Using the Ecological Restoration of Dunes and Mangroves to Improve Coastal Community and Habitat Resilience in Loiza, Puerto Rico

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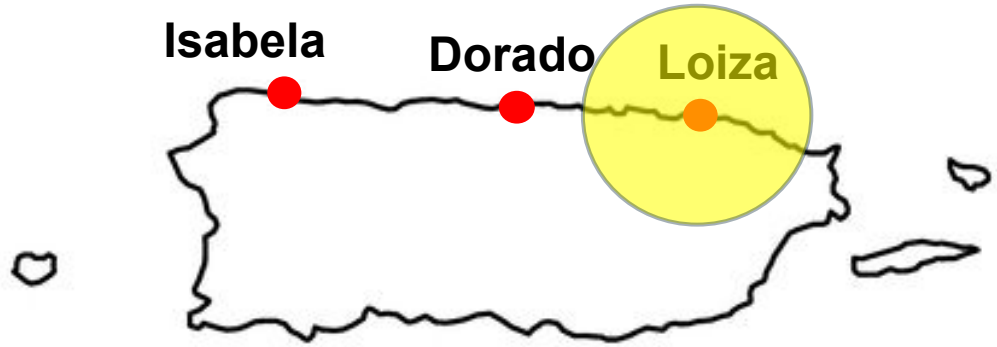
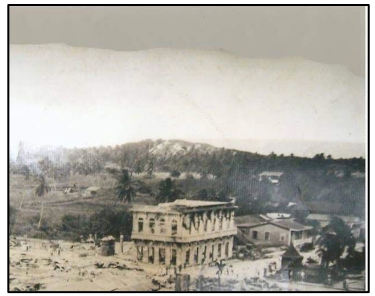
Dunes are commonly found on the north coast of Puerto Rico.

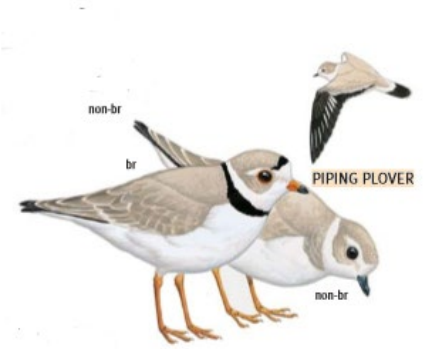




47.8% are found in Isabela, Dorado and Loiza.

Loiza

Sand dunes in Puerto Rico serve as habitat for important biota.



Dunes also play an important role in protecting lives and primary infrastructure from coastal hazards

Dunes in Puerto Rico have many threats and have been damaged, degraded and destroyed by human actions

