WHERE DOES THE SEA BEGIN ?

A Regional Natural Park for Marennes-Oléron

Country / City	France / Versailles
University / School	Ecole Nationale Supérieure de Paysage - Versailles - Marseille
Academic year	2018/2019
Title of the project	Where does the sea begin ? A Regional Natural Park for Marennes-Oléron
Authors	Suzanne Katz

TECHNICAL DOSSIER

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Authors	Suzanne Katz
Title of the course	Master's Diploma Project
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Department/Section/Program of belonging	Project Design
University/School	Ecole Nationale Supérieure de Paysage - Versailles Marseille

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The project, **Where does the sea begin? A Regional Natural Park (PNR) for Marennes-Oléron,** combines local agricultural and aqua-cultural techniques with restoration ecology. Four separate interventions are designed to complement a new territorial strategy for the region's adaptation to simultaneously rising seas and an increasing population. Protecting the entirety of the coastlines of Charente and of the Island of Oléron against rising sea levels and coastal erosion is neither possible nor financially feasible. Significantly, according to the Conservatoire du Littoral, the **études et travaux du Plan Digues en Charente-Maritime** currently counts 137 dike maintenance and construction operations at an estimated cost of 250 million Euros between 2010 and 2023. In contrast, intertidal wetlands have been proven to be a superior tool for coastal resiliency. Cheaper to maintain than dikes and home to large populations of migratory birds and a diversity of both flora and fauna, intertidal wetlands actively protect coastlines from erosion, serve as a permeable barrier against sea surge and play a fundamental role in the global carbon cycle. They are also productive spaces, providing a rich and profitable food source. The creation of a Regional Natural Park of Marennes-Oléron would place these complex productive spaces at the heart of the region's evolution, reconnecting inhabitants and visitors with this difficult and enigmatic landscape.

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CLIMATE CHANGE AGAIN

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SCHOOL PRIZE

THE REGIONAL NATURAL PARK OF MARENNES OLERON

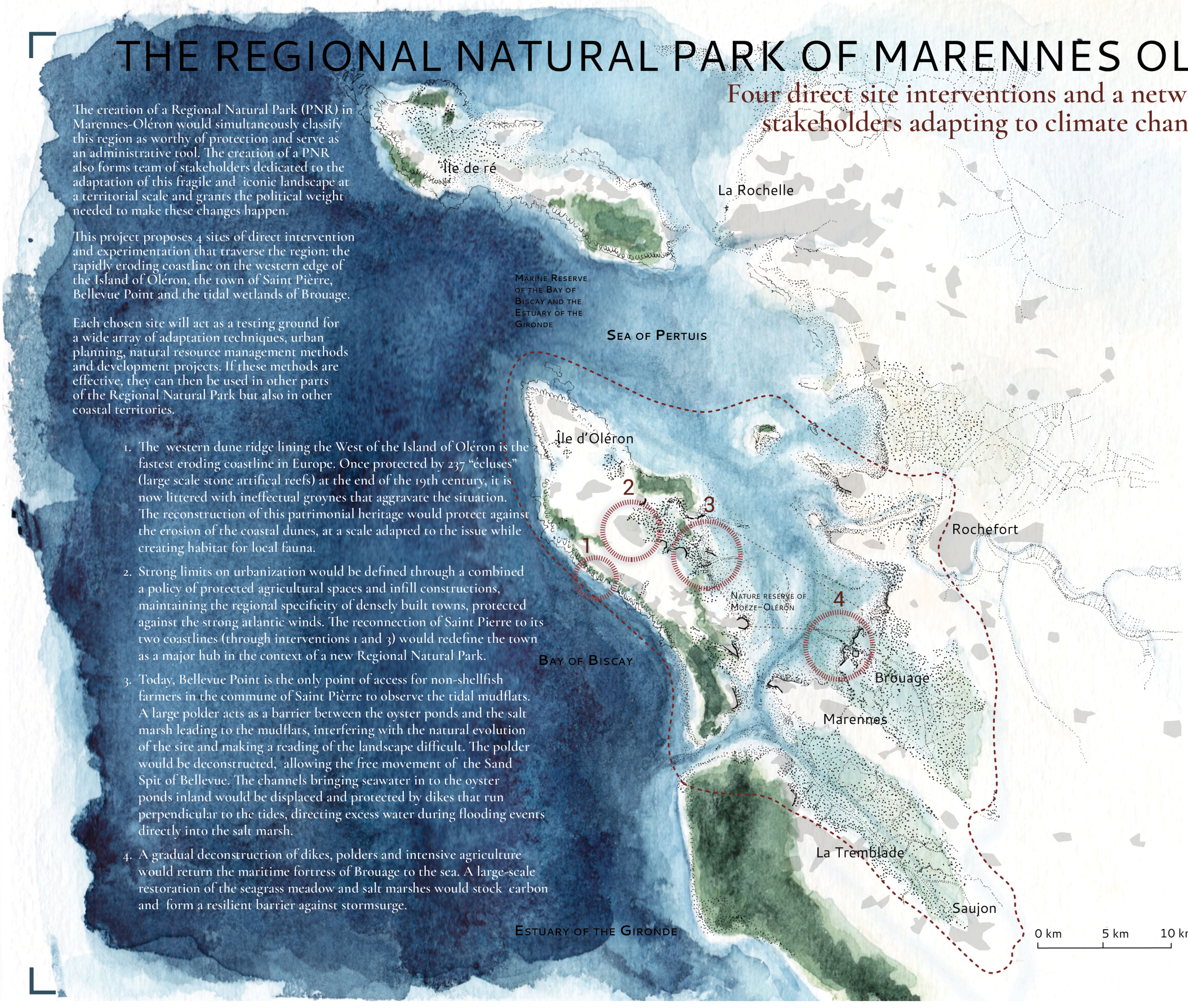
Four direct site interventions and a network of local stakeholders adapting to climate change together

