

Opportunities for Salt Marsh Migration on Cape Cod

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Jo Ann Muramoto Ph.D. and Carl DePuy
Association to Preserve Cape Cod



Goals / Objectives

1. This project assumes salt marshes will protect against storm surges and sea level rise, if they can keep up with sea level rise by migrating landward.
2. Identify and prioritize salt marshes that are the best candidates for restoration and protection based on their ability to migrate landward as sea level rises.
3. Identify artificial and natural barriers to marsh migration.
4. Take into account low-lying properties at 2 feet of sea-level rise.
5. Provide information to towns and regional entities to assist in planning for climate change and coastal resilience.

Approach:

1. Cape Cod Commission's sea-level rise (SLR) viewer was used to analyze marsh migration potential into open areas

Weir Creek salt marsh, Dennis, MA.



Existing
salt
marsh

A. Current flooding levels at MHHW



Potential
new salt
marsh

B. Flooding levels at 2 feet of SLR. As seawater floods the northern salt marsh and creates open water, seawater also moves into the shrub swamp at the lower right, potentially creating salt marsh.

2. Site visits helped evaluate and verify marsh migration potential.



The abandoned Barros Bog is located adjacent to the Little Buttermilk Bay salt marsh (BN-39). If restored, this abandoned bog could provide open space for future marsh migration.

3. Barriers to salt marsh migration were identified.



Undersized tidal
culverts



Phragmites australis

Low-lying developments and roads are barriers to marsh migration.



Housing developments inundated with 2 feet of SLR on Dyke's Creek in Bourne, MA on the Canal Service Road.

4. Salt marshes were sorted into high, medium and low migration potential by:

1. The amount of open space marshes could move into as sea level rises.
2. The number and types of barriers to migration.
3. The number of properties flooded at 2 feet of SLR.
4. Whether culverts were flooded at 2 feet of SLR.

High Salt Marsh Migration Potential

Showed continuous migration potential up to 6 feet of SLR

Examples:

Herring River, Wellfleet
Pamet River, Truro
Cow Creek, Sandwich
Parkers River, Yarmouth
Mayo Creek, Wellfleet

Cow Creek at 2 feet of SLR, showing potential salt marsh migration area



Medium Salt Marsh Migration Potential

- Relatively less migration potential up to 6 feet of SLR.
- More barriers to future migration
- Culverts flooded at 2 feet of SLR
- More than 5 houses flooded at 2 feet of SLR

Examples:

BN-39: Earthen bog dike on Little Buttermilk Bay

CH-5: Stage Harbor / Champlain Creek

DE-5: Lower County Road / Weir Creek

EA-6, EA-7, and EA-8: Mary Chase Road, Governor
Prentice Road, Route 6A / Abelino's Creek