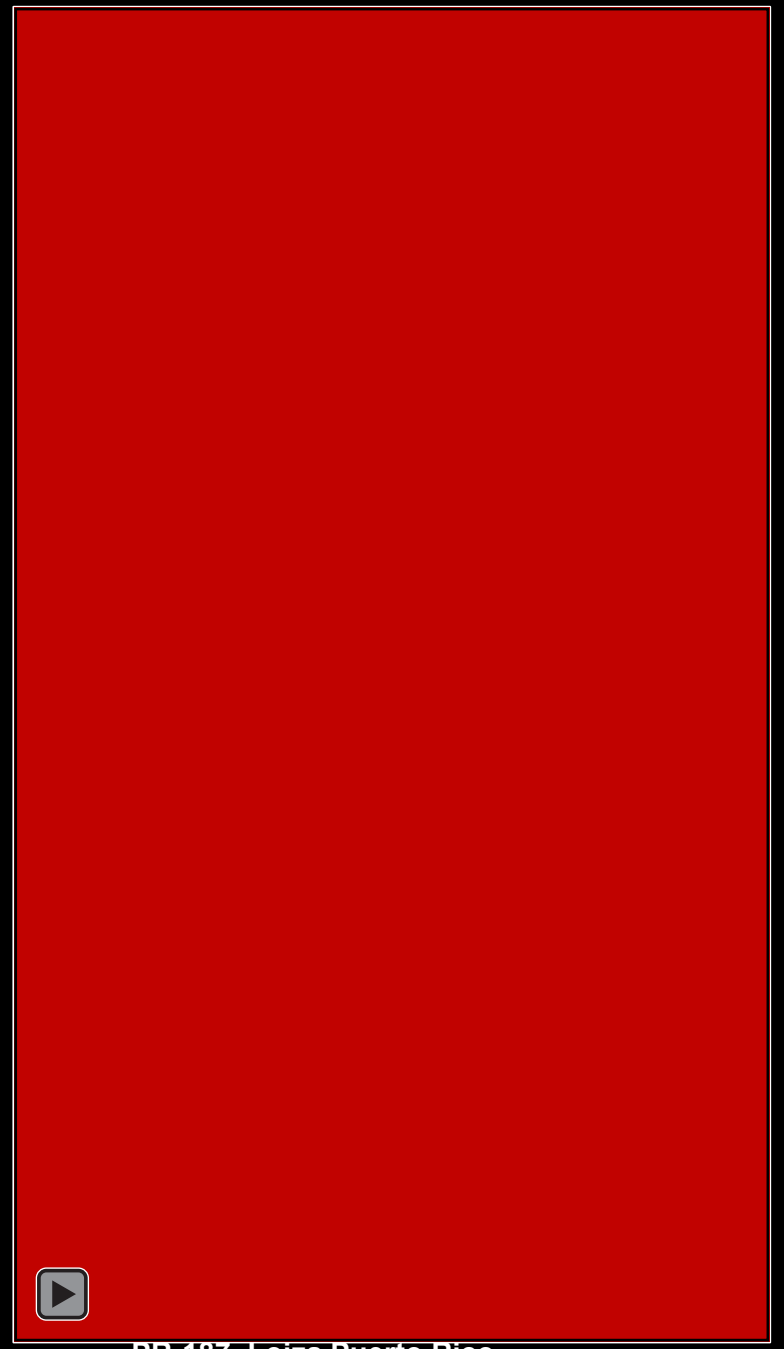
Random beach accesses, on coastal dunes, are a major threat to their integrity and cause problems.

Pedro Albizu Campos Road, Isabela, Puerto Rico

Middles beach, Isabela
After winter storm Riley – March 2018

Random beach accesses in Loiza cause a reduction in vegetation cover that makes dunes more vulnerable to erosion

Puts primary infrastructure, property and lives in danger in the event of strong wave action.



