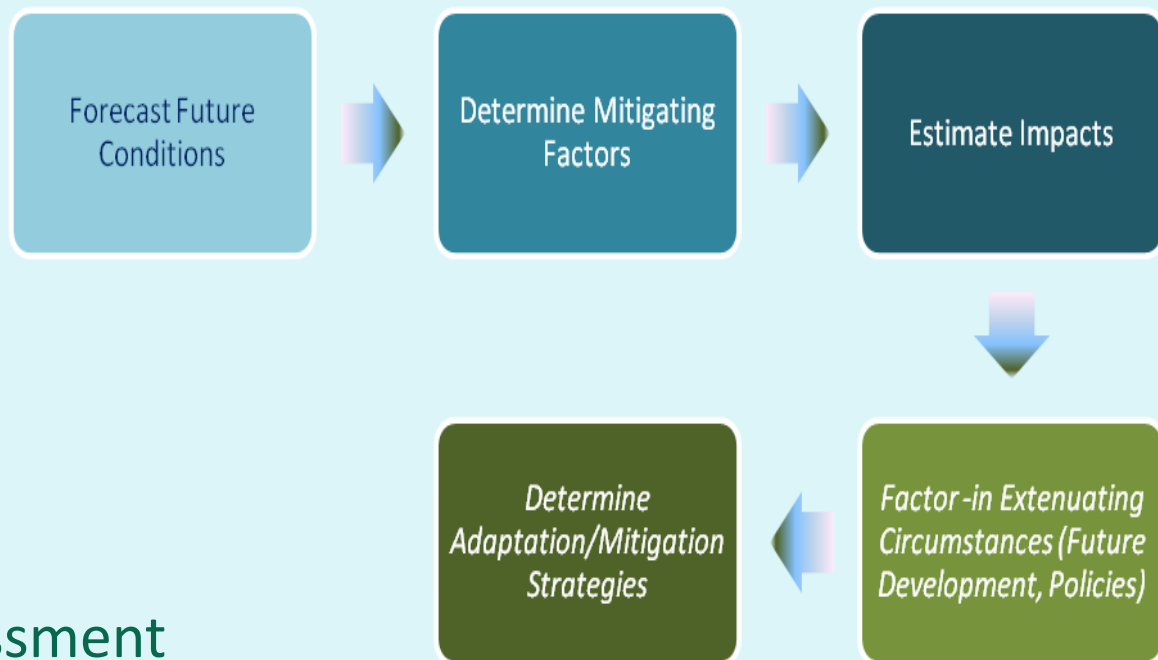
**South West
Advisory Planning
Committee (SWAP)**

**Three Rivers
Interlocal Council (TRIC)**



Dover is in Three Rivers and South West Subregions.
Milton and Needham Heights are in both the Inner Core and the MetroWest Collaborative.

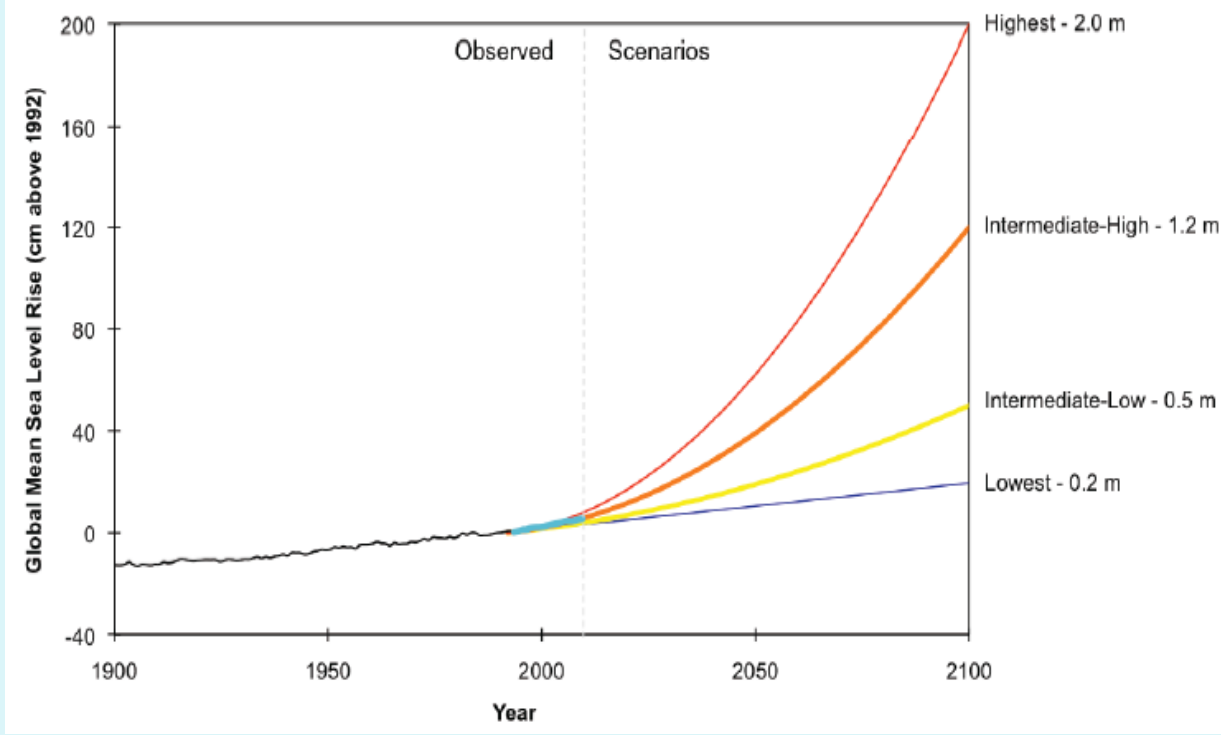
Metro-Boston Regional Climate Strategy



Includes:

1. Vulnerability Assessment
2. Regional/Sub-regional Goals and Objectives
3. Adaptation/Mitigation Strategies
4. Funding Sources

Future Conditions: Sea Level Rise



Greater Boston Harbor: Predicted Sea Level Rise (in Feet)

Emissions Scenario	2025-2030		2038-2050		2063-2070		2088-2100	
	CZM	BRAG	CZM	BRAG	CZM	BRAG	CZM	BRAG
Highest (RCP 8.5)	0.5	0.3-0.7	1.08	0.7-1.5	2.8	1.5-3.1	5.3	3.2-7.4
Intermediate High (RCP 6)	0.4	n/a	0.7	n/a	1.8	n/a	3.3	n/a
Intermediate Low (RCP 4.5)	0.2	0.3-0.7	0.4	0.7-1.4	0.92	1.3-2.6	1.5	2.4-5.1
Lowest (RCP 2.6)	0.2	0.3-0.7	0.3	0.6-1.4	0.50	1.1-2.3	0.71	1.8-3.8

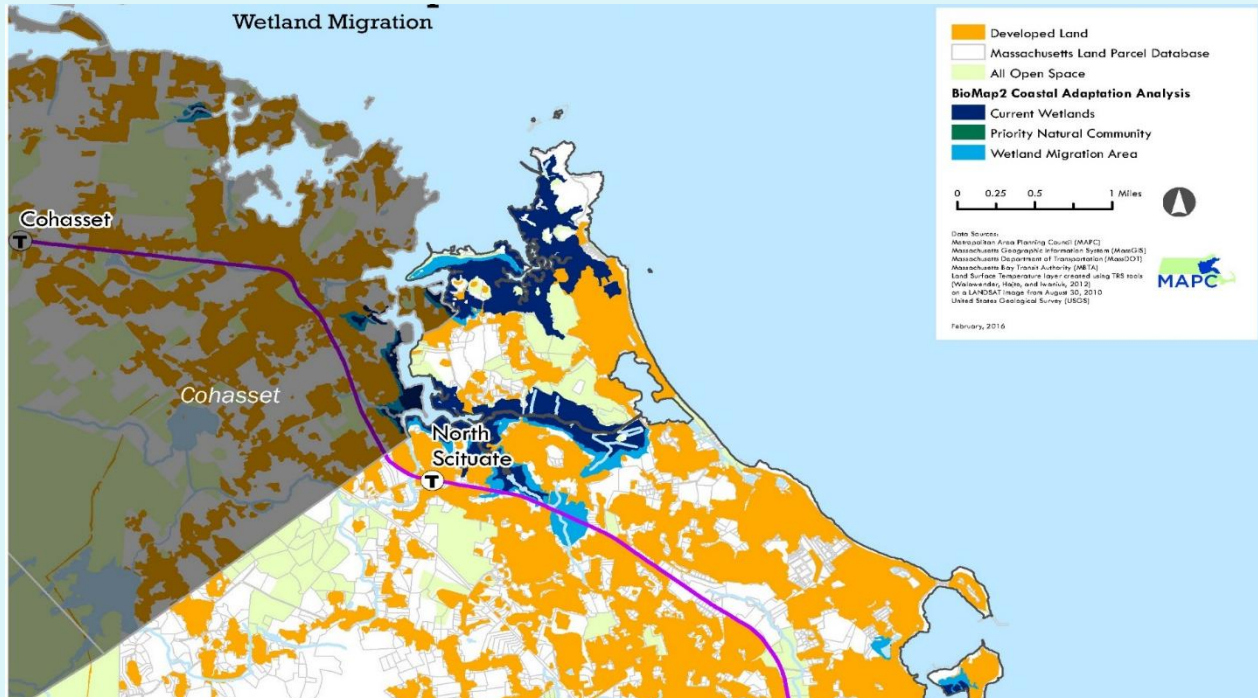
Future Conditions: Temperature & Precipitation Changes

Predicted Temperature Ranges - degrees Fahrenheit (CRB Consensus Report)				
	1961-2010 (baseline)	2010-2030	2035-2064	2070-2100
Annual Average	46 to 50	53 to 54	n/a*	56 to 59
Winter Average (Dec., Jan., Feb.)	23 to 28	30 to 33	30 to 36	34 to 42
Summer Average (Jun., Jul., Aug.)	68 to 69	70 to 72	71 to 76	74 to 84

*Annual averages were not produced for the 2035-65 timeframe.

