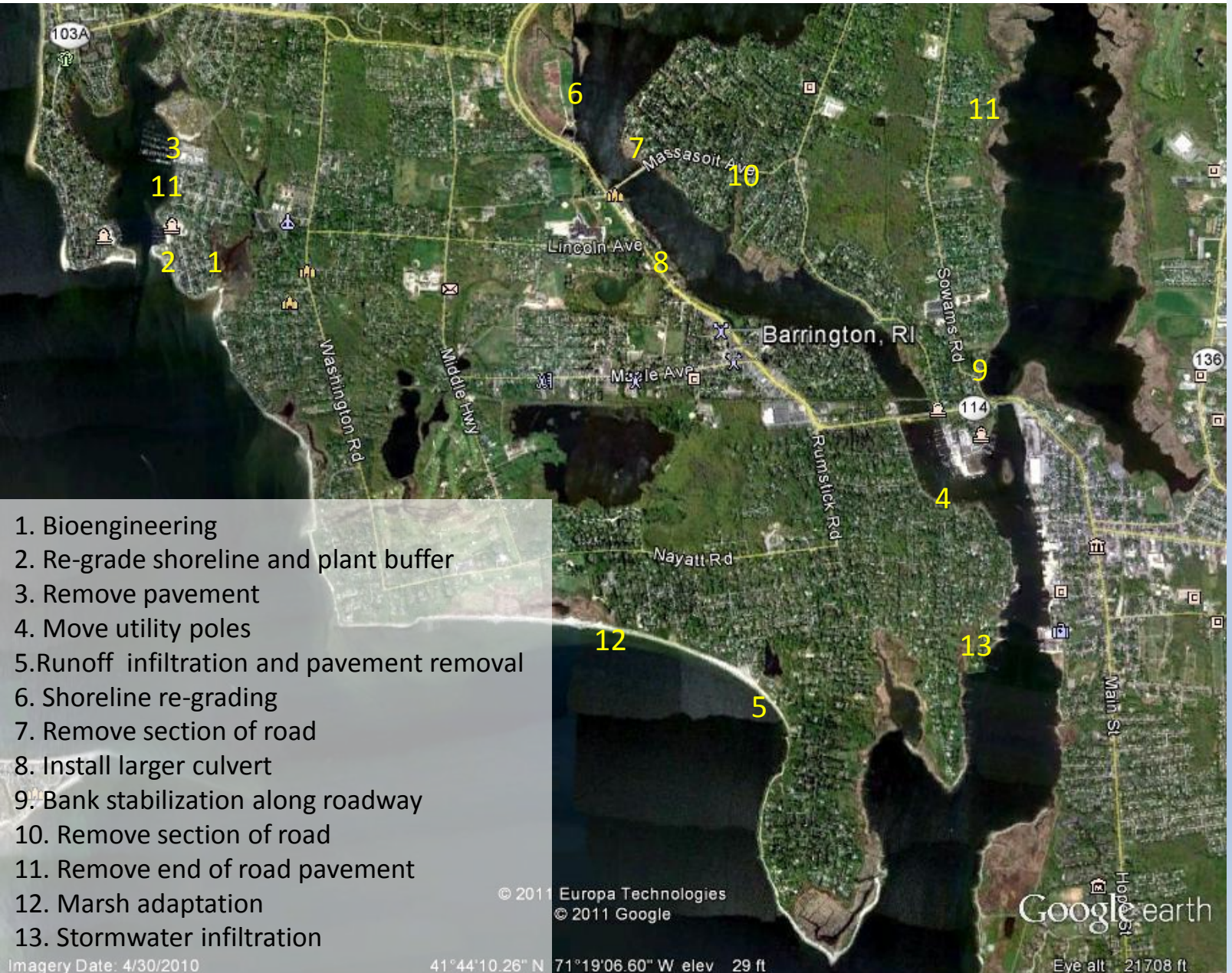
Migrating Shorelines: Opportunities for Coastal Adaptation

Adaptation Strategies

- Regrade banks to create less erosive slopes
- Install non-structural shoreline protection such as coconut fiber “burritos” or coir logs
- Remove eroding or flood prone parking lots/roads and install stormwater treatment
- Restore or create dunes
- Remove infrastructure or modify activities (i.e. mowing) that prevent migration of coastal habitat