PR-187, Loiza Puerto Rico


clase
arepa con
bacalao
EL MOVIMIENTO
coco
frio

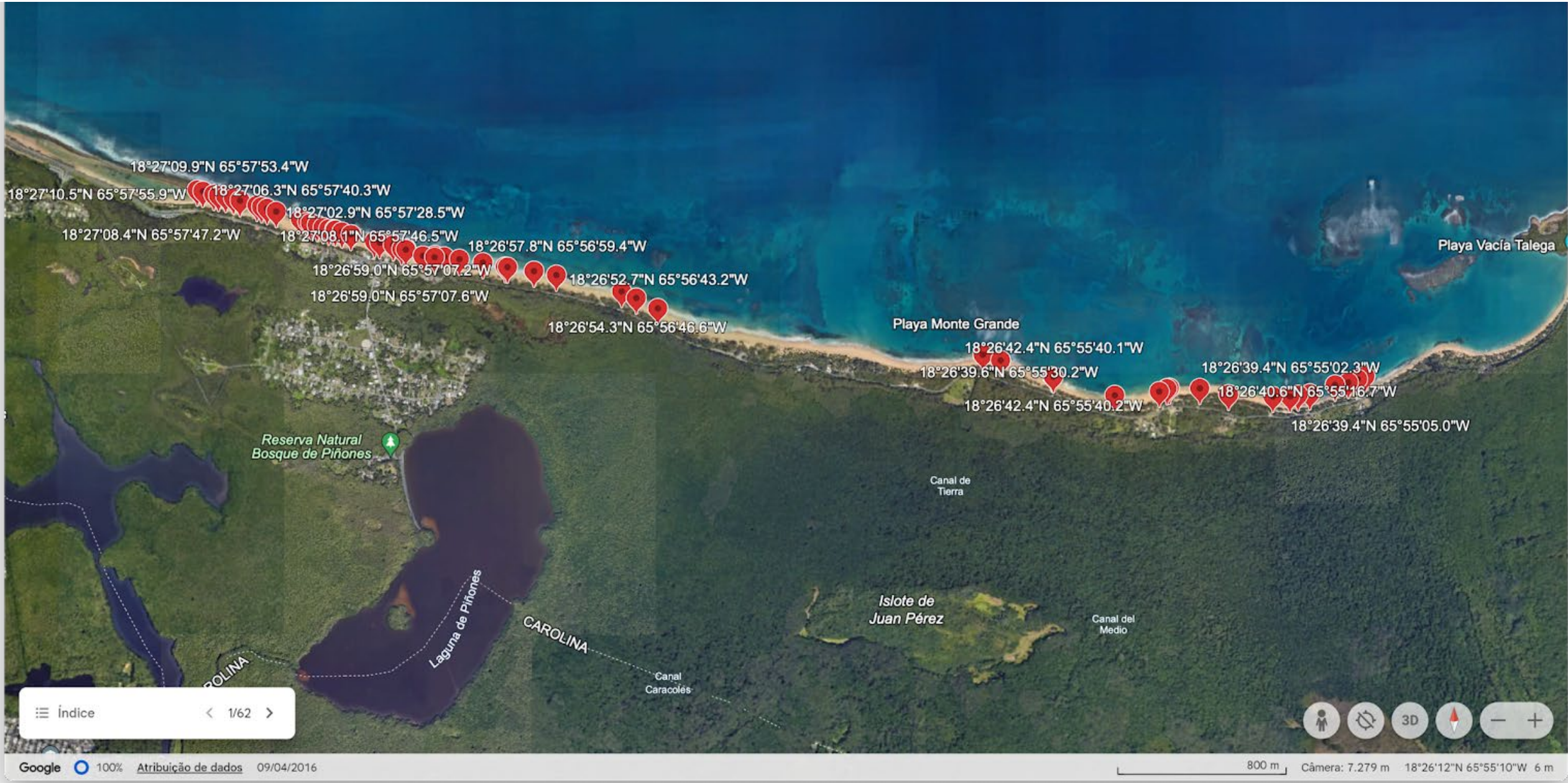

MAP
03/27/18
08:52.00
LOG
-04.1°
+00.5°
181° S01W 3218mils MAG
150
S
210
ZERO
A-B
CAL
LENS
2.0 X
S
There are no relocation programs for displaced sand in Puerto Rico

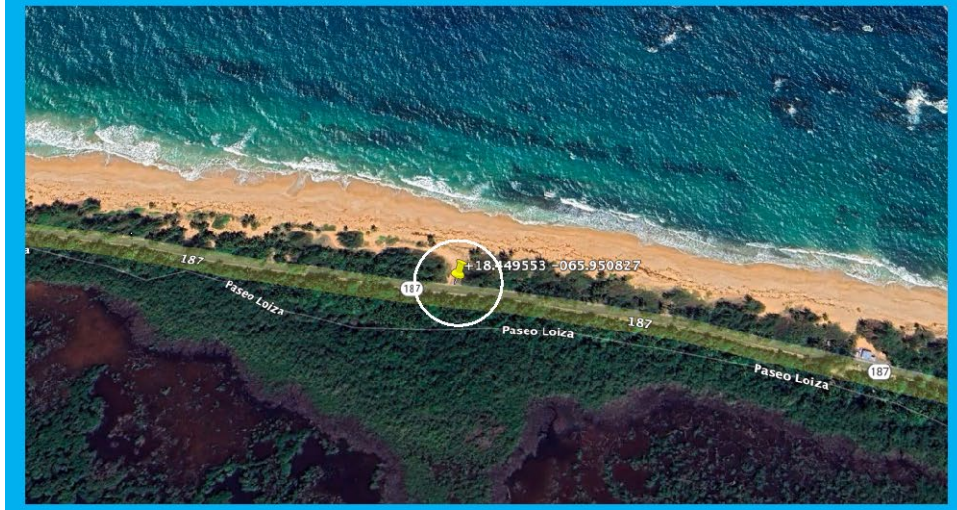

+018.458642° / -065.988388° ↑15m
MAIL
MAP
01/11/24
N
15:51:26
LOG
mils
120
100
80
60
40
20
06.5°
-02.6°
-05
00
SHOW EXTRAS...
186° S06W 3307mils MAG
PROCESSING 01
A-B
CAL
S
210
COLOR
1.0 X
S