Predicted Precipitation (BWSC 2015)				
	1961-2010 (baseline)	2035	2060	2100
RCP 6 GHG Scenario (Intermediate high)	5.2 in.	5.5 in.	5.8 in.	6.1 in.
RCP 8.5 GHG Scenario (Highest)	5.2 in.	5.6 in.	6.0 in.	6.7 in.

Mitigating Factors: Ecosystem Services

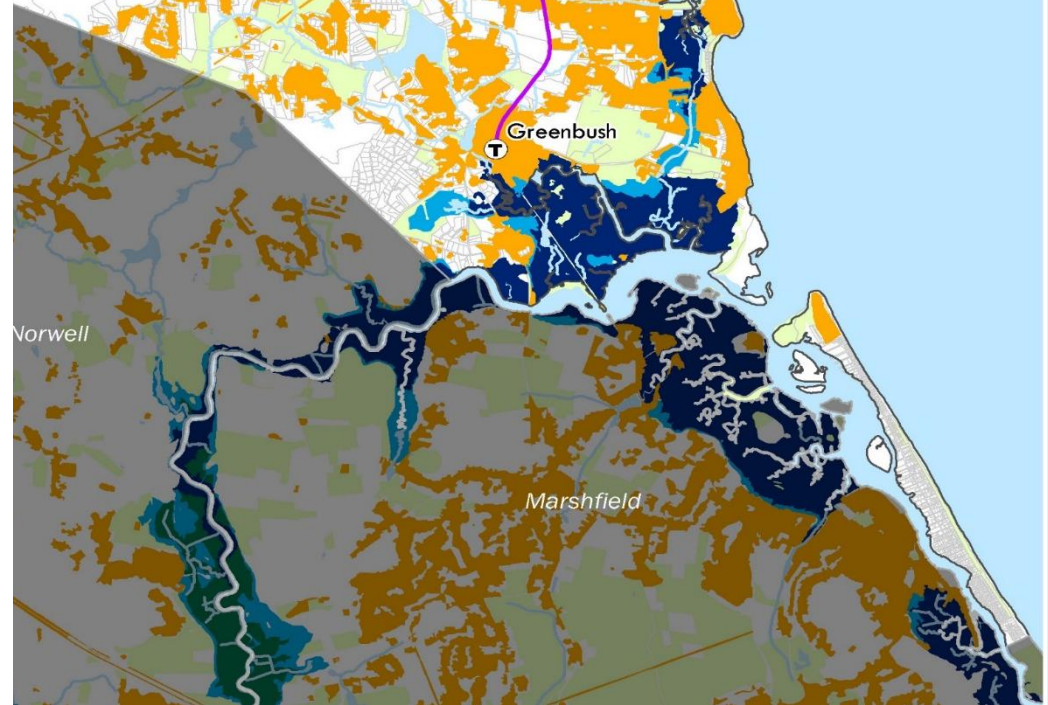


SECTION 9: FIVE YEAR ACTION PLAN

The following list provides concrete action items to meet the general goals identified in Section 8 of this Plan. Each action is accompanied by a proposed timeline for completion, as well as potential funding sources and parties responsible for implementing the Plan.

Goal 1: Conserve water bodies, aquifer areas, watershed and natural drainage areas, pond and stream shorelines.

ACTIONS	SCHEDULE	FUNDING	RESPONSIBLE PARTY
Identify and actively pursue undeveloped land that protects critical water resources.	ongoing	Self Help, CPA	Conservation Commission, Conservation Agent
Provide appropriate controls over future development along river banks, wetlands, pond/lake frontages, and aquifer areas.	ongoing		All local permitting agencies
Encourage management of forestry and other land cover resources along river, wetlands, ponds, and lakes.	ongoing		Planning Board, Board of Health, Conservation Commission
Publicly acquire or control critical wetlands, streambeds, ponds, lakes, and tributaries to ensure a high quality drinking water supply.	ongoing	Conservation Partnership Grant (CPG), Self Help, CPA	Conservation Commission, Department of Public Works (DPW), Community Preservation Committee (CPC),



