

An aerial photograph of a coastal area. In the foreground, waves with white foam are crashing onto a sandy beach. The beach is wide and stretches across the middle of the image. In the background, a house with a dark roof and a chimney is visible, situated on a slight rise. To the right of the house, there is a large, dense green bush or small tree. The overall scene depicts a coastal environment with a residential building.

Review of Sea Level Rise and Storm Surge Adaptation Projects in Rhode Island

Melissa Cote
Watch Hill Conservancy
March 14th 2020

Process



1. Identify the Problem(s)
2. Planning – Engineering/Design
3. Funding & Permitting
4. Implementation
5. Monitoring?

Outline

Barrington:

- Planning Workshops
- Barrington Beach
- Latham Park
- Allins Cove

Newport:

- King Park
- Tide Gate
- Gateway Center
- The Point Neighborhood

South Kingstown

- Matunuck Seawall

Wickford

- Coastal Green and Resilient Infrastructure Project (GRIP)

Terminology



=



Barrington: Planning

2017 – 2019: Mixed-use Demonstration Site



October 2019: Municipal Community Resilience Building Workshop



Town of Barrington Community Resilience Building Workshop *Summary of Findings*



(Credit: Adam Whelchel/TNC)



(Credit: Kim Jacobs/Town of Barrington)

Barrington: Barrington Beach – Before (2011)

Barrington Beach: conditions prior to stormwater infiltration and coastal adaptation project



Barrington: Barrington Beach – Construction (2013)

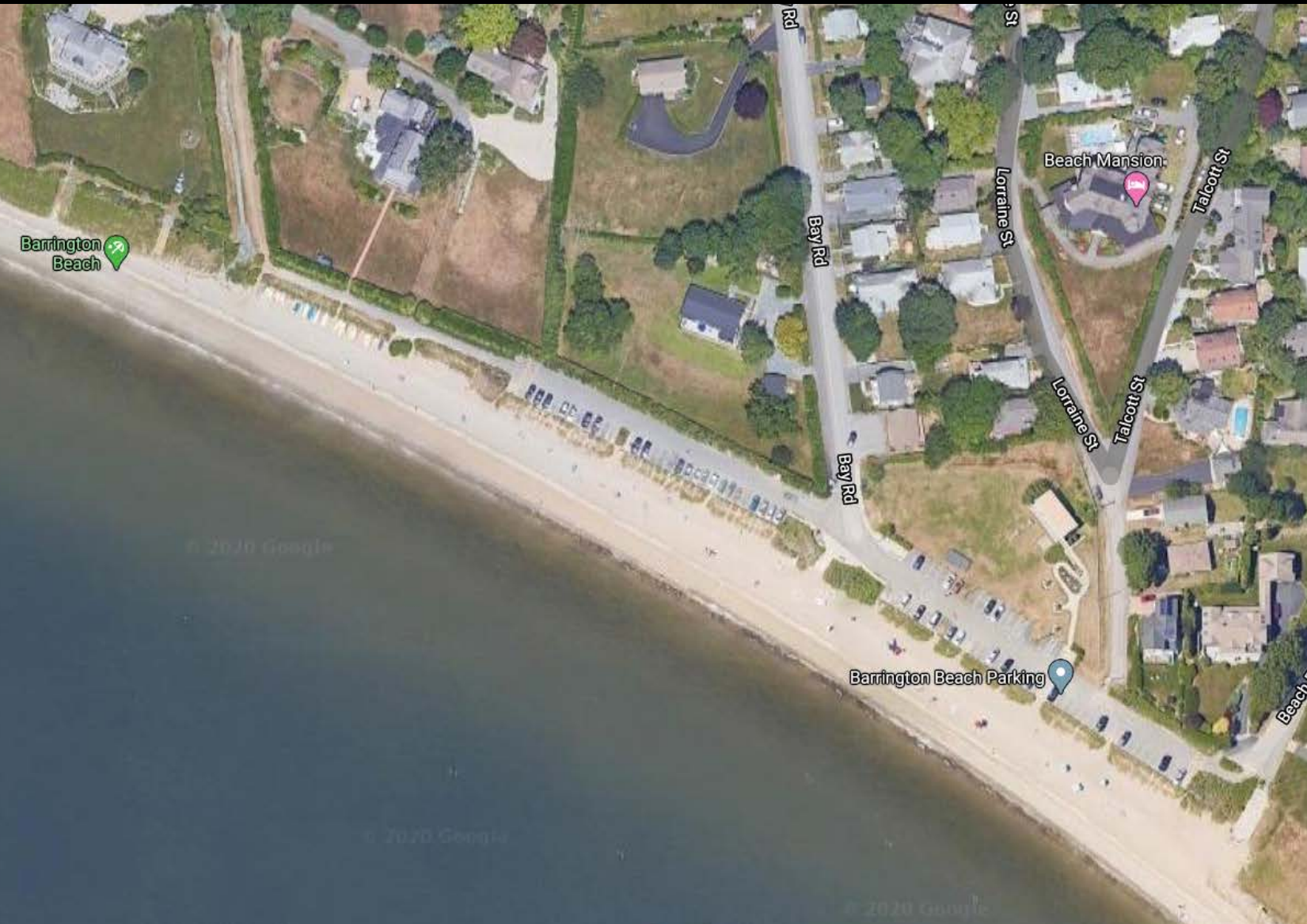
Asphalt being removed



Dune grass planting in former parking area



Barrington: Barrington Beach – After (2014)