Save The Bay Coastal Adaptation Project
Barrington Assessment



City Park Beach, Warwick: shoreline regrading

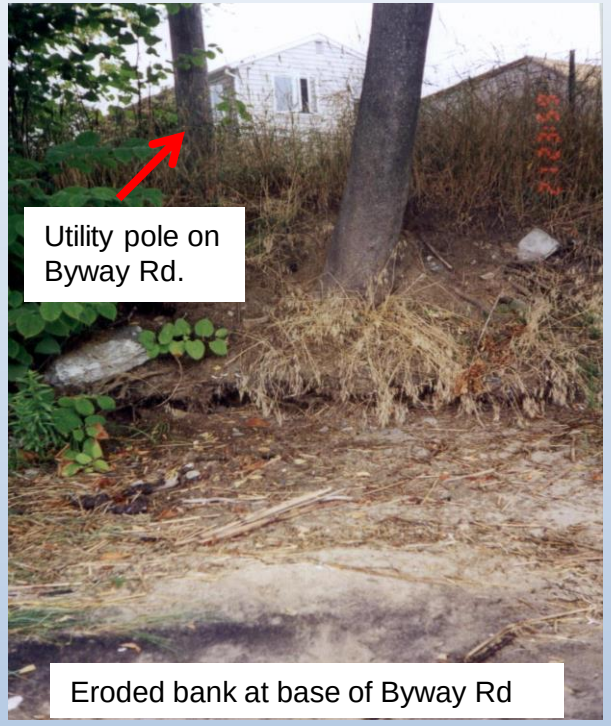
Photo taken 6.10

Photo taken 4.17

Photo taken 9.11

Photo taken 9.12

Allins Cove, Barrington: bank stabilization using non-structural materials



Bank stabilization using coir envelopes

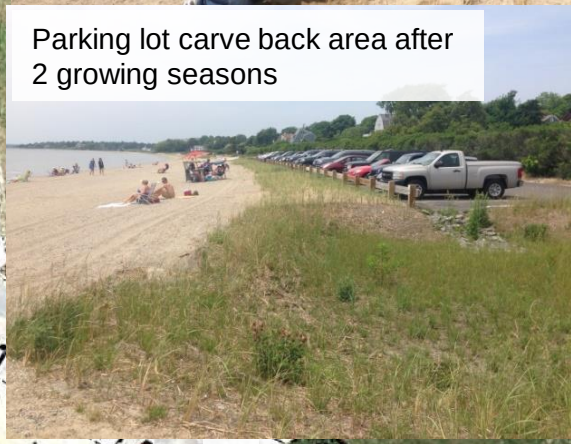
Sowams Road: storm tide photos

Mathewson Road, Barrington: king tide photos

Barrington Beach: parking lot removal and stormwater infiltration

Asphalt being removed

Dune grass planting in former parking



Parking lot carve back area after 2 growing seasons

Erosion of western parking area

Erosion from parking lot runoff

1

Pkg

Lot removed

2

Parking lot edge moved inland along entire length of parking lot

3

1-3: stormwater infiltration areas

Watershed stormwater management and maintenance

Erosion areas

Latham Park: move parking lot inland and infiltrate runoff; repair existing walls to protect infrastructure; enhance buffer along natural shoreline and allow marsh to migrate inland