Estimate Impacts



Salt Water Intrusion

Flooding

Coastal Erosion



Health Decline

Habitat Loss

Infrast. Damage



Flooding

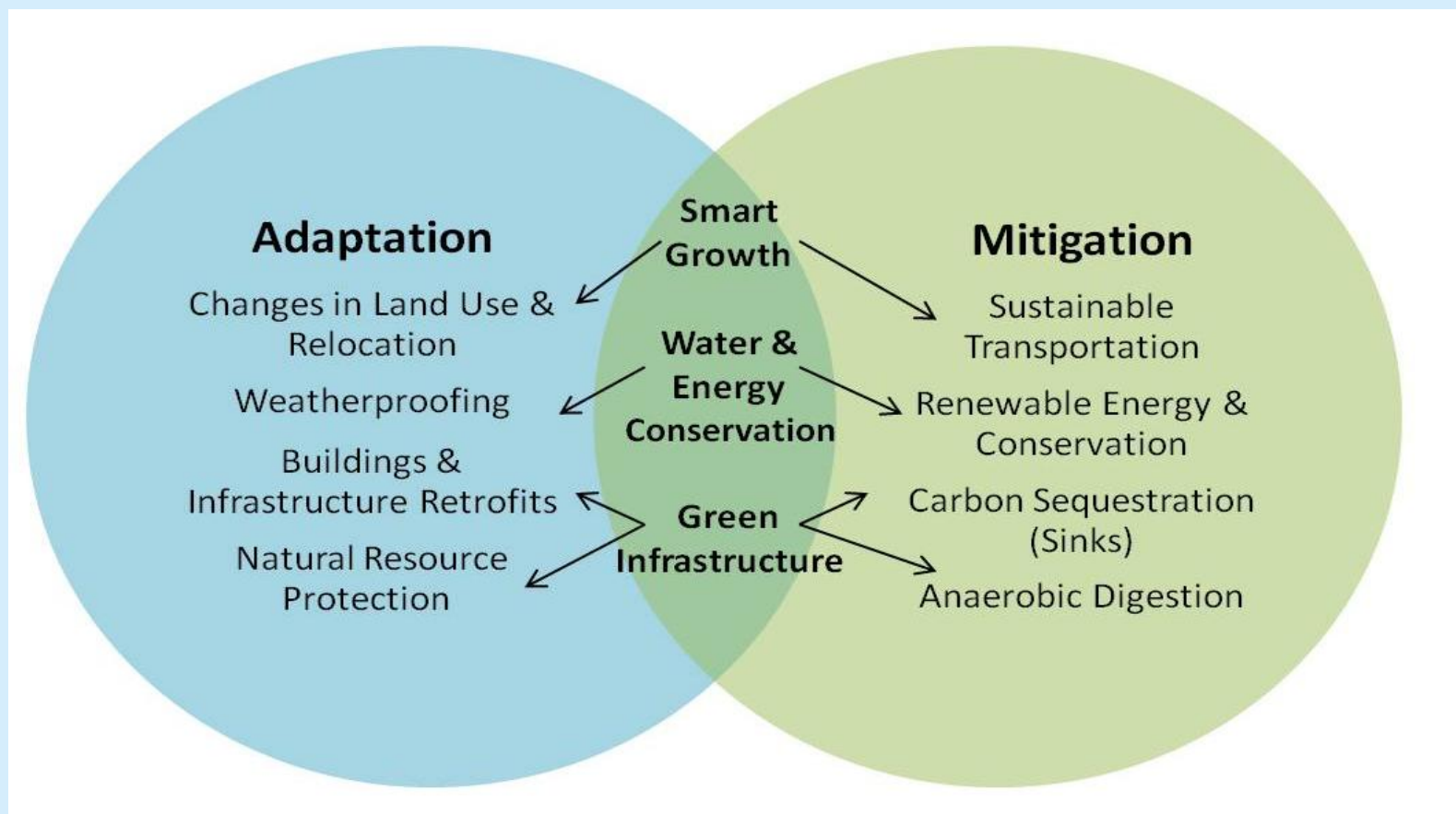
Drought Periods

Property Loss

Regional Strategy Goals & Objectives

Sector	Subtopic	Objectives
Built Environment	Development, Green Infrastr., Tree Canopy	1) New development/redevelopment designed to adapt to climate impacts (heat, precipitation, etc.)
	Development	2) Redevelopment located outside of the highest hazard areas
Natural Resources	Protection	3) Natural functions of ecosystems, shorelines and critical habitat areas will be restored
	Management	4) Conserve and manage habitats to support healthy fish, wildlife and plant populations and ecosystem functions
	Restoration	5) Restore ecosystem processes to increase capacity to adapt
Coastal Zone	Protection, Storm Assess.	6) Coastal areas resilient to climate change impacts
Key Infrastructure	Energy, Water/WW/SW, Transportation, Green Infrastructure	7) Resilient transportation, water/wastewater, and energy infrastructure
	Roads & Crossings	8) All existing tide and flood control structures assessed for flood control
Local Govt./Econ.	Asset Mgmt & Capacity	9) Local and regional asset management preparation and monitoring
Human Health & Welfare	Vector Diseases, Vulnerable Populations	10) A public protected from extreme climate change health impacts, with particular focus on vulnerable populations

Strategies



Resilient Growth

- Zoning Changes: Ensure natural resource conservation and sustainable development
- Stormwater Regs: implementing green infrastructure, and clean energy sources
- Wetlands Regs: Focus on preserving ecosystem functions