The creation of a Regional Natural Park (PNR) in Marennes-Oléron would simultaneously classify this region as worthy of protection and serve as an administrative tool. The creation of a PNR also forms team of stakeholders dedicated to the adaptation of this fragile and iconic landscape at a territorial scale and grants the political weight needed to make these changes happen.

This project proposes 4 sites of direct intervention and experimentation that traverse the region: the rapidly eroding coastline on the western edge of the Island of Oléron, the town of Saint Pièrre, Bellevue Point and the tidal wetlands of Brouage.

Each chosen site will act as a testing ground for a wide array of adaptation techniques, urban planning, natural resource management methods and development projects. If these methods are effective, they can then be used in other parts of the Regional Natural Park but also in other coastal territories.

1. The western dune ridge lining the West of the Island of Oléron is the fastest eroding coastline in Europe. Once protected by 237 "écluses" (large scale stone artifical reefs) at the end of the 19th century, it is now littered with ineffectual groynes that aggravate the situation. The reconstruction of this patrimonial heritage would protect against the erosion of the coastal dunes, at a scale adapted to the issue while creating habitat for local fauna.
2. Strong limits on urbanization would be defined through a combined a policy of protected agricultural spaces and infill constructions, maintaining the regional specificity of densely built towns, protected against the strong atlantic winds. The reconnection of Saint Pierre to its two coastlines (through interventions 1 and 3) would redefine the town as a major hub in the context of a new Regional Natural Park.
3. Today, Bellevue Point is the only point of access for non-shellfish farmers in the commune of Saint Pièrre to observe the tidal mudflats. A large polder acts as a barrier between the oyster ponds and the salt marsh leading to the mudflats, interfering with the natural evolution of the site and making a reading of the landscape difficult. The polder would be deconstructed, allowing the free movement of the Sand Spit of Bellevue. The channels bringing seawater in to the oyster ponds inland would be displaced and protected by dikes that run perpendicular to the tides, directing excess water during flooding events directly into the salt marsh.
4. A gradual deconstruction of dikes, polders and intensive agriculture would return the maritime fortress of Brouage to the sea. A large-scale restoration of the seagrass meadow and salt marshes would stock carbon and form a resilient barrier against stormsurge.



KEY :

- limestone shoreline
- sandy shoreline
- tidal mudflats
- salt marsh progression to freshwater wetlands
- pine forests
- canals and streams
- rivers
- dikes
- *"écluses"*
- towns and villages

BROUAGE : A FORTRESS OF COASTAL WETLANDS

Gradual deconstruction of mid-20th century dikes and polders restores tidal wetlands and reunites the 17th century maritime fortress of Brouage with the Sea of Pertuis

SITE INTERVENTION # 4

The sea begins here, in these wetlands and so too does this project. By deconstructing the dikes and the intensive agricultural practices of the Wetlands of Brouage, the Fortress of Brouage would be reunited with her historic coastline.

Local shellfish farming techniques and salt meadow pastures would be restored. The sea meadow habitat in the now extended mudflats and salt marsh would work in partnership with the oyster beds, tide-filled oyster ponds and inland, diked oyster ponds.

All of these would contribute to an increased carbon storage capacity of the site, restored habitat biodiversity and diversified local economy intimately linked to the landscape. The resulting mosaic would act as a buffer against storm surge and provide greater resiliency to rising sea levels , all while re-centering the town of Brouage in its role as a maritime fortress.