1: Parking lot edge

2: Natural shoreline area

3: Former marsh area that floods during coastal storms


Latham Park
Latham Park
0
50
100m
USDA FSA, Microsoft | URI EDC, BIGIS |

SHORELINE CHANGE 1939-2003

Rachel E. Hehre and Jon C. Boothroyd

EXPLANATION

DIGITAL SHORELINE ANALYSIS

128 DSAS Transect

Baseline

SHORELINE

High Water Lines

1939

1975

2003

SHORELINE CHANGE

End Point Distance 27.5 ft
8.4 m

End Point Rate 0.4 ft
0.13 m

Scale

0 500 1,000 ft

0 100 200 m

2003 USGS Orthophoto Base

Latham Park adaptation

Parking lot carved back

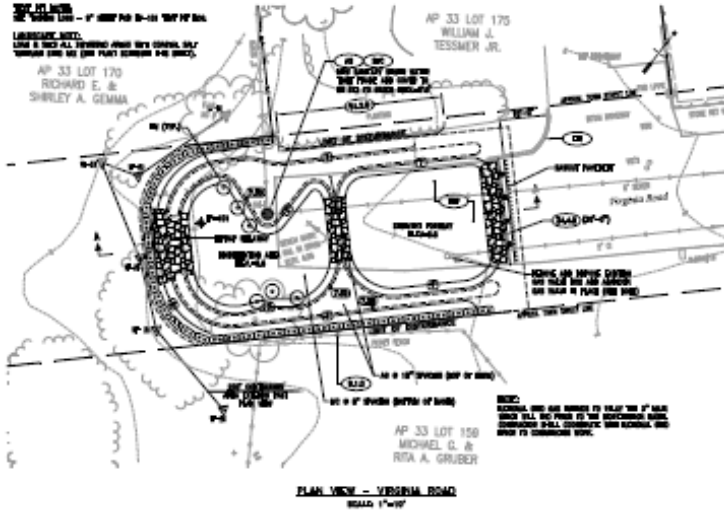
Runoff redirected to bioinfiltration area placed in former parking area

Pre conditions

Latham Park: maintenance and adaptation

End of Road Retrofits

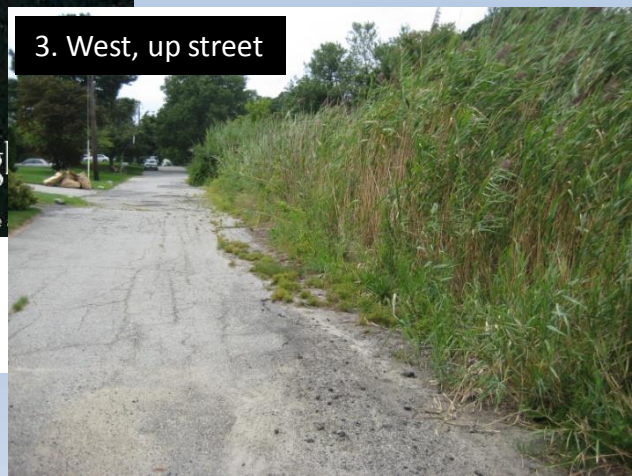
Proposed end of road retrofit to remove pavement and infiltrate stormwater before entering marsh along 100 Acre Cove