Barrington: Barrington Beach – Lessons Learned



Potential Stormwater infiltration area in overflow parking area for Loraine and Talcott stormwater drainage



Barrington: Latham Park

2: Latham Park: allow natural shoreline to erode and low lying area to become salt marsh over time; enhance buffer; opportunity to move parking lot inland and create a filter strip to infiltrate runoff; repair existing walls to protect infrastructure



1: Parking lot edge



2: Natural shoreline area



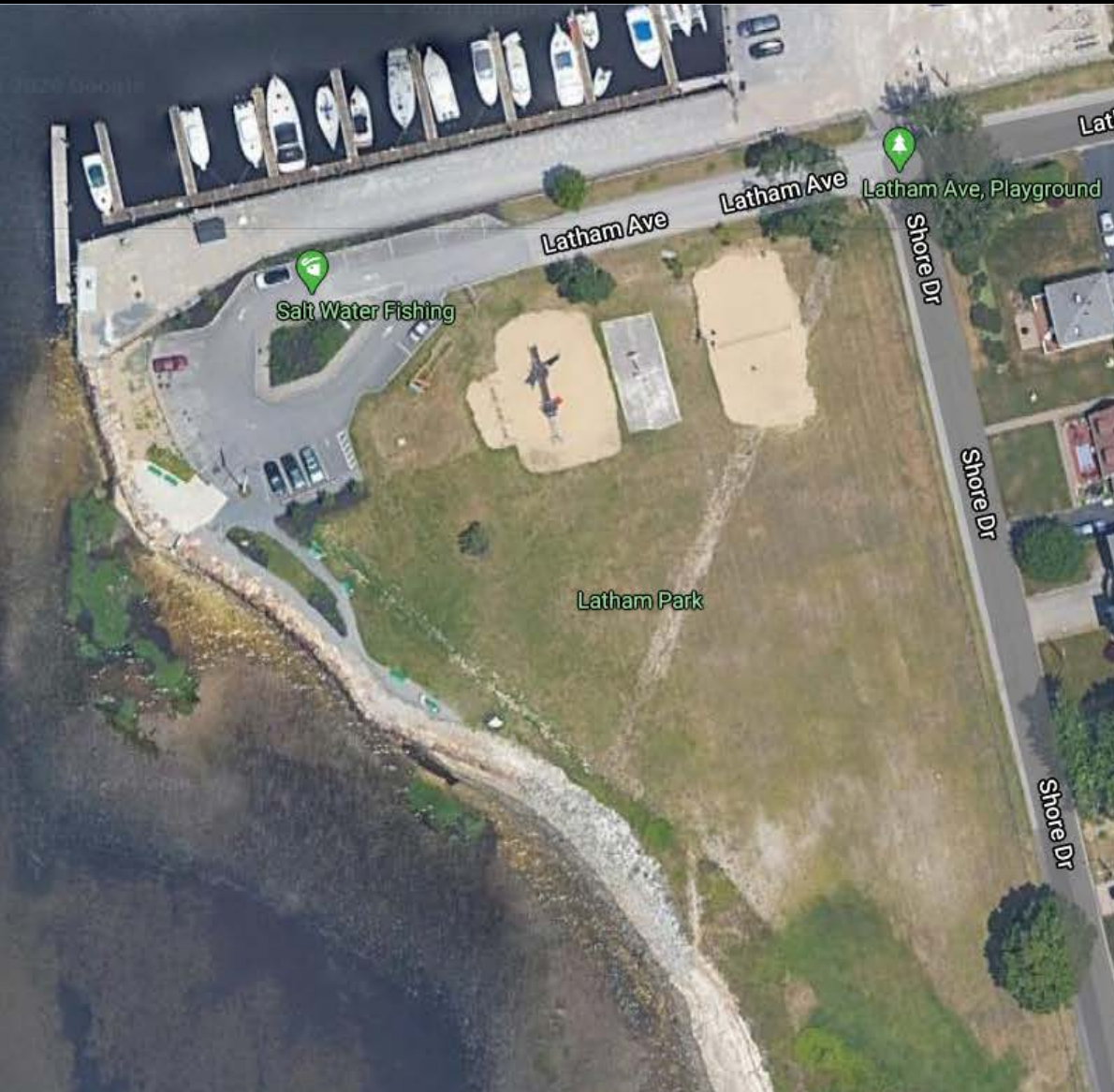
3: Former marsh area that floods during coastal storms



Barrington: Latham Park



Barrington: Latham Park



Lessons Learned:

1. Ongoing Maintenance
 - Build up of sand on lip of infiltration area
2. Stone dust path and benches need to be moved more inland
3. Installing rain gardens in next phase
4. Overall the park is much better than it was

Barrington: Allins Cove



Barrington: Allins Cove



Lessons Learned:

1. One of the coconut coir envelopes needs maintenance, but are mostly holding up well
2. Beach grass planted hold the sand and envelopes in place, helping prevent further erosion
3. Beach grass helps prevent breakdown of envelopes by UV exposure

Newport: King Park Beach – Construction (2014)



Newport: King Park Beach (2017)



Newport: King Park Beach (2018)



Newport: King Park Beach – Lessons Learned?