UPR
AGUADILLA


PREFS
+018.427465° / -065.832612°
↑ 5m
MAP
03/05/24
N
11:42:29
LOG
-05
mils
240
200
160
120
80
40
00
-00.3°
+05
SHOW EXTRAS...
341° N19W 6062mils MAG
ZERO
A-B
CAL
330
N
COLOR
0.5 X


+018.431112° / -065.835604° ↑1m
MAIL
MAP
12/08/23
N
10:51:40
LOG
2x
4
8
16
CAL
-01.4°
-05
00
7°
SHOW EXTRAS...
051° N51E 0907mils MAG
A-B
CAL
030
060
COLOR
1.0X
S


18°27'09.9"N 65°57'53.4"W
18°27'10.5"N 65°57'55.9"W
18°27'06.3"N 65°57'40.3"W
18°27'02.9"N 65°57'28.5"W
18°27'08.4"N 65°57'47.2"W
18°27'08.1"N 65°57'46.5"W
18°26'57.8"N 65°56'59.4"W
18°26'59.0"N 65°57'07.2"W
18°26'52.7"N 65°56'43.2"W
18°26'59.0"N 65°57'07.6"W
18°26'54.3"N 65°56'46.6"W
Playa Vacía Talega
Playa Monte Grande
18°26'42.4"N 65°55'40.1"W
18°26'39.6"N 65°55'30.2"W
18°26'39.4"N 65°55'02.3"W
18°26'40.6"N 65°55'16.7"W
18°26'42.4"N 65°55'40.2"W
18°26'39.4"N 65°55'05.0"W
Reserva Natural Bosque de Piñones
Canal de Tierra
Islote de Juan Pérez
Canal del Medio
Laguna de Piñones
CAROLINA
Canal Caracoles
Índice
1/62
3D
Google
100%
Atribuição de dados
09/04/2016
800 m
Câmera: 7.279 m
18°26'12"N 65°55'10"W 6 m



Installation of wooden fence.

Application of limestone rock material and biomimicry.

Planting stabilizing vegetation.

Installation of information signs about the project.

(+018.449553º -065.950827º).

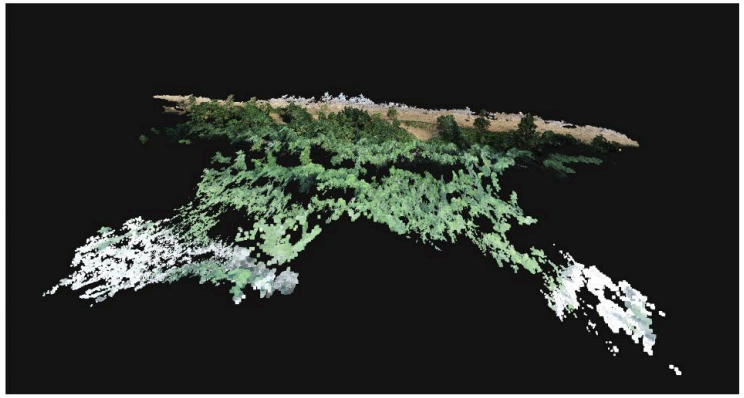
Sea turtle nesting in Loiza for 2024

100 ft long boardwalk A
60 ft long boardwalk B
300 ft long fence a
24 ft long fence b
61 ft long fence c
142 ft long fence d
Signs (red dots)
Biomimicry (brown shaded areas)
Planting (green shaded areas)

Playa Tocones, Loiza. Capture of imagery by drone to study the area to be executed or work and installation of boardwalk. Marzch 06, 2024.

