

**ADAPTATION
AT THE WATER'S EDGE**
ISSUE 2

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resilientbridgeport.com

RESILIENT BRIDGEPORT



Marsh grass with ribbed mussels (Image Source: Steve Hillebrand, U.S. Fish and Wildlife Service)

! CLIMATE CHANGE

The ability to adapt is critical because climate change, which is affecting Bridgeport and cities around the world. Sea level rise is, in particular, one of the consequences of climate change that is already having a negative impact on coastal communities. The following factors are some of the ways in which climate change and sea level rise are affecting coastlines:

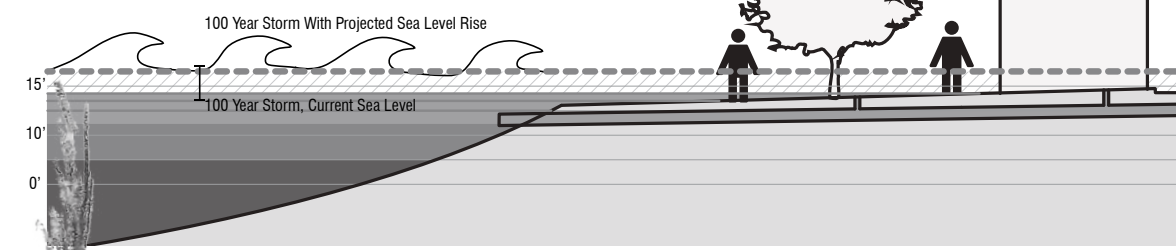
Waves
If sea levels rise 3' feet in the next fifty years, storm surge of 15' will be 18'.

Oceans
Warming oceans and higher sea levels affect global weather patterns and the shape of coastlines.

Ecosystems
Changing temperatures and advancing saltwater change the relationships between nutrients, water, plants, and animals.

Weather
Higher temperatures allow air to hold more water, which means that rainfall may come in greater volumes and/or with greater frequency.

Buildings
Higher groundwater levels, saltwater intrusion, and heavy rainfall may impact the stability of foundations and overwhelm urban water systems.



Groundwater
Rising sea levels pushes subsurface saltwater inland, which affects habitats and drinking water sources.