1. Sediment Grain Size?



2. Beach Grass?



3. Temporary Fix



Newport: Tide Gate

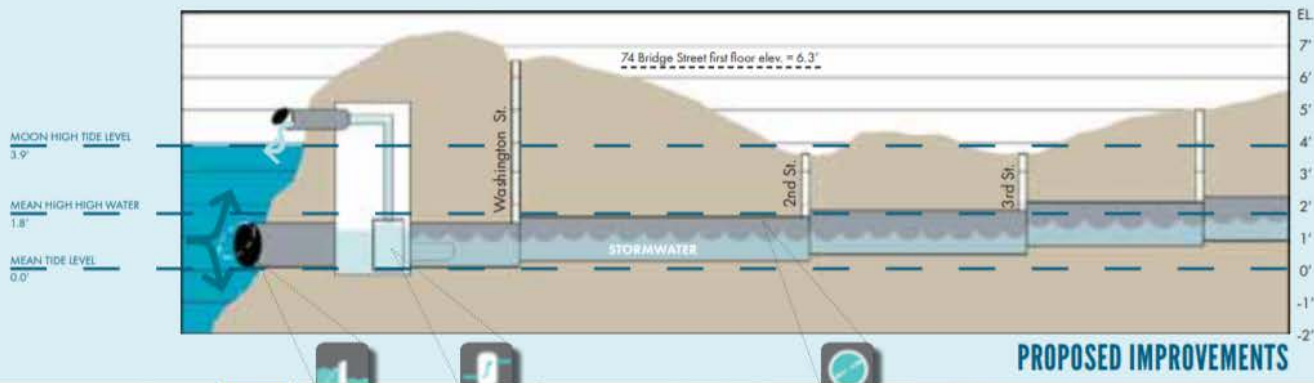
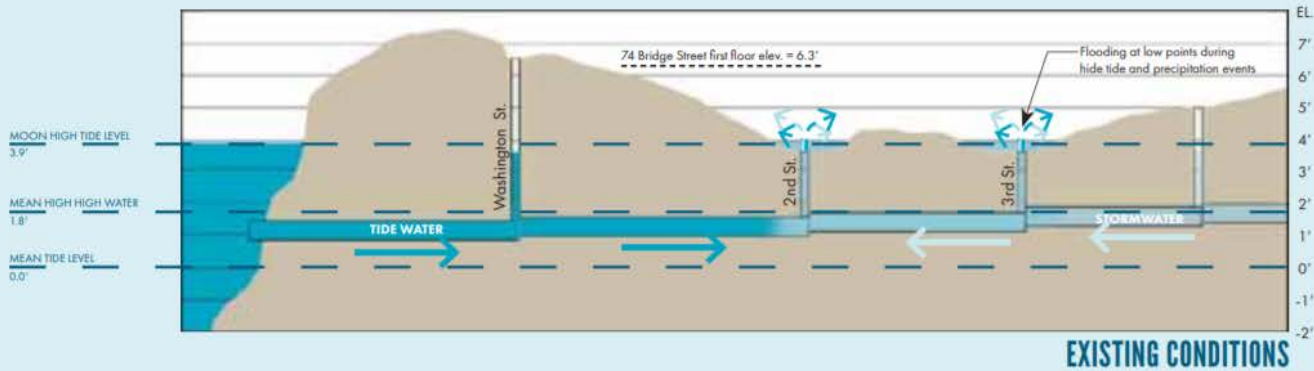


July 1, 2015 – Bridge Street, Newport received $\sim 1 \frac{1}{4}$ " rainfall in 1 hour coinciding with high tide

Intersection of Third Street and Marsh Street during Superstorm Sandy



Newport: Tide Gate



<http://historyabovewater.org/>



Newport: The Point Neighborhood

**KEEPING
74 BRIDGE
STREET**

**ABOVE
WATER**

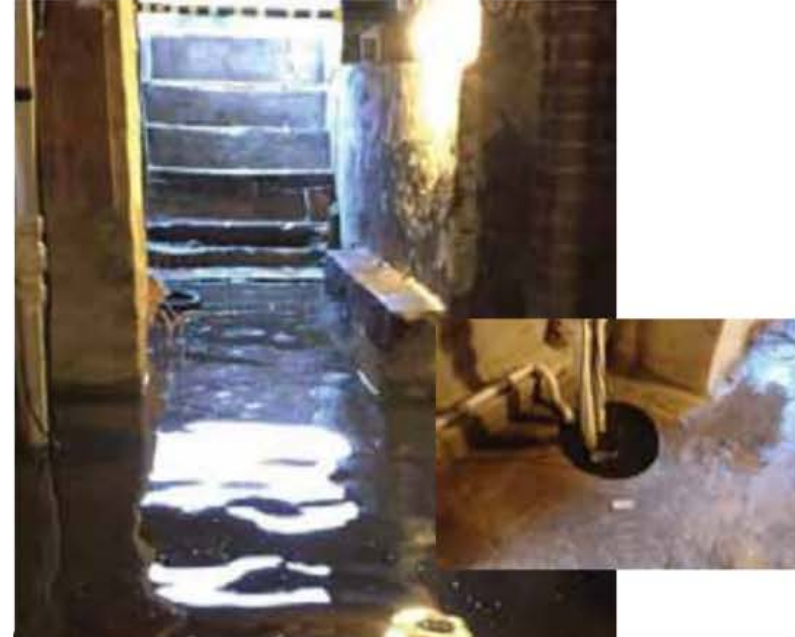


Newport: The Point Neighborhood

Elevated Boiler



Installed two sump pumps



<http://historyabovewater.org/>

Gull Rocks
74 BRIDGE ST. CASE STUDY



Green Infrastructure

What YOU can do at your home to reduce stormwater runoff:

1. **Rain Barrel(s)**
2. Rain Garden/Bioswale
3. Permeable Pavement



Green Infrastructure

What YOU can do at your home to reduce stormwater runoff:

1. Rain Barrel(s)
- 2. Rain Garden/Bioswale**
3. Permeable Pavement



Planted and waiting for rain.