Using PIX4D to analyze aerial imagery and metrics

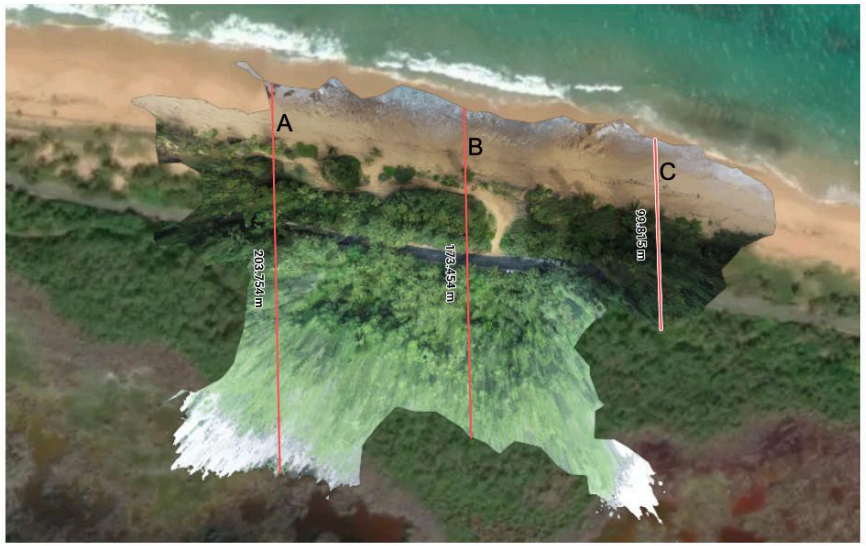
3D map
Playa Los Marullos, Loiza

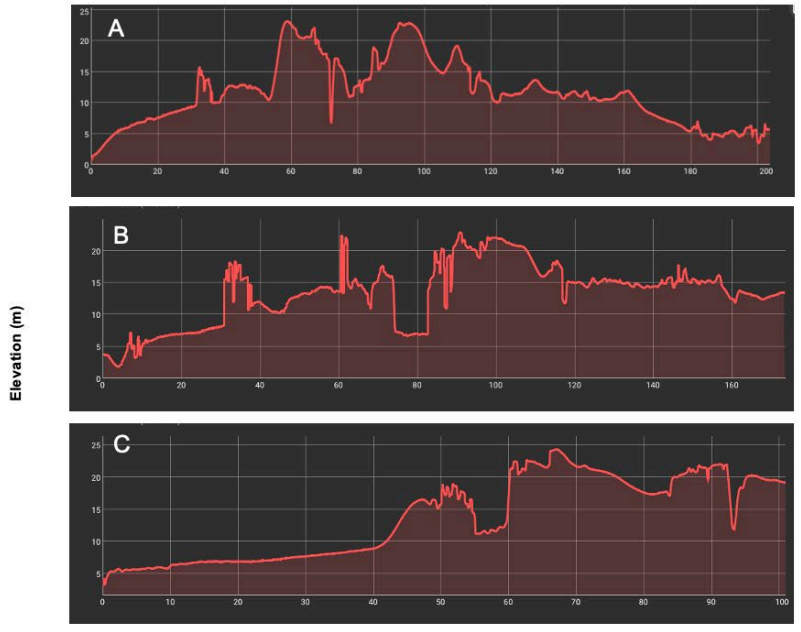


2D map

Total area of site = 4.82375 ha

Site elevation (m)
Playa Los Marullos, Loiza





Metrics

Shoreline position

Beach width

Elevation

Volume

Shore face

Backshore

Dune width

Dune height

Dune volume

Sand grain size

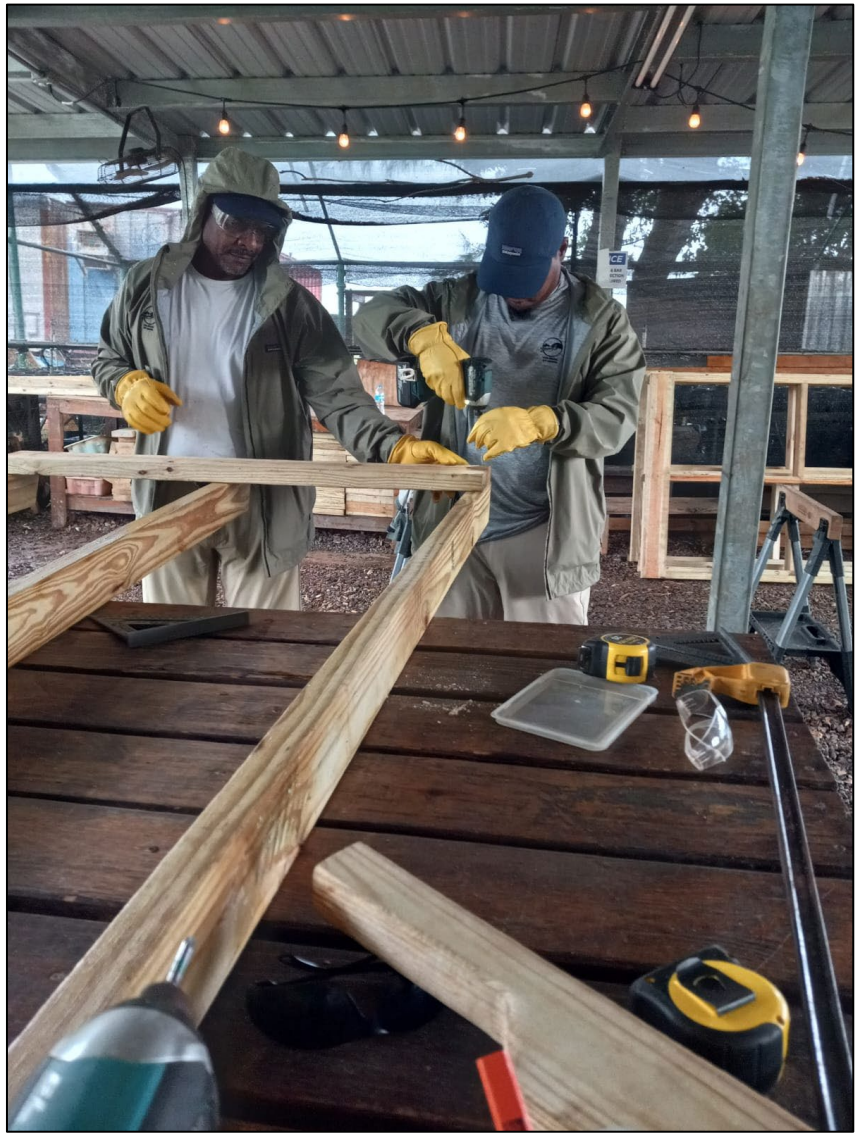

AUTOS VEGA


patagonia
HERRERA


Belleza y Fuerza
HERRERA


Belleza y Fuerza
HERRERA

Theoretical training for new Vida Marina employees who work in Loiza. Course held at the Vida Marina workshop, UPR-Aguadilla by researchers Dr. Bárbara Antunes and Dr. Robert J. Mayer. February, 06, 2024.



Practical training for new Vida Marina employees who work in Loiza. Course held at the Vida Marina workshop, UPR-Aguadilla by the Vida Marina team. February, 07 and 08, 2024

Practical training for new Vida Marina employees who work in Loiza. Course held at the Vida Marina workshop, UPR-Aguadilla by the Vida Marina team. February, 07 and 08, 2024.

Interview with Loiza resident employees by the UPR press officer.

Labeling of the F150 single cabin vehicle purchased with NOAA funds for the project in Loiza, February, 11, 2024.

Labeling and internal preparation of the trailer acquired with NOAA resources for the project in Loiza

First day of organizing the space for construction of the carpentry workshop for the Project in Loiza, February 14, 2024.


Piñones National State Forest, Loiza. Our Loiza staff building workbenches. Marzch, 2024.

Piñones National State Forest, Loiza. Piñones National State Forest, Loiza. Construction of a carpentry house from the Loiza project -NOAA. Marzch, 2024.

Piñones National State Forest, Loiza. Piñones National State Forest, Loiza. Construction of a carpentry house from the Loiza project - NOAA. April 01, 2024.




Piñones National State Forest, Loiza. Piñones National State Forest, Loiza. Construction of a carpentry house from the Loiza project -NOAA. April 02, 2024.