YA-6: Park Avenue Restriction on unnamed creek

Bog on Little Buttermilk Bay



Current

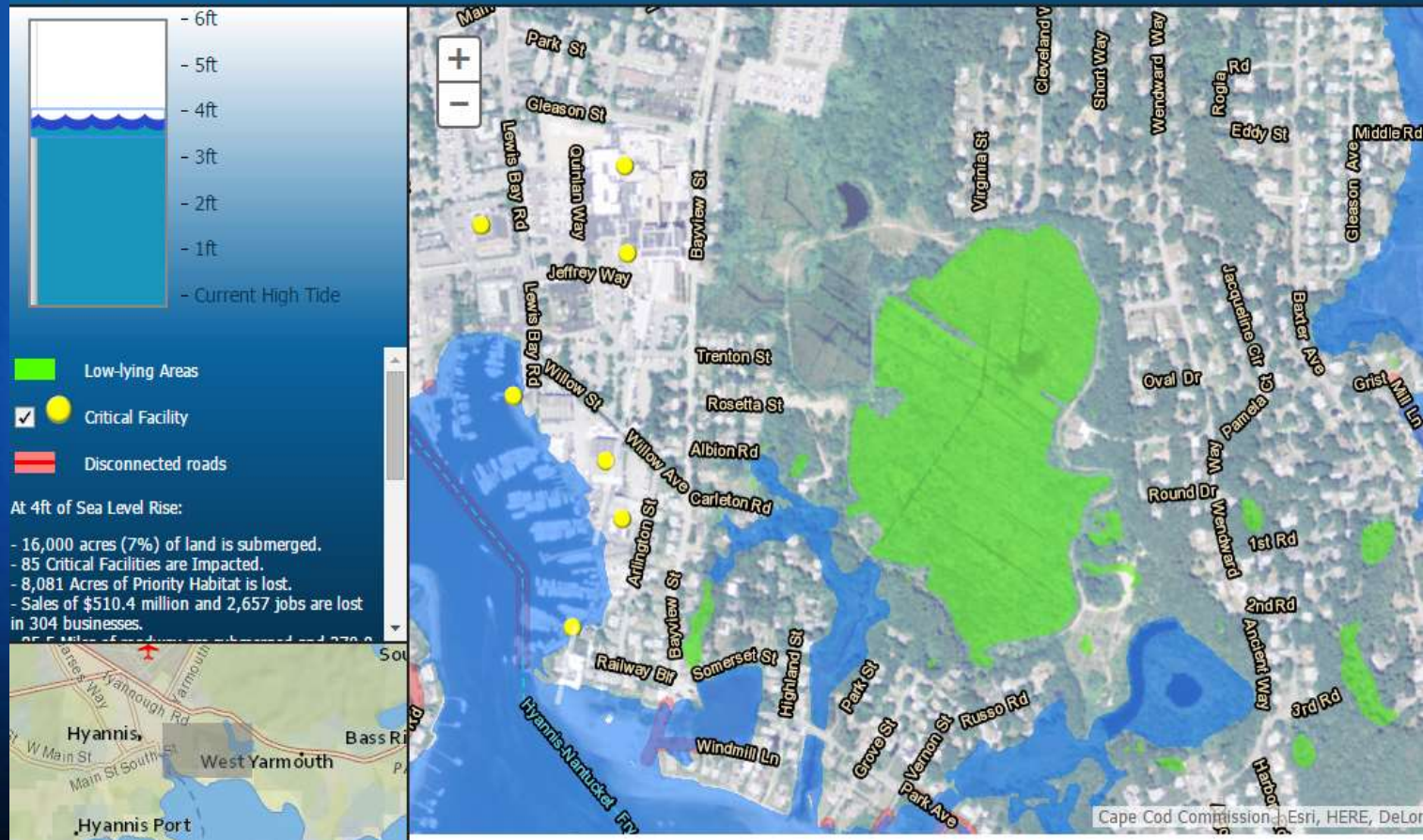


2 feet of SLR



4 feet of SLR

Cape Cod Sea Level Rise



Low Salt Marsh Migration Potential

- Less room to migrate and more barriers to migration

Examples :

BN-08: Gray Gables Upper and Lower Marsh

CH-3: Ridgevale Road / Mill Creek

DE: Cold Storage Road

EA-1, EA-2: Dyer Prince Road

FA: Oyster Pond, Shrub Bog, Little Neck Bay

FA-39: Ravenwood Road / Wild Harbor Boat Basin

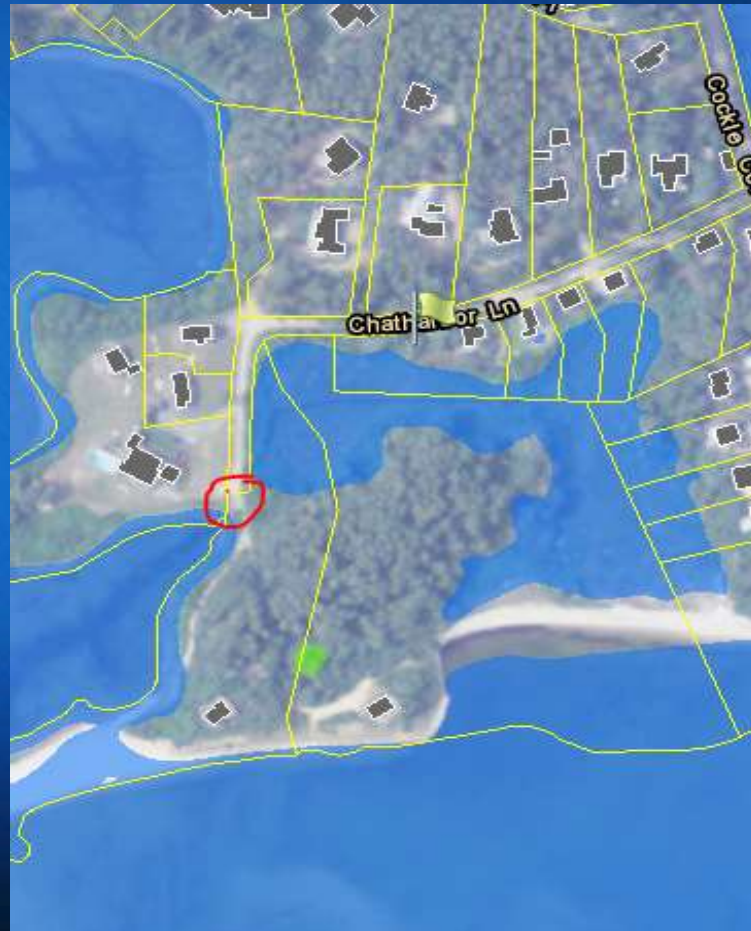
FA: West Falmouth Harbor Watershed

PR-1: The Breakwater / Long Point Dyke

TR: East Harbor Salt Marsh Restoration

YA-10: South Shore Drive / Bass River Beach

Chatharbor Lane restriction in Chatham, MA
has very little migration potential due to
numerous houses



Conclusions

1. Larger estuaries offer greater potential for salt marsh migration.
2. Preservation of floodplain alongside and at the head of estuaries is important.
3. Restoration efforts should take into account the migration potential of salt marshes as sea level rises.