Neighbor (grey house) installs new gutter,



Planted in May, blooming in August.

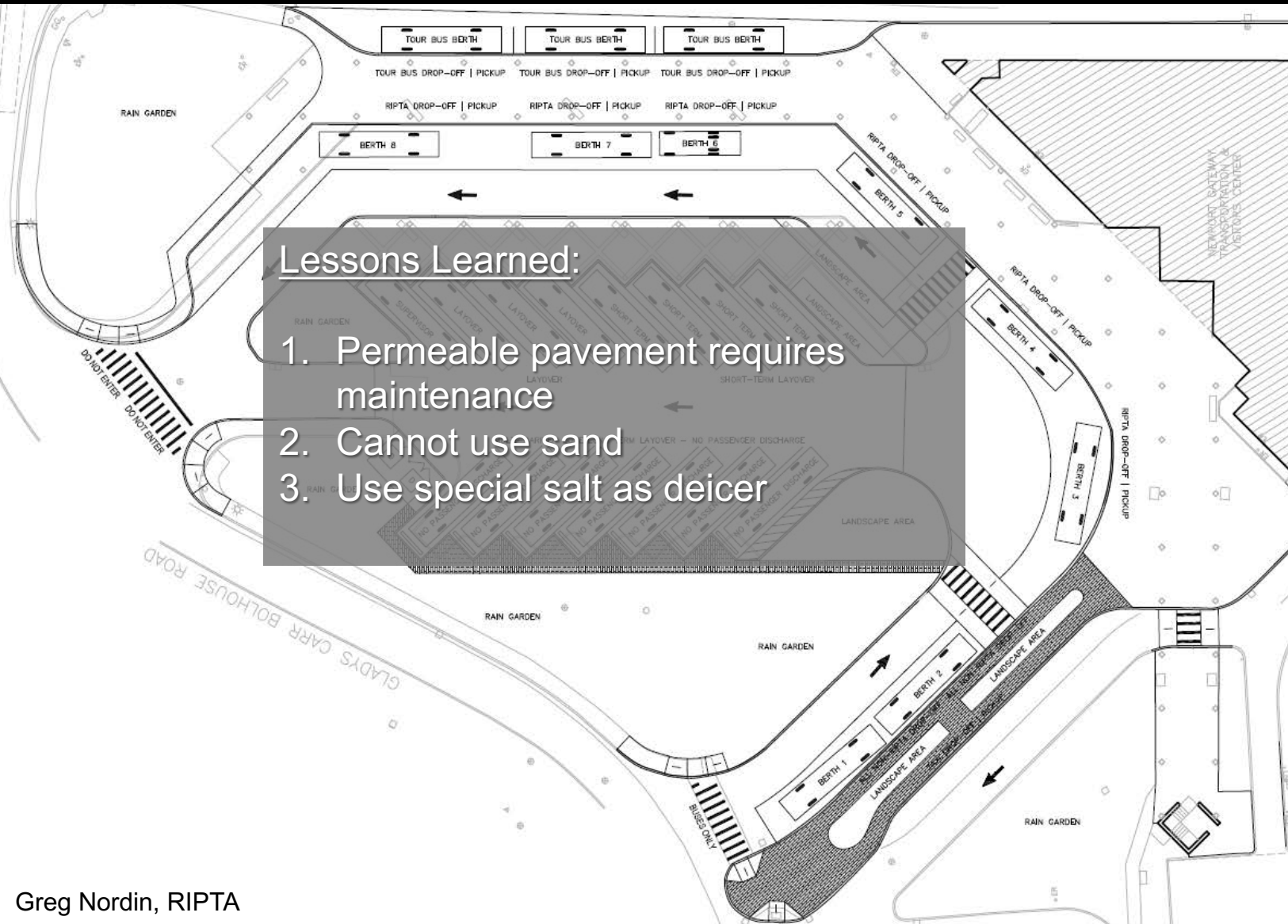
Green Infrastructure

What YOU can do at your home to reduce stormwater runoff:

1. Rain Barrel(s)
2. Rain Garden/Bioswale
3. **Permeable Pavement**



Newport: Gateway Center



South Kingstown: Matunuck Seawall



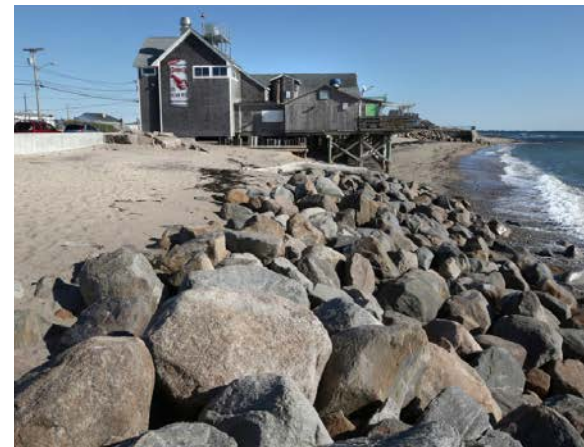
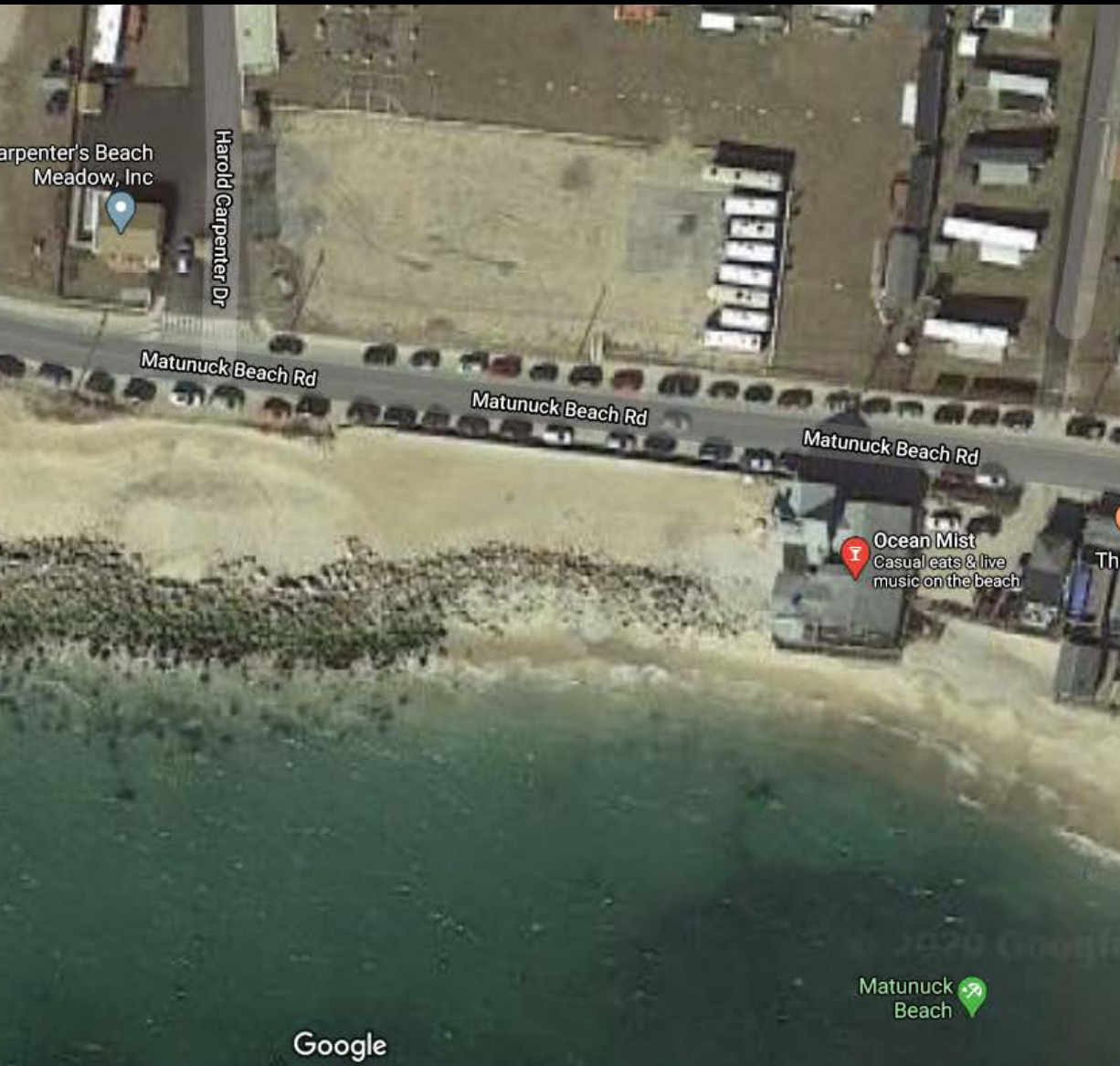
Independent RI/ Michael Derr