Supervision visits of the work carried out in Loiza and planning of the next trips in wood by researchers Dr. Bárbara Antunes and Dr. Robert J. Mayer.







Playa Tocones, Loiza. Capture of images by drone to study the area to be executed or work and installation of boardwalk. Marzch 06, 2024.



Playa Tocones, Loiza. Installation of 60 ft of exclusion fences. Marzch 08, 2024.



Playa Tocones, Loiza. Installation of 60 ft of exclusion fences. March 08, 2024.

Torecillas, Loiza. Planting vegetation (253 plants), February 16, 2024.


AMERICAN
HAWK

Marbela Casa de Playa, Isabela

Sand accretion, as a result of Hurricane Fiona, on biomimicry matrices on the north-western coast of Puerto Rico.

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Figure 1. Biomimicry matrix on a breach on the primary dune in Secret Spot Beach, Isabela. The image on the left was taken on February 25, 2021 and the one on the right was taken on September 28, 2022. Note the large volume of sand accumulated on the mimicry. This was caused by the storm surge caused by hurricane Fiona on September 18, 2022.

Biomimicry matrices are built using boards from dismantled wooden shipping pallets driven on holes made using a gas-operated auger. The boards are installed in areas where there is significant wind-transport of sand.


La salud
de un pueblo
comienza con
la salud de


SONY

NCRF *PRE-PROPOSAL* – Narrative

Creating a Site Assessment and Preliminary Design to Protect a Community and Habitats in Loiza (PR)

PART I – PROJECT OVERVIEW

Project Category: Site(s) Assessment and Preliminary Design

1. ***What is the coastal resilience challenge you are seeking to address through your project?***

During the last decade, Vida Marina (Center for Conservation and Ecological Restoration of the University of Puerto Rico) has implemented restoration projects on the west coast of Loiza, Puerto Rico but has not been able to restore the east coast that is characterized by a rapidly receding shoreline that is full of debris. Vida Marina knows this area well and has an extensive network of collaborators in the community but severe coastal erosion, the presence of collapsed concrete structures (mostly informal), and the amount of other debris, sometimes dumped as makeshift erosion mitigation measures on that coast, have made it difficult to implement the nature-based techniques that the organization has successfully implemented on other parts of the island. In this project, **Vida Marina seeks to create an interdisciplinary team that will perform a site assessment and create a preliminary design for the restoration of the east coast of Loiza** that will protect its vulnerable, marginalized, and underrepresented community, critical utilities, primary infrastructure and habitats from the impacts of natural coastal hazards. This project will also help prevent the displacement of the community from their homes. Most people in this area live at a very short and dangerous distance from the shoreline making them very vulnerable to coastal hazards.

The preliminary design that will result from this project will focus on the removal of coastal debris, the installation living breakwaters, living shorelines, wooden boardwalks and decks. The plan will also focus on reforestation of the coast, and the ecological restoration coastal dunes to enhance protection of the communities of the east coast of Loiza and its habitats to coastal hazards. These techniques will also help prevent having to take more drastic grey measures such as the use

project integrate with past and planned future resilience activities in the area?

ological restoration of primary dunes and mangroves on the west coast of Loiza and
se needs of this area. The organization has also contributed to building the
al expertise in ecological restoration through an environmental
isconsin-Madison Earth Partnership Program. Vida Marina
ration and Resilience Grants for Underserved
f the west coast of Loiza and is also
na has hired and trained three
This has helped the
lso involved


Crayola
Pip-Squeaks
Skinnies
Washable Markers


Crayola
MARKERS


CIERRO




Restauración ecológica para niños

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UPR
Universidad de Puerto Rico


