Salt Marsh Adaptation Strategies in Light of Sea Level Rise

Wenley Ferguson
Marci Cole Ekberg

RAE Conference November 2014
Introduction

• Impacts observed and quantified through RISMA and NBNERR
  – Ponded water
  – Barren peat
  – Reduced high marsh habitat
  – Increased mosquito breeding habitat
  – Eroding creek and outer marsh edge
Shallow ponded water

Defined pool in foreground versus shallow standing water

Mosquito breeding habitat
Narrow high marsh along upland edge

Degraded *Spartina alterniflora*

Barren peat
Marsh erosion
Winnapaug Pond Marsh

Marsh migration occurring yet impounded water creating mosquito breeding habitat
Adaptation Strategies

- **In-Marsh**
  - Drainage improvements (small creek excavation)
  - Elevation enhancement

- **Upland**
  - Adopt activities that facilitate marsh migration
  - Change/move land use activities that inhibit marsh migration
  - Remove physical barriers
In marsh adaptation

• Small creeks and runnels excavation
  – Partners include: municipalities, land trusts, Save The Bay and RIDEM Mosquito Abatement Program
  – STB provides project design, permit preparation, organization of volunteers for “dig days”, and restoration monitoring
  – RIDEM provides low ground pressure equipment
  – RI CRMC Habitat Fund and NRCS has provided funding (range from $5K to $15K)
Gooseneck Cove adaptive management

Small creeks dug to drain impounded water
Round Marsh Adaptation

2012
Thin layer deposition projects
Salt Ponds Region Salt Marsh Restoration--$3.25M

- Dept. of the Interior Competitive post-Sandy grant award of $3.25M
- Partners: RI Coastal Resources Management Council, USFWS, Salt Ponds Coalition, Towns of Charlestown and Westerly, Rhode Island, Save The Bay
- Beneficial reuse for marsh restoration at Ninigret Pond, planning for projects in Quonochontaug and Winnapaug Ponds
- Multiple benefits to ecosystem and recreational use
Adaptation Strategies

• In-Marsh
  - Drainage improvements (small creek excavation)
  - Elevation enhancement

• Upland
  - Adopt activities that facilitate marsh migration
  - Change/move land use activities that inhibit marsh migration
  - Remove physical barriers
Marsh Migration Facilitation

Marsh migrating into field

Old farm path impediment to marsh migration into red maple swamp
Change of upland activity

Bike path in marsh area

Mowed marsh area

1995
Colt State Park, Bristol

Bike path relocated in late 1990s and “mow line” moved inland

Marsh after path moved
Infrastructure Removal
End of road retrofit
Marsh migration into existing infrastructure

Potential area to limit vehicular access

Flooding during a moon tide

Ponded water at low tide
Land protection to allow marsh migration
Land protection to allow marsh migration

Salt marsh east of road; land protection of small lots required for road to be closed to vehicular use
Next Steps

- Assess and compare results of runnel and creek excavation through a BACI design
- Design and implement thin layer deposition
- Identify areas for land protection for marsh migration
- Identify adaptive management activities in upland to facilitate marsh migration
Thank You