Farming of tropical seaweed in Puerto Rico

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The Nature Conservancy

THE UNIVERSITY OF CHICAGO
MARINE BIOLOGICAL LABORATORY

CARICOOS

Sea Grant
Puerto Rico

Marine Sciences, UPRM

Seaweed cultivation and opportunities

Eucheuma isiforme
(red seaweed native to the Caribbean)

Small-scale cultivation in Belize

Cultivation of closely related species in Tanzania

Applications

- Nutraceuticals/ Cosmetics
- Fresh food
- Processed foods
- Livestock feeds
- Fertilizers/ Soil conditioner
- Biofuels

Ecosystem Services

- Nutrient remediation
- Habitat provision
- Carbon uptake
- Wave dampening

Project Team

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non-profit research and education since 1979
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Hoyoung Kwon
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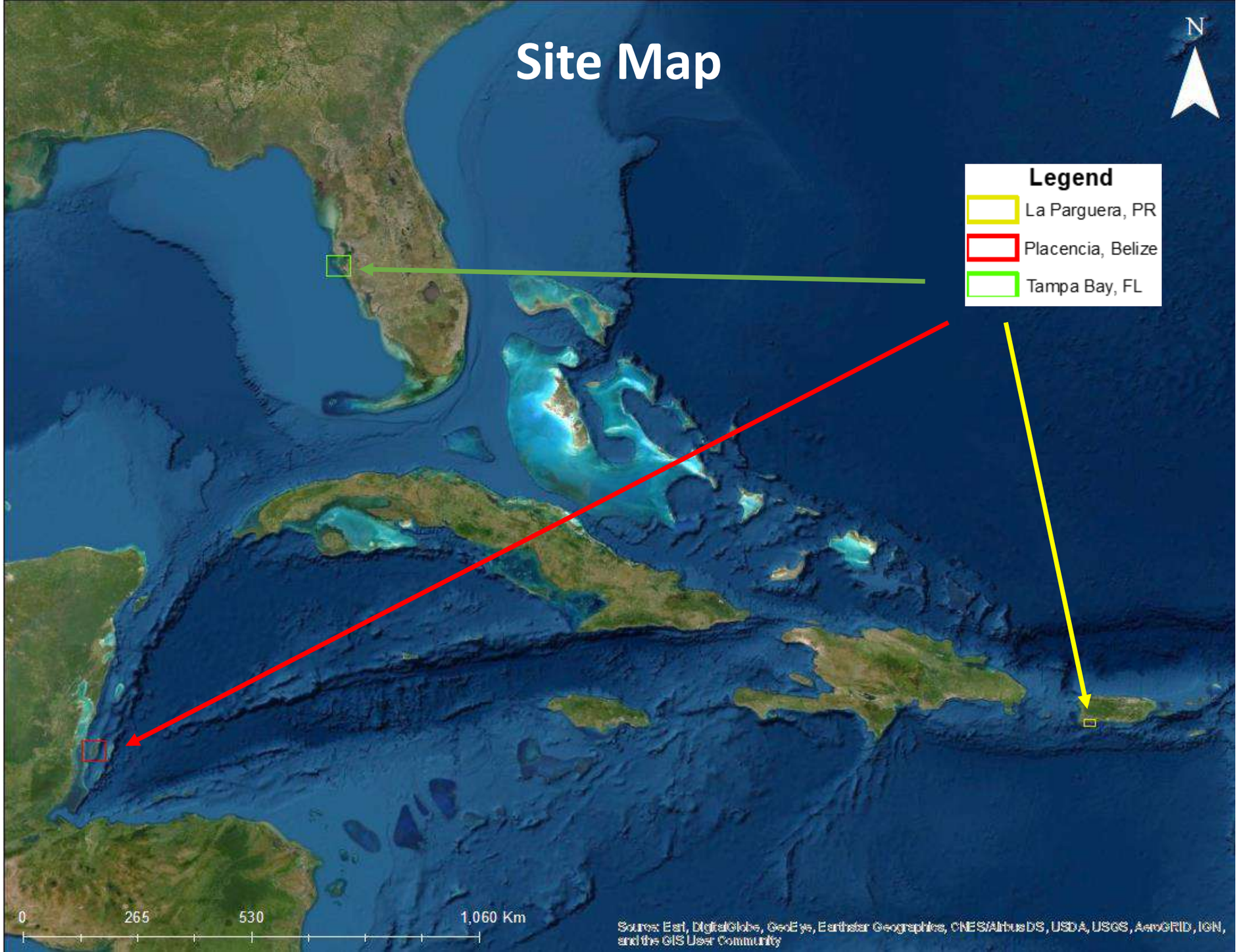
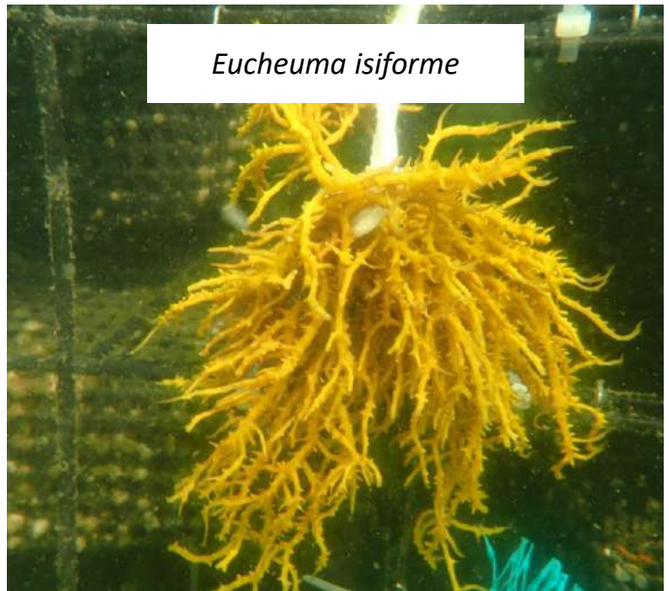
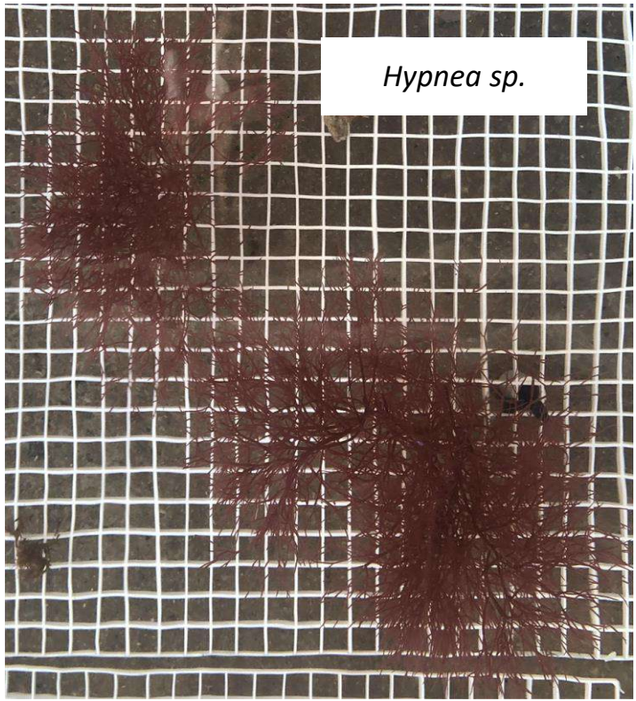
* **ANCIENT MARINER** (**A**laska, **N**ortheast, **C**aribbean **I**nitiative for **EN**ergy **T**echnology **Ma**croalgae **R**esearch **I**nspiring **N**ovel **E**nergy **R**esources)