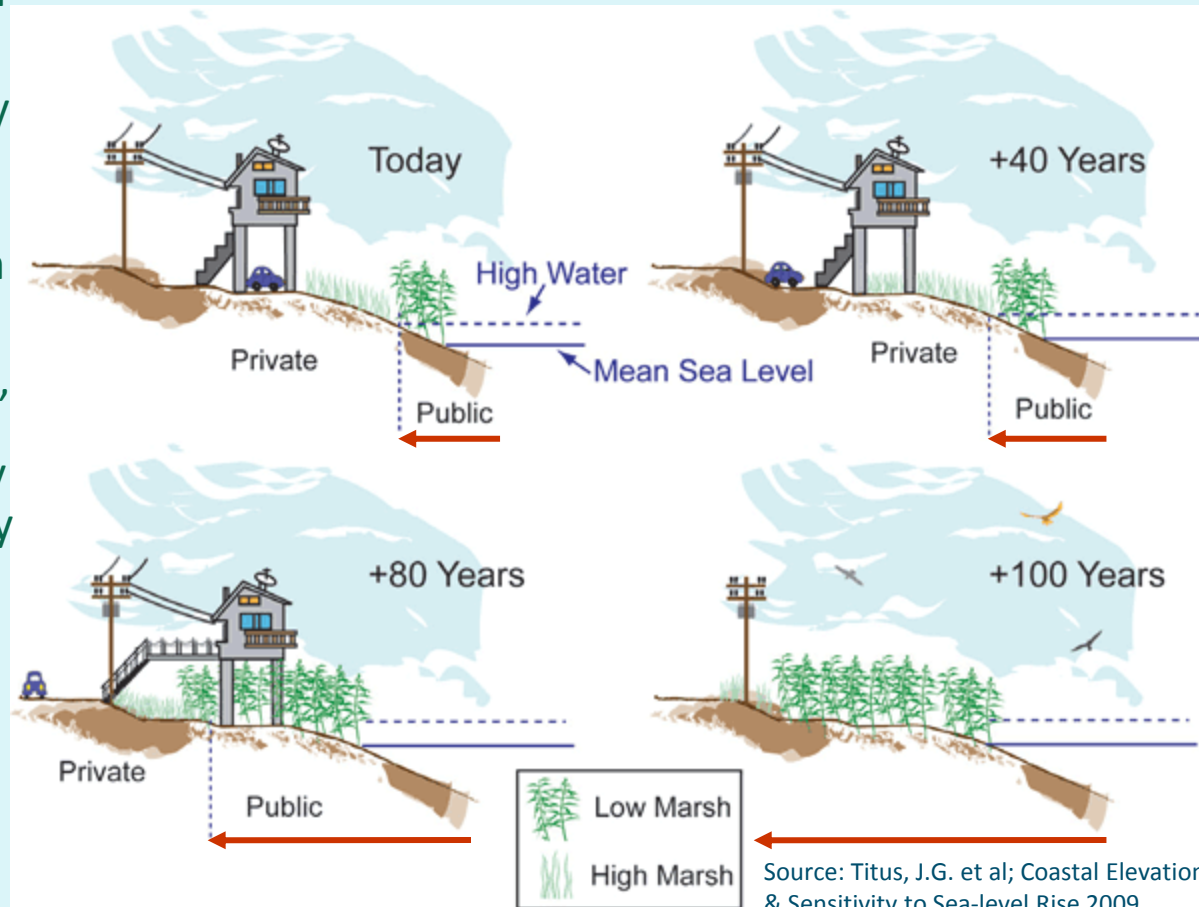
Resilient Growth & Retreat: “Rolling” Easements

Accounts for sea level rise by creating...

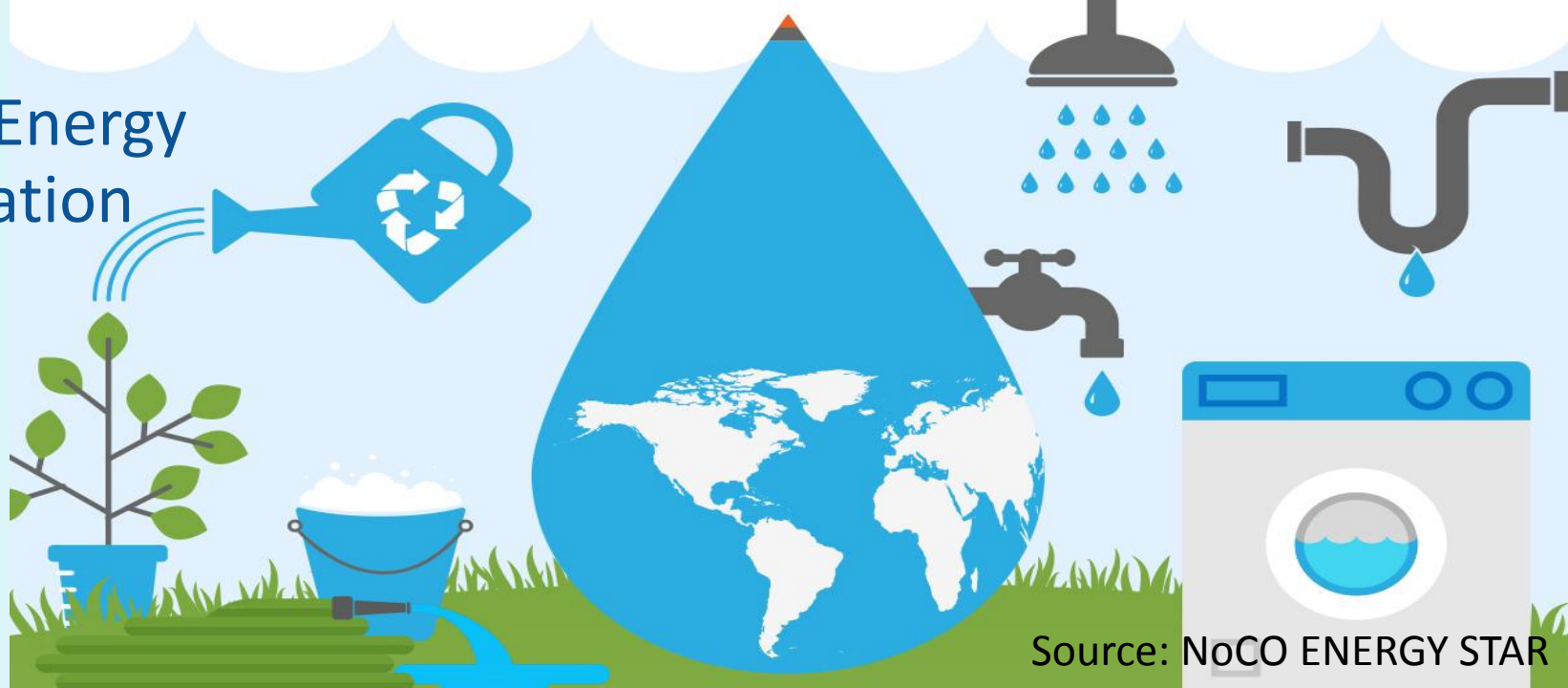
1. New Regulation:
 - a. Revised zoning map that designates protection, adaptation, or retreat for each land use type
 - b. Shore Protection Overlay Zone delineating new zoned areas for retreat, adaptation, & protection