Mill Cove Road, Warwick: end of road retrofit and public access enhancement

Woodbine Avenue, Barrington: potential end of road retrofit

Belvedere Avenue, Palmer River



Opportunity for pavement removal, flooding of end of road up to driveway

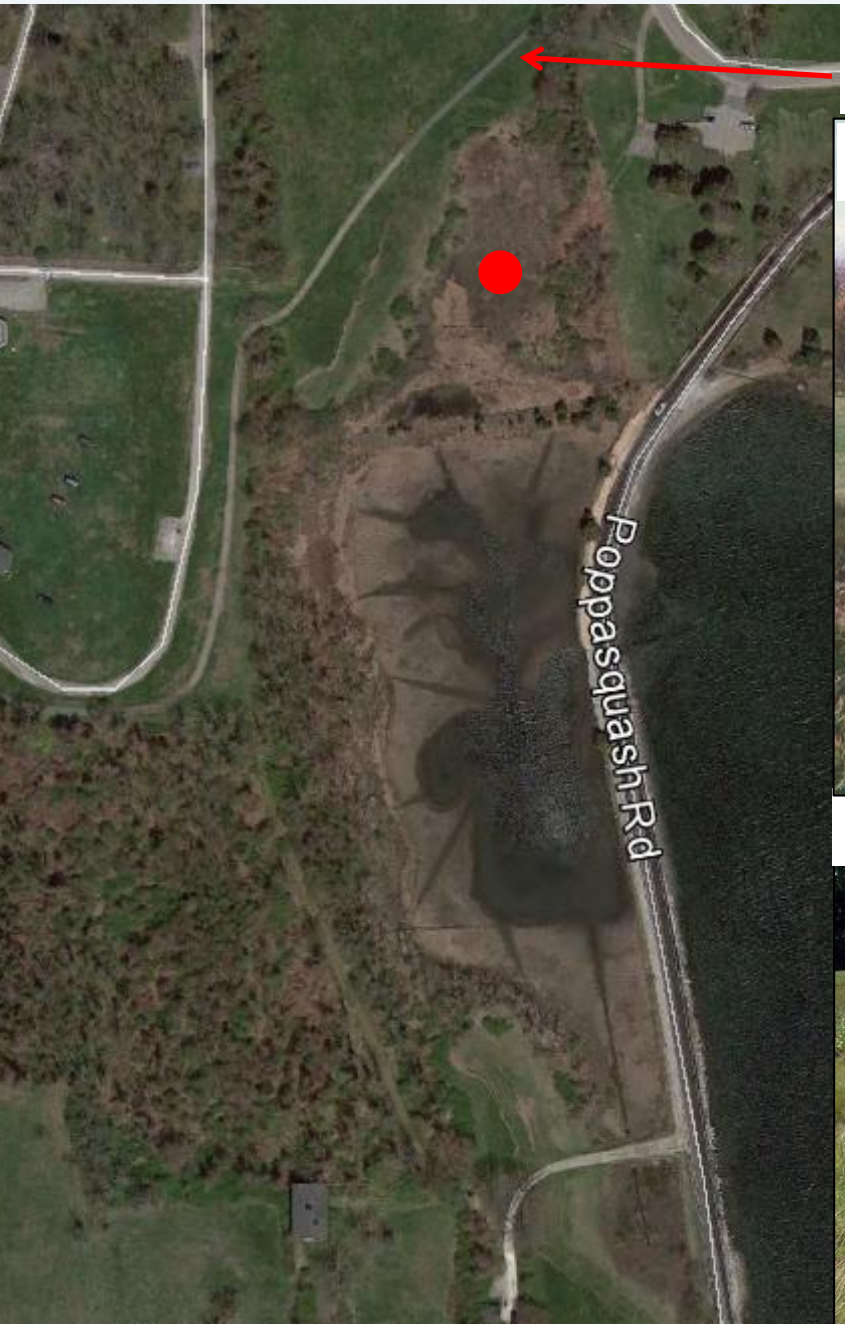

Marsh migration

Infrastructure impediments to marsh migration

Colt State Park

Breen Road, Westerly

Colt State Park, Bristol: infrastructure removal for marsh migration



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