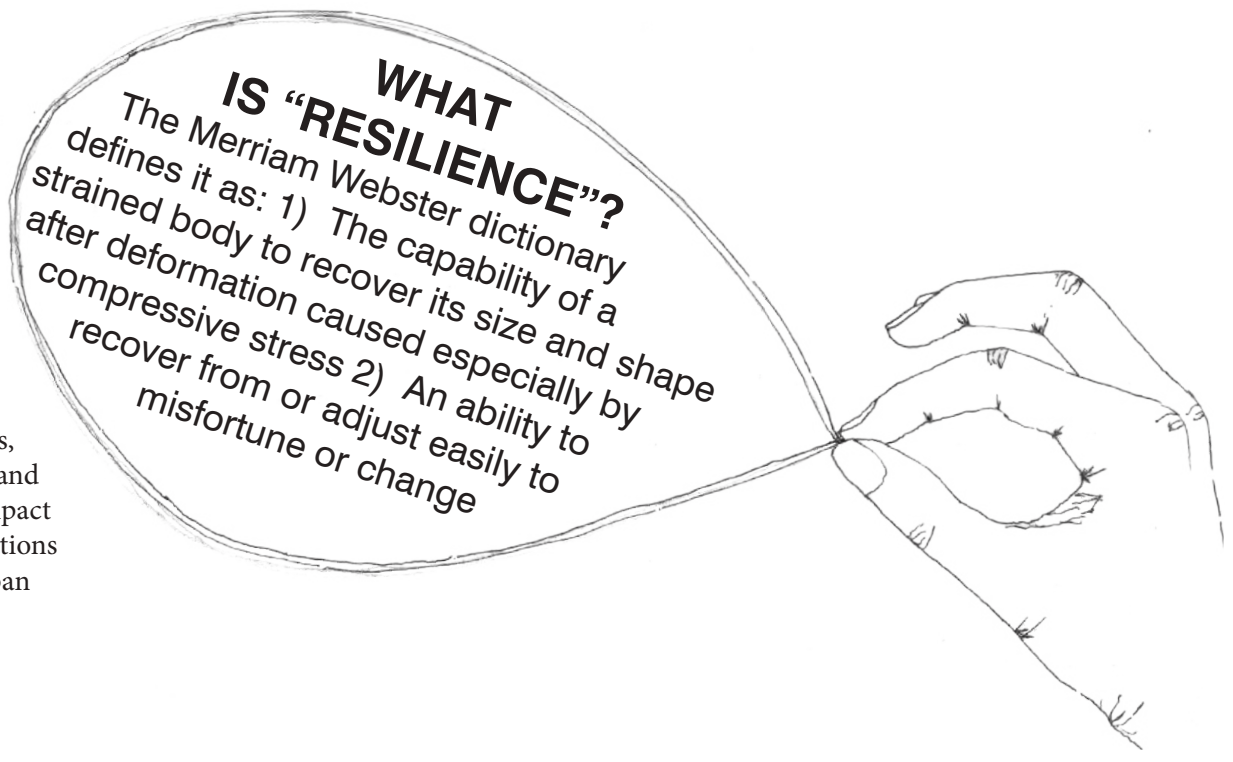
Seaside Park Ball Fields, Summer 2016



Seaside Park's Mirror Lake, Summer 2016



Publicly-accessible marsh of Naval Cemetery Memorial Landscape (Image Source: Nelson Byrd)



ADAPTING STREETS

Where flooding affects use of roadways, raising the road surface and/or adding stormwater retention features can help maintain use, even during heavy rains. This is important for emergency access and for reducing damages and business interruptions during and after storms. Iranistan, located in a low-lying part of the South End, is an example of a street that regularly floods. The Resilient Bridgeport design team is working to reduce the impact of rainfall on streets like Iranistan, and is looking to the roadside bioswales of Paso Robles, CA, and elevated streets of Miami, FL, as precedents.



Bioswales on 21st Street, Paso Robles, CA (Image Source: SvR Design Company)



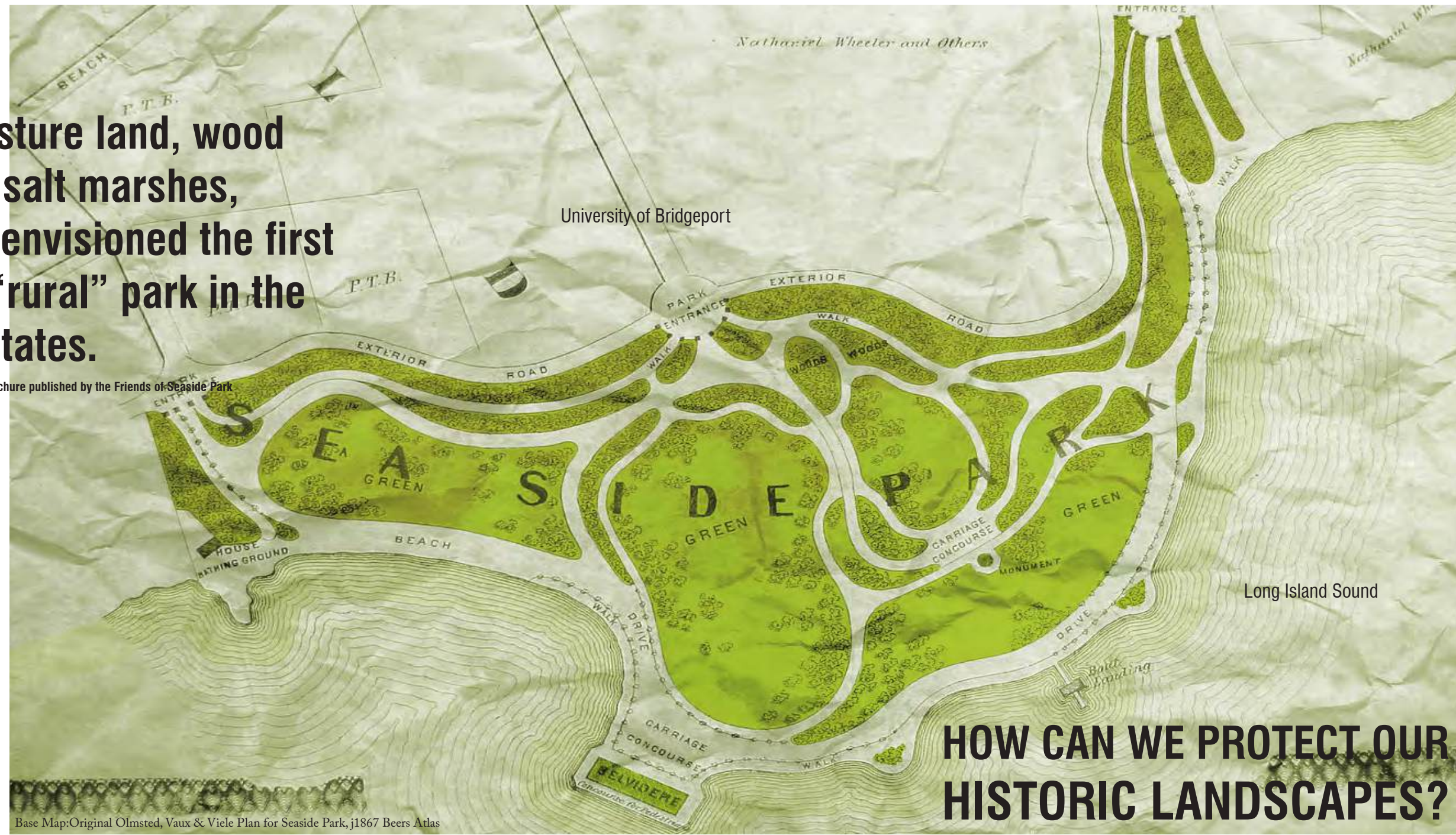
Flooding on Iranistan (Image Source: Diego Celis)