OR...

2. “Recorded Rolling Easement:”
 - Contract between property owner & Land Mgmt. Entity with easement rules (e.g. no protection structures)
 - Property right transfer to LME



Water / Energy Conservation



Source: NoCO ENERGY STAR



Source: United Utility Services

Green Infrastructure

Coastal Shoreline Continuum Ideal & "Living Shorelines" Treatments



Graphic courtesy Burke Environmental Associates

Riparian
Vegetation
Management
Bank Grading
Fiber Logs

**Tidal Marsh
Enhancement**
Tidal Marsh Creation
Beach Nourishment &
Dune Restoration
Marsh Toe Revetment
Marsh Sill
Marsh with Groins

Living Breakwater
Offshore Breakwater System
Oyster Reefs

Source: VA CZM



MAPC Strategic Plan

Priority D: “Help the region reduce greenhouse gas emissions and adapt to the physical, environmental, and social impacts of climate change and natural hazards.”

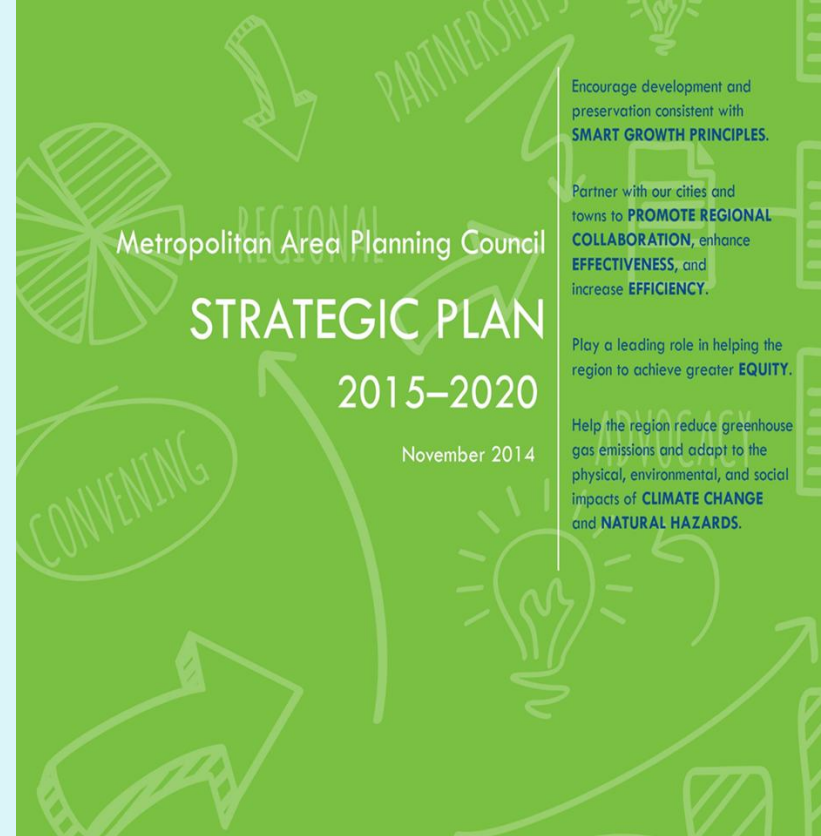
D.1: Work with municipalities to help them become more resilient in the face of climate change

- ✓ Template for muni & multi-muni climate adaptation/mitigation plans
- ✓ Climate resiliency toolkit based on the RCCAS strategies