1996: marsh mowed

Marsh after path moved

Marsh migration on Kickemuit River

Palmer/Kickemuit River 1 foot of sea level rise

Kickemuit Dam: 11.15.16

Map 20

1:10,000

0 500 1,000 1,500 2,000 Feet

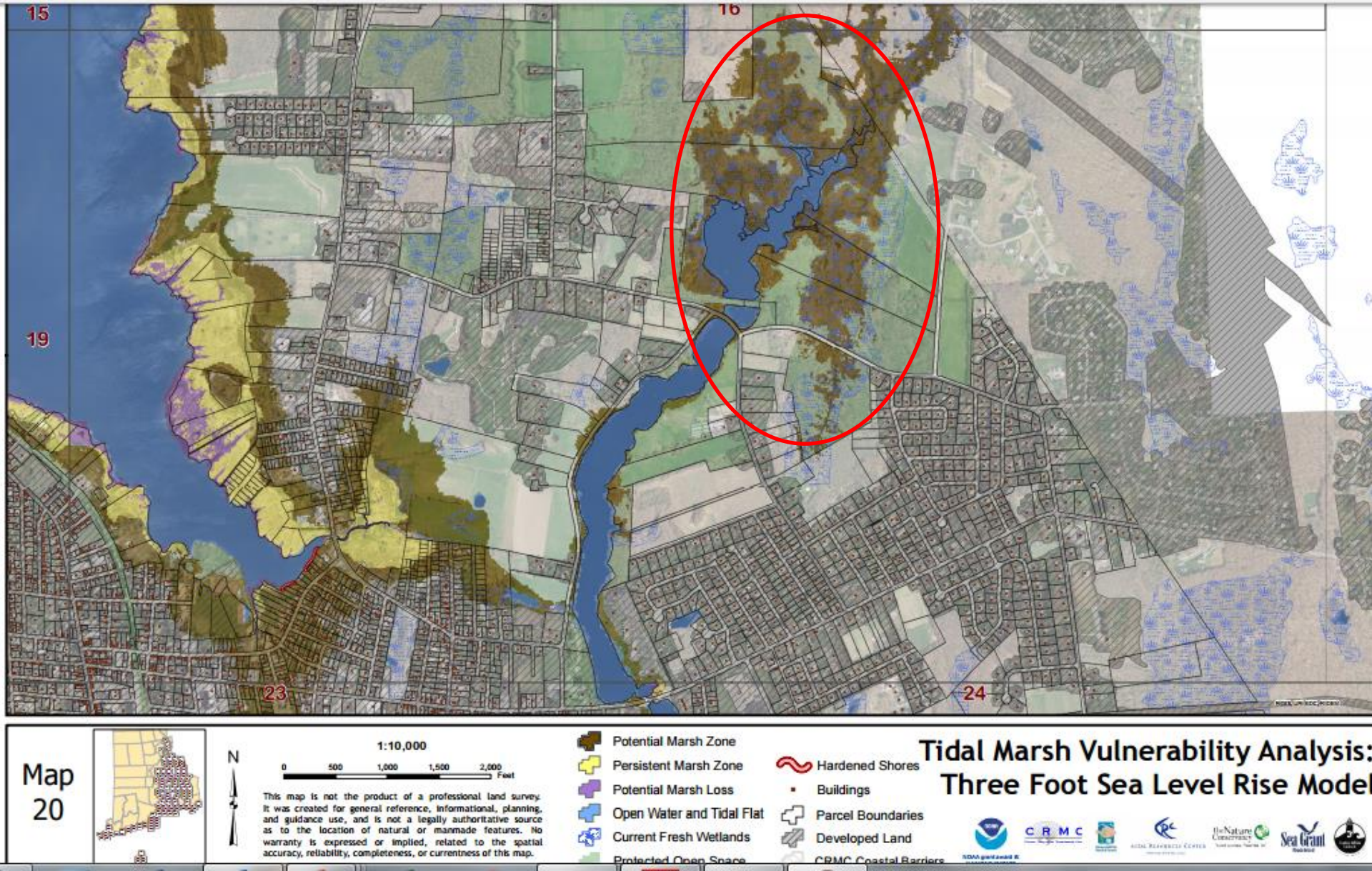
This map is not the product of a professional land survey. It was created for general reference, informational, planning, and guidance use, and is not a legally authoritative source as to the location of natural or manmade features. No warranty is expressed or implied, related to the spatial