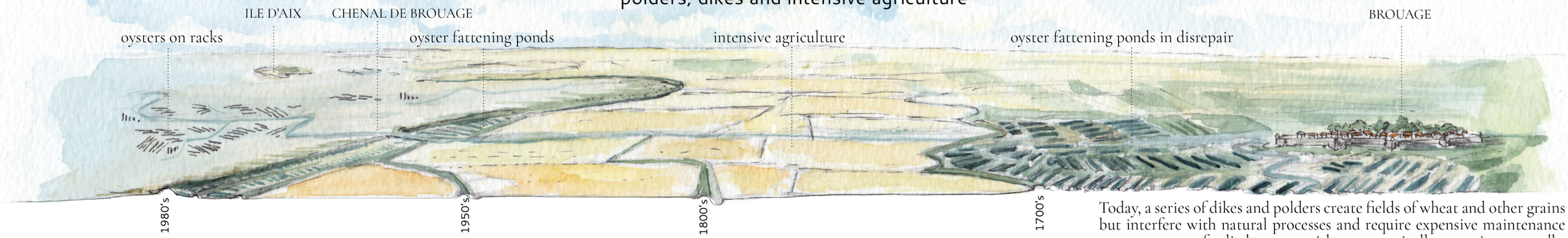
EXISTING SEA-DIKES

KEY :

- water line at low tide
- tidal mudflats
- canal
- salt marsh
- proposed dikes
- tidal oyster ponds
- low level diked oyster ponds
- fortifications
- buildings

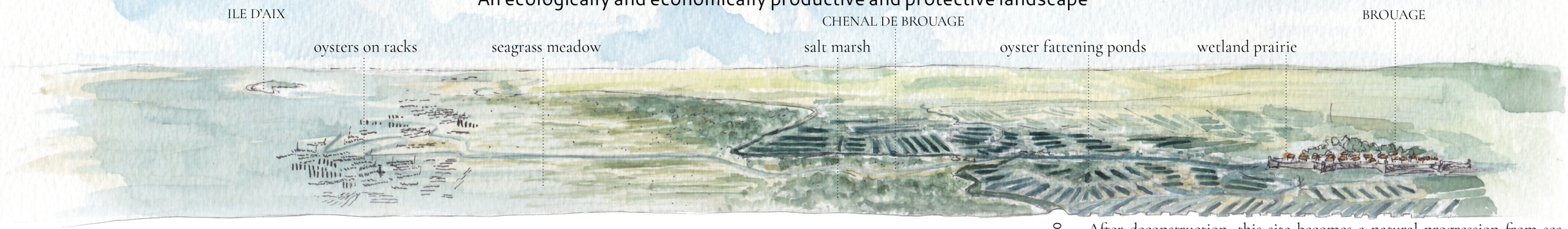
BROUAGE IN DETAIL :

CURRENT STATE OF THE SITE :
polders, dikes and intensive agriculture



Today, a series of dikes and polders create fields of wheat and other grains but interfere with natural processes and require expensive maintenance for little return, either economically or environmentally.

A PLANNED RETREAT :
An ecologically and economically productive and protective landscape



After deconstruction, this site becomes a natural progression from sea to land, in all its varying layers and depths. A resilient and productive mosaic of different habitats forms a diverse ecosystem.

Shellfish farming and wild oyster beds purify water

- Filters up to 180 liters of water per day per oyster.
-Employs thousands of people annually
-Oyster beds stabilise the sediments of the mudflats and form habitat for other species.

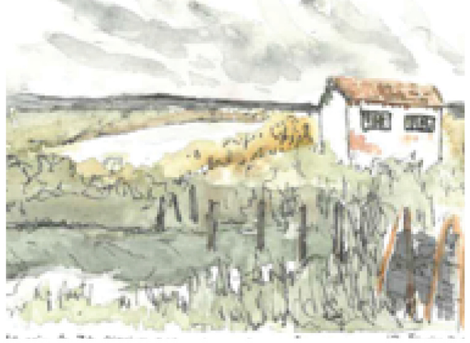
Seagrass meadow stores carbon and prevents erosion

-Dwarf Zostera habitat and creating a continuous sea grass meadow.
-protects the coastline against erosion and sea surge.
-creates nursery habitats
-attracts migrating birds

Salt marsh protects against storm surge

- The sea grass meadow progresses into a "pré-salé- or schorre ; the pré-salé is located on the upper part of the foreshore, submersible during high tides
-Low vegetation provides physical resistance to erosion.
-Forms a transition between the submerged areas at each tide and the terrestrial environment.

Oyster ponds and aquaculture maintain regional identity



- Low-level dikes define the oyster ponds and also serve as pathways, allowing visitors to immerse themselves in the landscape.
-As sea levels rise, oyster ponds and other forms of aquaculture or salt harvesting migrate inward to occupy previously abandoned ponds.

Conservation grazing prevents tree-invasion and preserves wetlands

-Conservation grazing in the wetlands prevents tree-invasion of the site.
- Coastal wetlands have been proven to sequester carbon long-term (up to 10x more carbon stored per unit area than terrestrial forests.