D.2: Apply a “climate lens” to all projects by integrating climate adaptation/mitigation

D.3: Develop, house, and disseminate climate data and analysis that support state, regional and local efforts

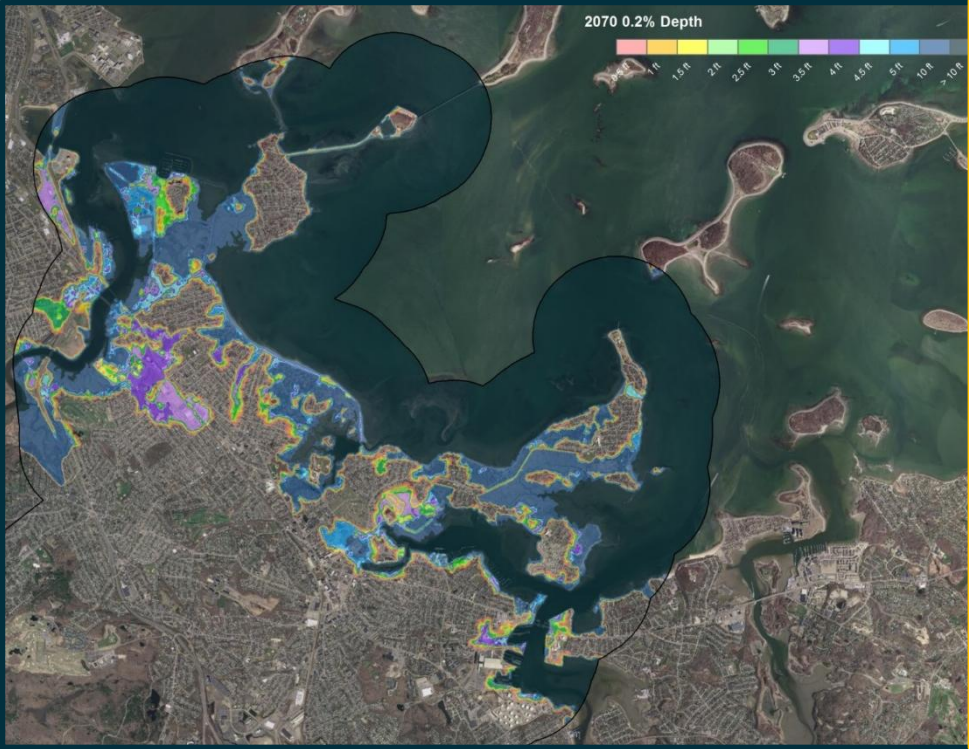
- ✓ Create a methodology for municipal baseline GHG inventories
- ✓ Develop a “Climate Common” clearinghouse for high quality environmental, energy, and climate data



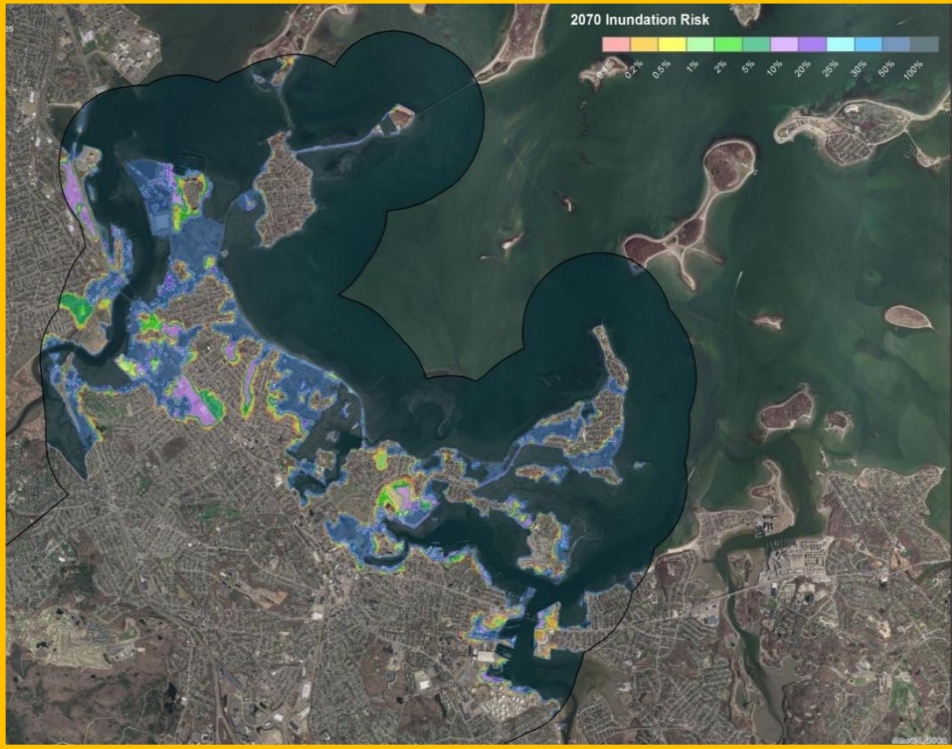
Resilient Quincy Project: Pilot - MA DOT/FHA Boston Harbor Model