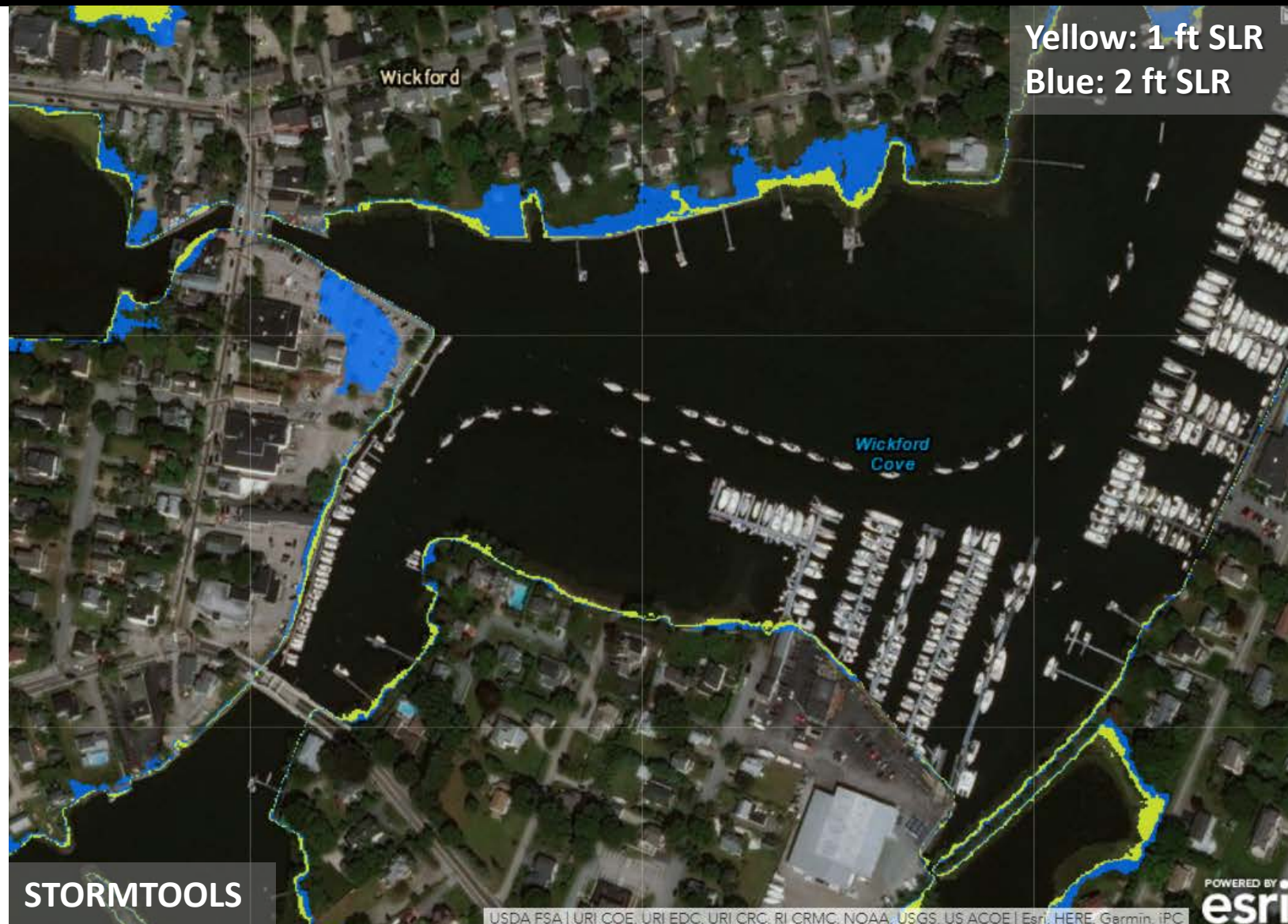
Progressive Charlestown/Tracey C. O'Neil