Vida Marina
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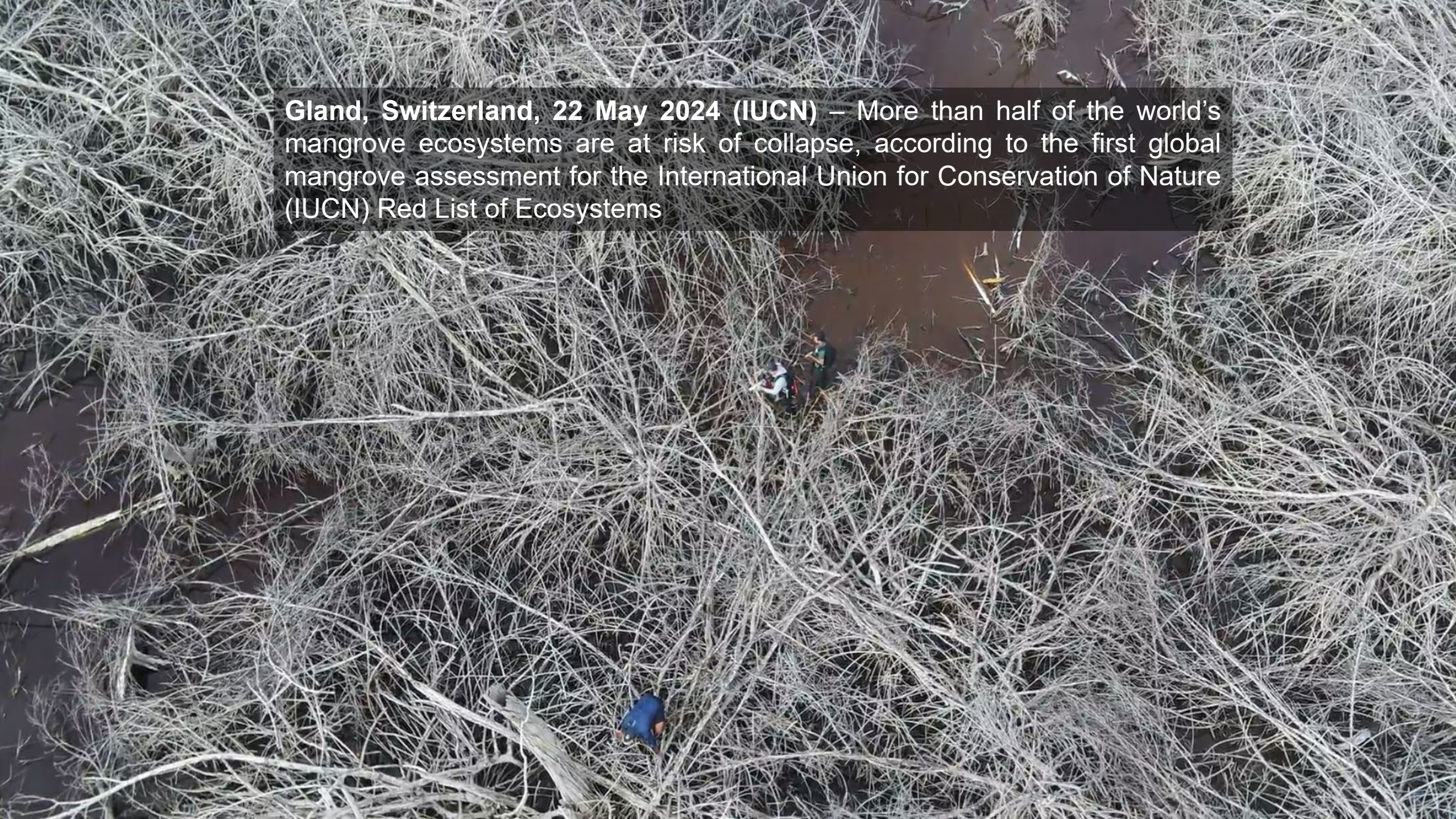

Gland, Switzerland, 22 May 2024 (IUCN) – More than half of the world's mangrove ecosystems are at risk of collapse, according to the first global mangrove assessment for the International Union for Conservation of Nature (IUCN) Red List of Ecosystems


FOOTBALL
TURKEY
NAP
EPEAT


COCO
CONSERVACIÓN
COSTERA
patagonia
SIEMBRA EN
MANGLAR
Debe utilizar zapatos cerrados, (no se puede usar chanclas)
ABRIL
13
8:00 AM
-
11:00 AM
FINCA NOLLA, CAMUY
conservacioncostera@gmail.com

FY22 Coastal Habitat Restoration and Resilience Grants

NFWF

National Fish and Wildflife Foundation
National Coastal Resilience Fund 2019