Depth of Inundation



Exceedance Probability



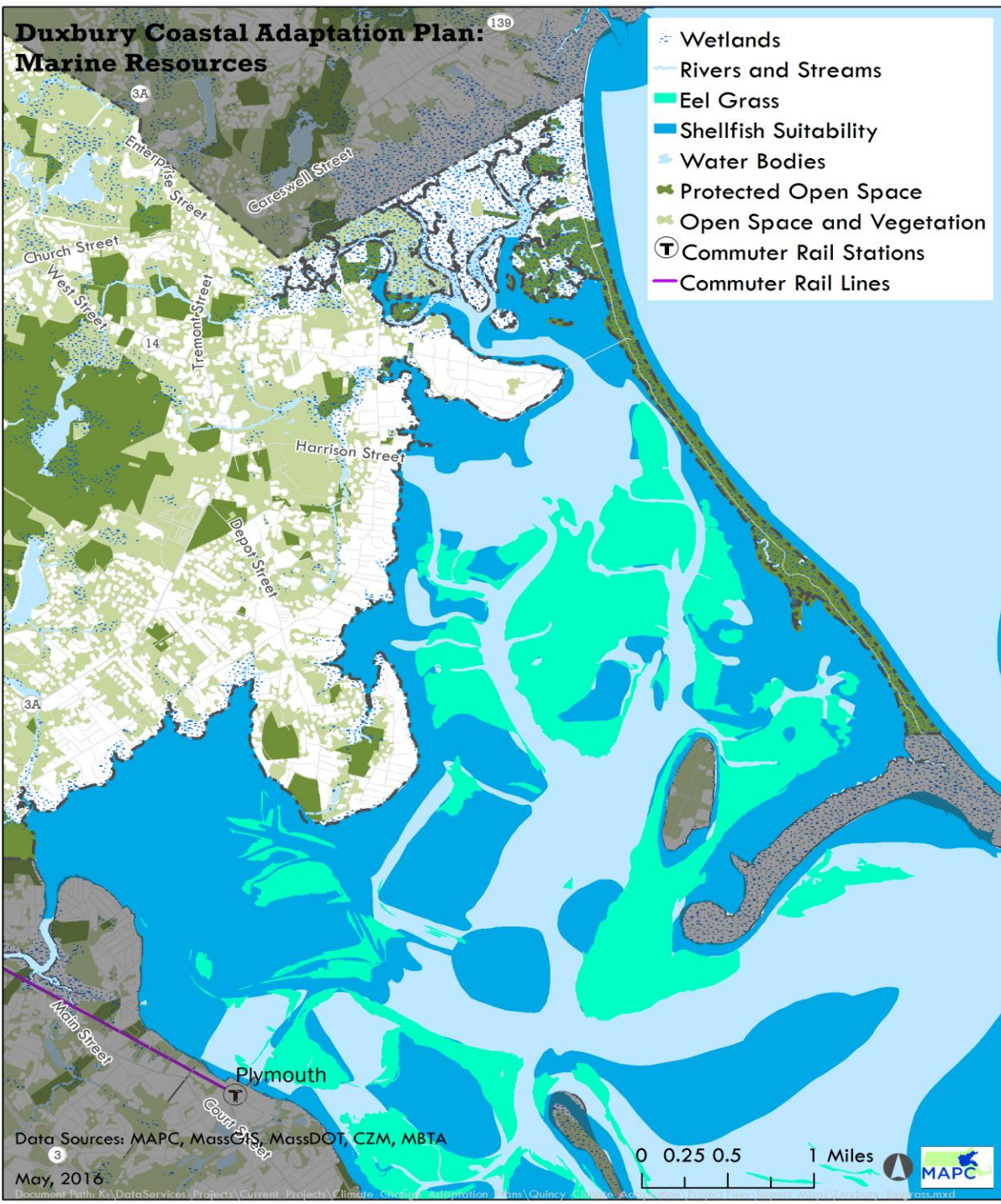
Source: Woods Hole Group

Draft Scituate-Duxbury Resiliency Plan: Economic Impacts



- Over 70 acres under cultivation,
- More than \$8.5M oysters harvested,
- \$4.9M landed value

Duxbury Coastal Adaptation Plan: Marine Resources



“Climate Lens”

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Boxborough2030

Boxborough's Vision: A Rural, Engaged Community For All



Boxborough shall maintain its traditional values of rural open space, a first-rate educational system, agricultural and conservation lands, and historical roots, while fostering a balanced economic environment and enhancing a close-knit sense of community for all generations.

The Boxborough2030 Master Plan provided an excellent opportunity for our town to develop a long-term vision for the community and to create steps for implementing this vision. The last Master Plan for Boxborough was completed in January of 2002. After 13 years it was time to update it. Town staff, the Master Plan Update Committee (MPUC), and the Metropolitan Area Planning Council (MAPC) have produced an updated Master Plan for the Town entitled Boxborough2030. This updated Master Plan will serve as Boxborough's planning guide for the Town over the next fifteen years, through 2030. Moreover, it will help Boxborough achieve and maintain its vision of "A Rural, Engaged Community for All."





Coalitions

Metro Mayors Coalition