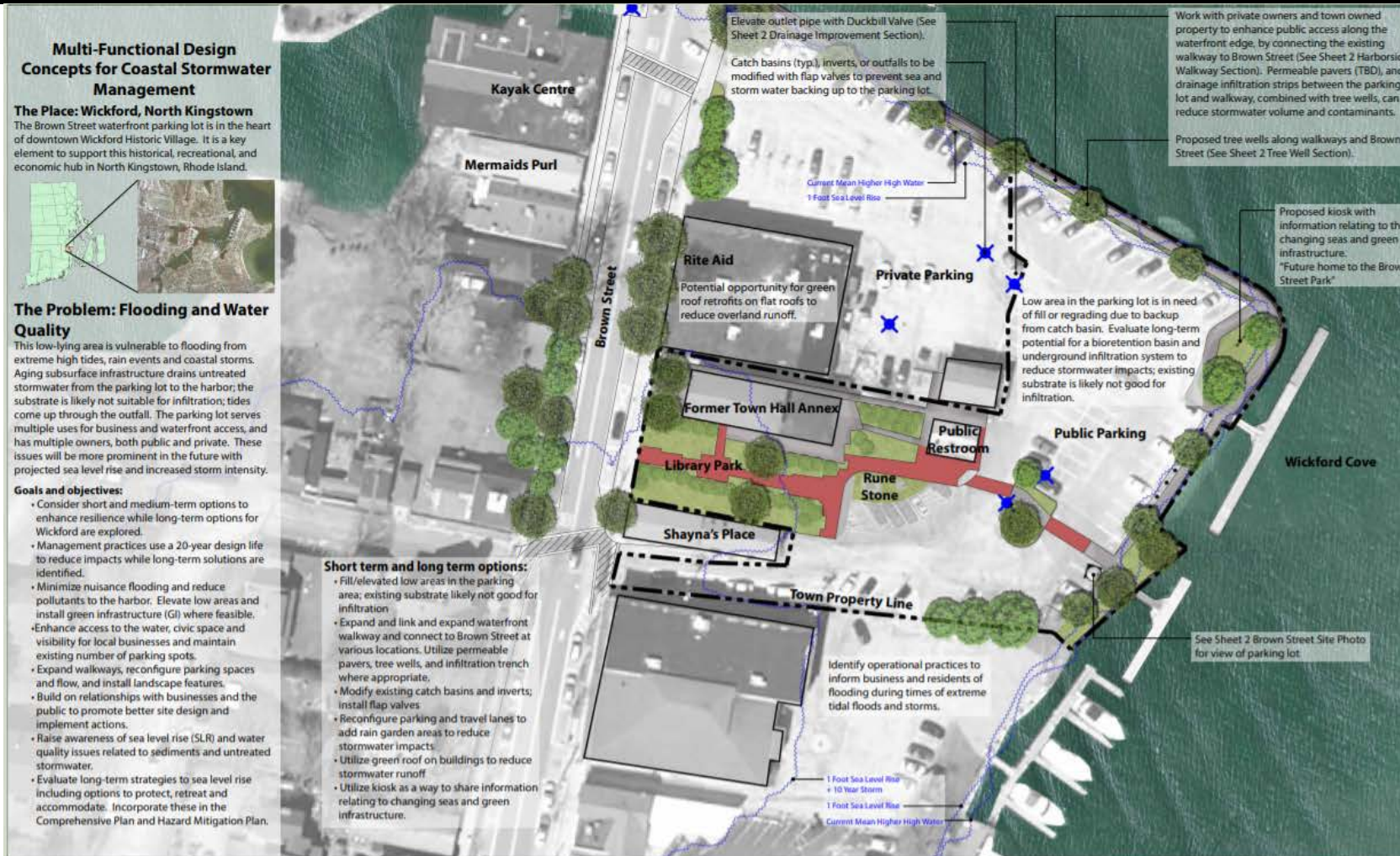
South Kingstown: Matunuck Seawall



Wickford: Brown Street Parking Lot



Wickford: Brown Street Parking Lot



Green and Resilient Infrastructure Planning (GRI/P): Get a GRI/P on RI's Coastline

Funding for this project is provided by the Department of the Interior through a grant from the National Fish and Wildlife Foundation's Hurricane Sandy Coastal Resiliency Competitive Grant Program



Wickford: Brown Street Parking Lot

BROWN STREET LOT

WICKFORD, RI



4 Brown St

NOTES:
*TREES THAT ARE NATIVE TO RHODE ISLAND WILL BE PLANTED AROUND THE SITE AND WILL HELP ENHANCE THE AESTHETICS OF WICKFORD VILLAGE. SOME NATIVES INCLUDE:
-Eastern Red Cedar, *Juniperus virginiana*
-Red Maple, *Acer rubrum*
-Littleleaf Linden, *Tilia cordata*
-Norway Maple, *Acer platanoides*
*ONE-WAY EXIT AND ENTRANCE WILL HELP CONTROL THE CONGESTION OF OUTGOING AND INCOMING OF TRAFFIC.
*SOLAR TRASH BINS AROUND THE SITE WILL HELP ELIMINATE WASTE FROM VISITORS.
*20" STREET LAMPS WILL BE SPARSELY PLACED AROUND THE PARKING LOT.

THE UNIVERSITY OF RHODE ISLAND • Sea Grant • THE UNIVERSITY OF RHODE ISLAND • NFWF

PROJECT BY: BRYNN ARMSTRONG
PREPARED FOR: RICHARD SHERIDAN
LAR 344 - SPRING 2016



CROSS SECTION NTS

FIRST BIOSWALE IN THE LOT TO BE FILLED WITH STORM WATER BEFORE REACHING OTHER BIOSWALES AT THE CAPS OF PARKING AISLES.

RUNE STONE RELOCATED TO THE ENTRANCE OF THE BROWN STREET PARKING LOT TO ATTRACT PEOPLE TO THE PARKING LOT

RITE-AIDS NEW GREEN ROOF WILL HELP STOP RAIN WATER FROM LEAKING THROUGH THE CEILING. THE ROOF TOP IS EQUIPT WITH A PICNIC AREA AND SOLAR PANELS. CRUSHED STONE PATHS WILL ALSO HELP REMOVE ANY CONTAINMENTS FROM RAIN WATER

WATERVIEW WALKWAYS WILL ENTICE THE PEOPLE OF THE COMMUNITY.

AREA FOR DUMPSTERS, DUMP TRUCK WILL TURN TO FOLLOW THE WAY OF THE ROAD AND THEN CAN BACK UP AND COLLECT TRASH FROM THE DUMPSTERS

PARK AREA WITH BENCHES OVER-LOOKING THE HARBOR AS WELL AS PICNIC TABLES. NEW PARK CAN BE USED BY EMPLOYEES OF THE SURROUNDING BUSSINESSES FOR LUNCH BREAKS AS WELL AS THE REST OF THE COMMUNITY.
*BENCHES FACING THE EAST WILL ATTRACT PEOPLE TO SIT AND LOOK OUT ONTO THE HARBOR AS WELL AS THE SUN RISING.

HANDICAP PARKING SPOTS AVAILABLE NEAR THE PUBLIC RESTROOMS AND LIBRARY PARK, AS WELL AS THE NEW WATERFRONT PARK.

NEW DECK CAN SERVE AS A STAGE FOR OUTDOOR MUSIC AND RECREATIONAL EVENTS



Wickford: Brown Street Parking Lot

BROWN STREET LOT

WICKFORD, RI



THIS LOT IS LOCATED AT THE HEART OF HISTORIC WICKFORD AND FUNCTIONS AS THE MAIN LOCATION FOR THE TOWN'S MANY EVENTS THROUGHOUT THE YEAR. ADDING MORE OPEN LAWN SPACE AND CREATING A RIVERFRONT PARK CATER TO THE TOWN'S NEED FOR A MULTIFUNCTIONAL OUTDOOR AREA, GIVING BOTH RESIDENTS AND TOURISTS A PLACE TO REST AND ENJOY THE SCENIC WATERFRONT. THIS PLAN ADDRESSES THE SITE'S CURRENT ISSUES WITH STORM SURGES AND FLOODING, AND ENHANCES ITS ALREADY STRONG FEATURES (SUCH AS THE ANCIENT RUNESTONE, THE ANCHOR SCULPTURE, AND THE SCENERY).