- Potential Marsh Zone
- Persistent Marsh Zone
- Potential Marsh Loss
- Open Water and Tidal Flat
- Current Fresh Wetlands
- Hardened Shores
- Buildings
- Parcel Boundaries
- Developed Land

Tidal Marsh Vulnerability Analysis: One Foot Sea Level Rise Model

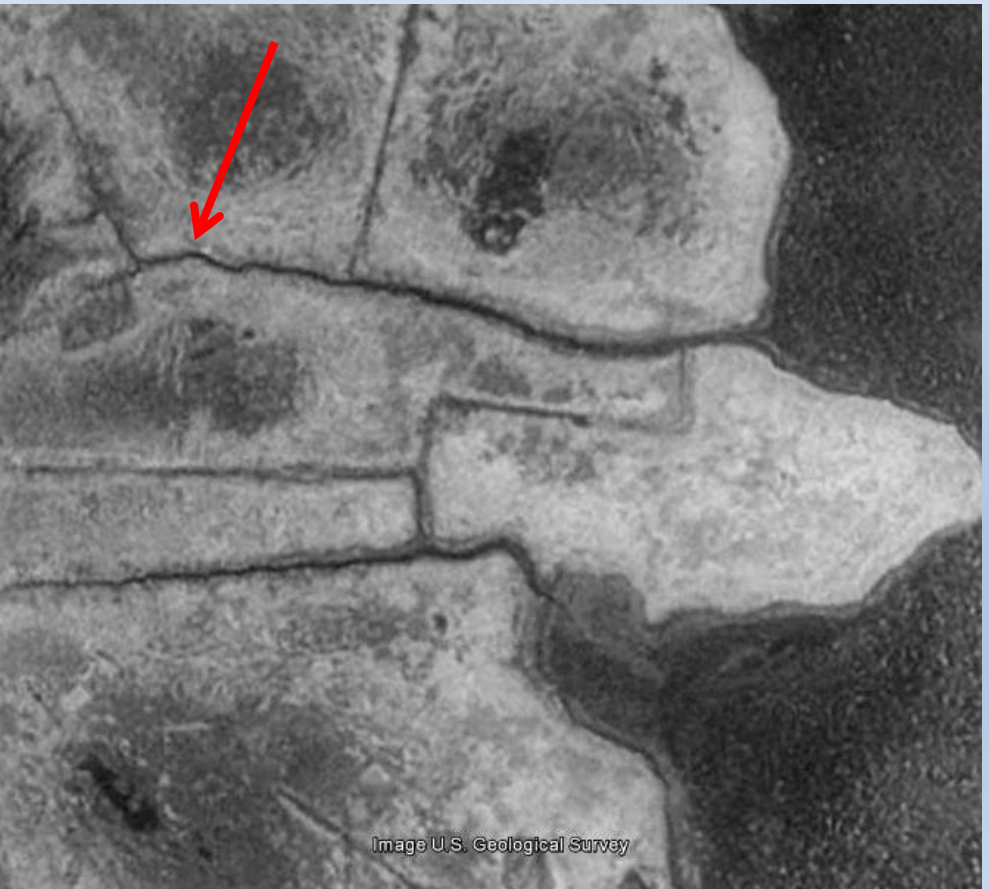
Bristol County Water Supply vulnerability