Raised Streets in Miami, FL (Image Source: Miami Herald)

Once pasture land, wood lots and salt marshes, Barnum envisioned the first marine "rural" park in the United States.

-From "Seaside Park," a brochure published by the Friends of Seaside Park



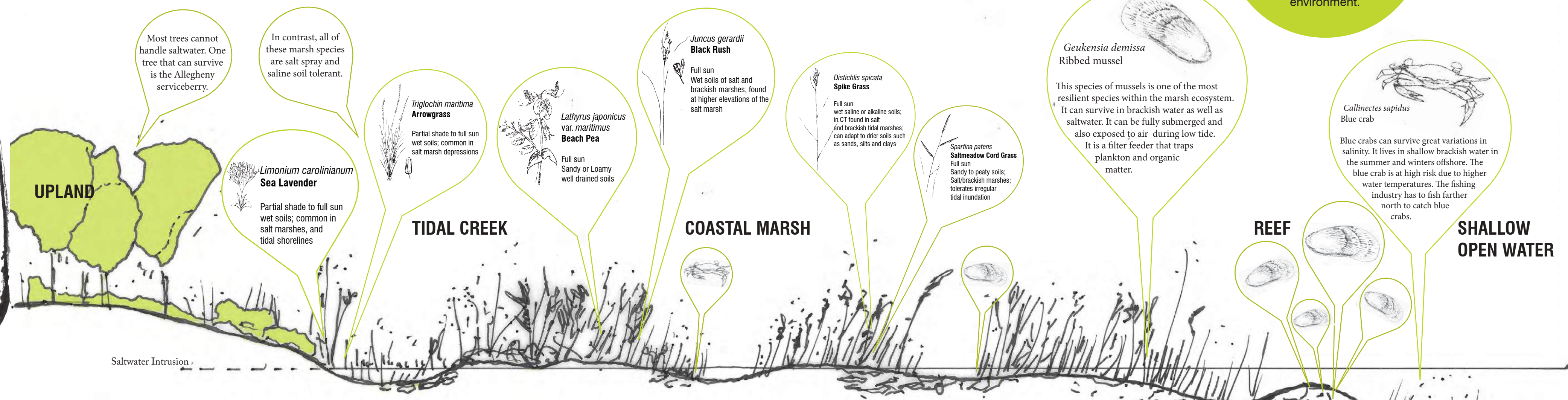
HOW CAN WE PROTECT OUR HISTORIC LANDSCAPES?

SEASIDE PARK

Seaside Park is one of Bridgeport's most important assets. Designed by renowned landscape architect Fredrick Law Olmsted in the late 1800's, the park has served generations of Bridgeport residents and visitors as a place for recreation, relaxation, and access to the Long Island Sound. To serve future generations, Seaside Park will need to be adapted to accommodate a changing climate and rising sea levels. Possible adaptations include planting strategies that can withstand periodic flooding and brackish water, as well as contouring the land to provide stormwater retention areas that can accommodate large volumes of rainfall without diminishing the use of the park during dry periods.

THE MARSH

Estuaries are where freshwater meets saltwater, such as at the mouth of a river. A coastal marsh is a specific kind of estuarine habitat. From hour to hour and day to day, the water level and the salinity of that water changes in relation to tides and currents. Submerged areas become exposed to air at low tides, while high tides reach inland and cover the landscape with saltwater. All species that thrive in coastal marshes are evolved to take advantage of these daily and seasonal cycles. Similarly, in the current era of climate change and sea level rise, human communities need to adapt to the changing environmental conditions.



CAN WE LEARN FROM ESTUARY SPECIES WHO RESIDE IN CONSTANTLY CHANGING CONDITIONS?

Spartina alterniflora
Smooth cordgrass is found in the intertidal zones of marshes, beaches, and shorelines. This grass holds soil in place and aids in maintaining shorelines. The ribbed mussel create a home within the root and stem structure of the cordgrass, and in turn provides nutrients to the grass. This grass also provides cover and food for birds such as the Canadian goose.