PLANT LIST FOR WICKFORD PARKING:

QUERCUS BICOLOR
PINUS RIGIDA
LIQUIDAMBAR STYRACIFLUA
PRUNUS MARITIMA
SYMPHORICARPOS ALBUS
PANICUM VIRGATUM
CAREX STRICTA



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OF RHODE ISLAND



PROJECT BY: EMILY CONDON
PREPARED FOR: PROF. RICHARD SHERIDAN
LAR 344

BUILT UP GRANITE SEA WALL 2FT AND LOOSE GRAVEL
PEDESTRIAN WALKWAY INCREASES DRAINAGE AND PROTECTS
AGAINST FLOODING

POROUS ASPHALT PAVEMENT, 26" DEEP, HELPS WITH DRAINAGE

ONE WAY VEHICULAR MOVEMENT, SIMPLIFIES CIRCULATION THRU
SITE (95 PARKING SPOTS)

DEPRESSION IN PAVING WITH UNDERGROUND CATCHMENT,
TREATS STORMWATER AND RELEASES IT INTO GROUNDWATER
OVER TIME

EXPOSED AGGREGATE CONCRETE SIDEWALK

ANCHOR SCULPTURE MOVED TO CENTER OF BRICK PLAZA,
FORMAL ENTRANCE TO PARK

RIVER SWALE WITH RIVER ROCKS AND SALT TOLERANT
GRASSES, WOOD PILES IN GRID, EDGED WITH GRANITE

GRASS LAWN GRADED APPROX. 3 FT ABOVE LOT, PITCHING
TOWARDS SWALE SYSTEM AND CATCHMENTS

RUNESTONE GARDEN WITH NATIVE GRASSES, SHRUBS, AND
SIGNAGE RELATING TO WICKFORD HISTORY


PUBLIC DOCKS FOR VISITORS WITH BOATS

WOODEN PILE AND ROPE BARRIER, 3FT TALL

Resources:

- **Shoreline Adaptation Inventory and Design Project (SAID)**
<http://www.crmc.ri.gov/coastalresilience.html>
- **Coastal Green and Resilient Infrastructure Project (GRIP) Interactive Map**
https://www.crc.uri.edu/activities_page/interactive-map-tour-of-coastal-green-infrastructure/
- **Barrington Municipal Resilience Program Community Workshop:**
<https://www.riib.org/sites/default/files/Barrington%20MRP%20CBR%20Summary%20of%20Findings%20-%20Final%20-%20October%202019%20%281%29-compressed.pdf>
- **Barrington and Warren Mixed-use Climate Demonstration Site Report:**
https://static1.squarespace.com/static/546d61b5e4b049f0b10b95c5/t/5e233a7d3e92f95439495562/1579367043560/CI_MixedUseDemoSite_Report_2019.pdf

Acknowledgements

An aerial photograph of a coastal property. On the left, a house with a dark roof and a porch is visible. To the right of the house is a large, sandy area that appears to be a beach or a cleared lot. The ocean is in the foreground, with waves breaking onto the shore. The text is overlaid on a semi-transparent grey box in the center of the image.

Phil Hervey, Director of Planning, Building & Resiliency (Barrington)
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Janet Freedman, CRMC Coastal Geologist
Julia Fogue, Director of the Department of Utilities (Newport)
Greg Nordin, RIPTA's Chief of Strategic Advancement
Teresa Crean, CRMC
Watch Hill Conservancy

Questions?



Jerusalem: Coconut Coir Envelopes



Pictures

- <https://www.newportnow.online/wp-content/uploads/2020/01/City-Seeks-to-Elevate-History-Against-Climate-Change.png>
- Newport/Aquidneck
 - <http://www.greeninfrastructureri.org/newport.html>
 - <http://www.greeninfrastructureri.org/projects.php>
 - <https://youtu.be/sVeyVusfodU>
 - <http://historyabovewater.org/wp-content/uploads/2016/09/74-Bridge-Case-Study-Booklet.pdf>
 - https://www.cityofnewport.com/CityOfNewport/media/City-Hall/Departments/Utilities/Capital%20Projects/WELLINGTON-BRIDGE-Public_mtg_1.pdf
 - King Park: <https://www.newportri.com/5525f6b8-abf7-5150-9ac5-5c633d999ca1.html>
- Wickford
 - <https://mycoast.org/reports/53410>
 - <https://mycoast.org/reports/52178>
 - <https://mycoast.org/reports/52130>
- Coconutfiber Coir: <https://www.mass.gov/files/documents/2016/08/pm/ssp-factsheet-4-coir-rolls.pdf>

Barrington: Walker Farm

6. Walker Farm – Allow salt marsh to become established north of boat ramp; stop mowing marsh; relocate benches inland to allow for erosion.



Ref: Municipal Community Building Resilience Workshop Summary of Findings