Palmer/Kickemuit River 3 feet of sea level rise



Shad Factory Pipeline on Palmer River

Marsh Loss: 1995-2016



Barrington Community Garden: Wampanoag Trail

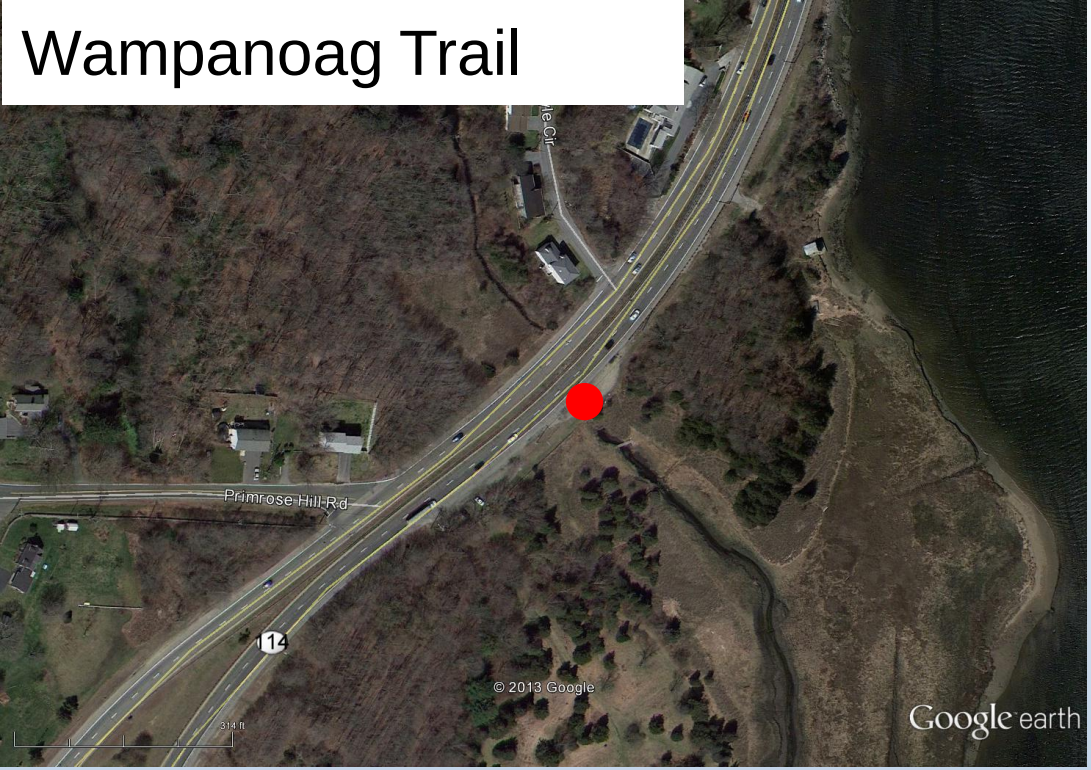
2012

2016

10.27.2011 moon tide

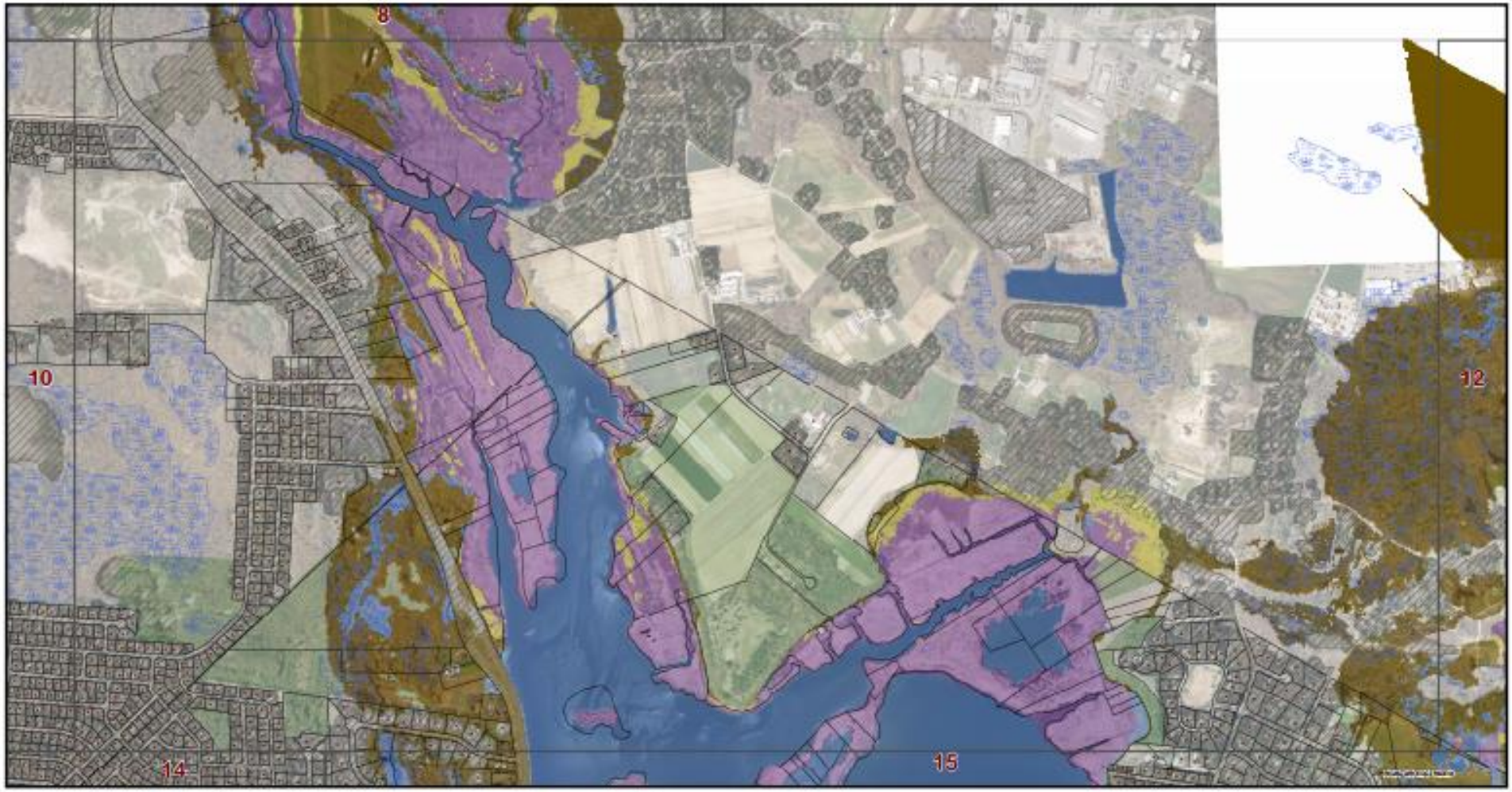
5.24.2017

Wampanoag Trail



10.27.11 moon tide

10.27.11 moon tide



Map 11

N

1:10,000

0 500 1,000 1,500 2,000 Feet

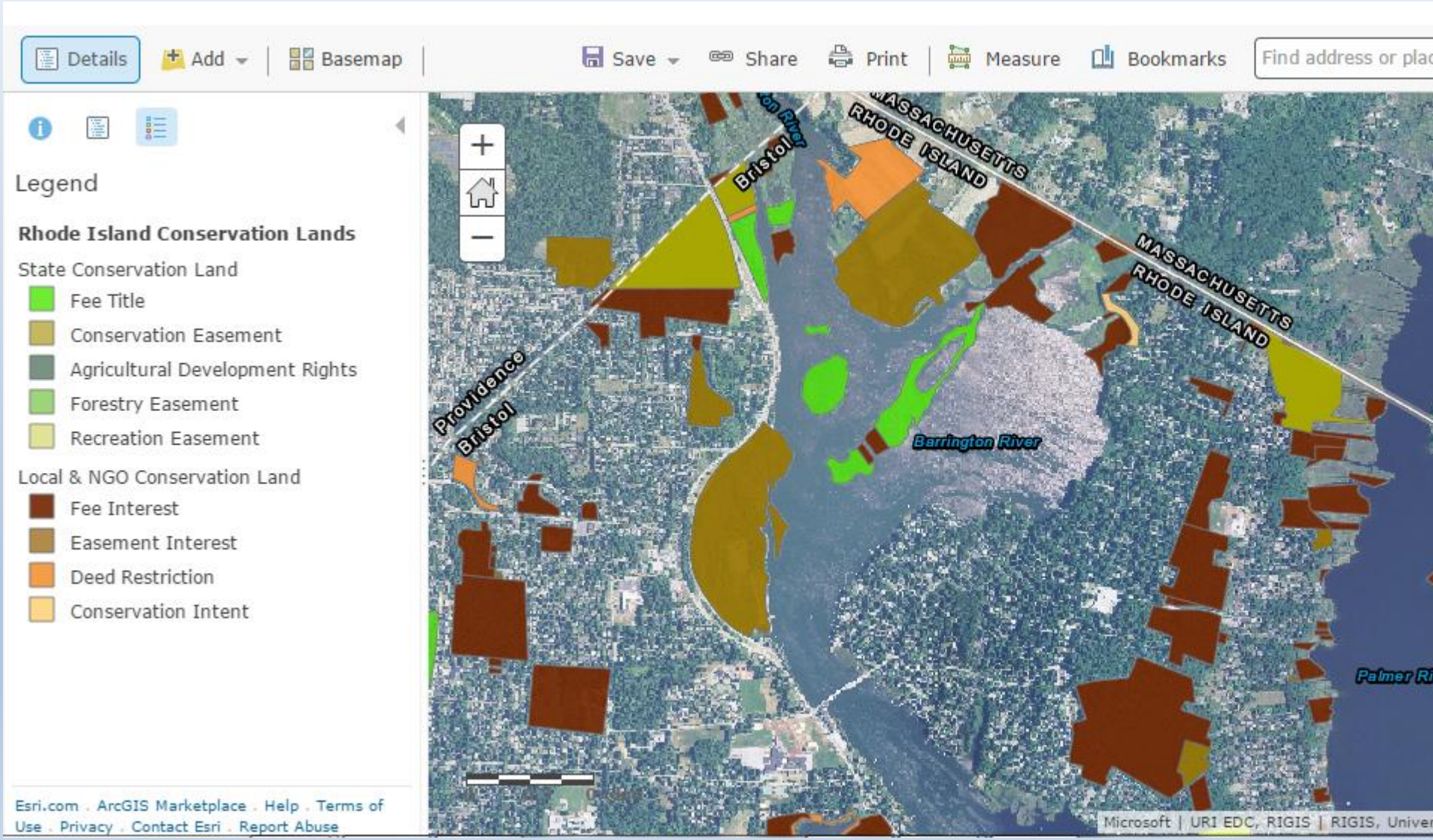
This map is not the product of a professional land survey. It was created for general reference, informational, planning, and guidance use, and is not a legally authoritative source as to the location of natural or manmade features. No warranty is expressed or implied, related to the spatial accuracy, reliability, completeness, or currentness of this map.

- Potential Marsh Zone
- Persistent Marsh Zone
- Potential Marsh Loss
- Open Water and Tidal Flat
- Current Fresh Wetlands
- Protected Open Space
- Hardened Shores
- Buildings
- Parcel Boundaries
- Developed Land
- CRMC Coastal Barriers

Tidal Marsh Vulnerability Analysis: Five Foot Sea Level Rise Model

Map produced by Kevin Ruddock. 4/1/2014

Conservation lands adjacent to Hundred Acre Cove: ArcGIS Online



Walker Farm: marsh migration facilitation

Map 15

N

1:10,000

0 500 1,000 1,500 2,000 Feet

This map is not the product of a professional land survey. It was created for general reference, informational, planning, and guidance use, and is not a legally authoritative source as to the location of natural or manmade features. No warranty is expressed or implied, related to the spacial accuracy, reliability, completeness, or currentness of this map.

- Potential Marsh Zone
- Persistent Marsh Zone
- Potential Marsh Loss
- Open Water and Tidal Flat
- Current Fresh Wetlands
- Protected Open Space
- Hardened Shores
- Buildings
- Parcel Boundaries
- Developed Land
- CRMC Coastal Barriers

Tidal Marsh Vulnerability Analysis: Three Foot Sea Level Rise Model

Map produced by Kevin Ruddock. 4/1/2014

Narrow River, Narragansett: moving mow line inland

RISD Beach Salt Marsh/Dune Restoration

Thank You

NOAA National Oceanic and Atmospheric Administration, US Department of Commerce

CRMC Coastal Resources Management Council

NRCS Natural Resources Conservation Service