Site Map

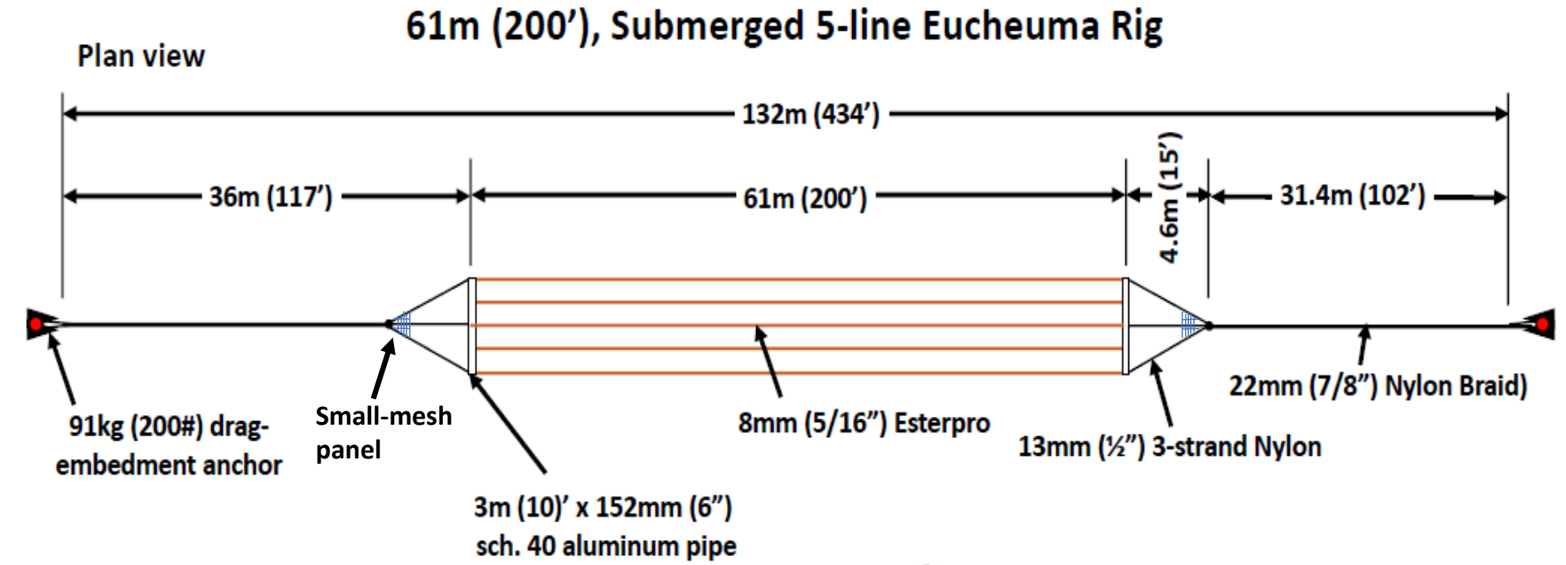

N
Legend
La Parguera, PR
Placencia, Belize
Tampa Bay, FL
0
265
530
1,060 Km
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

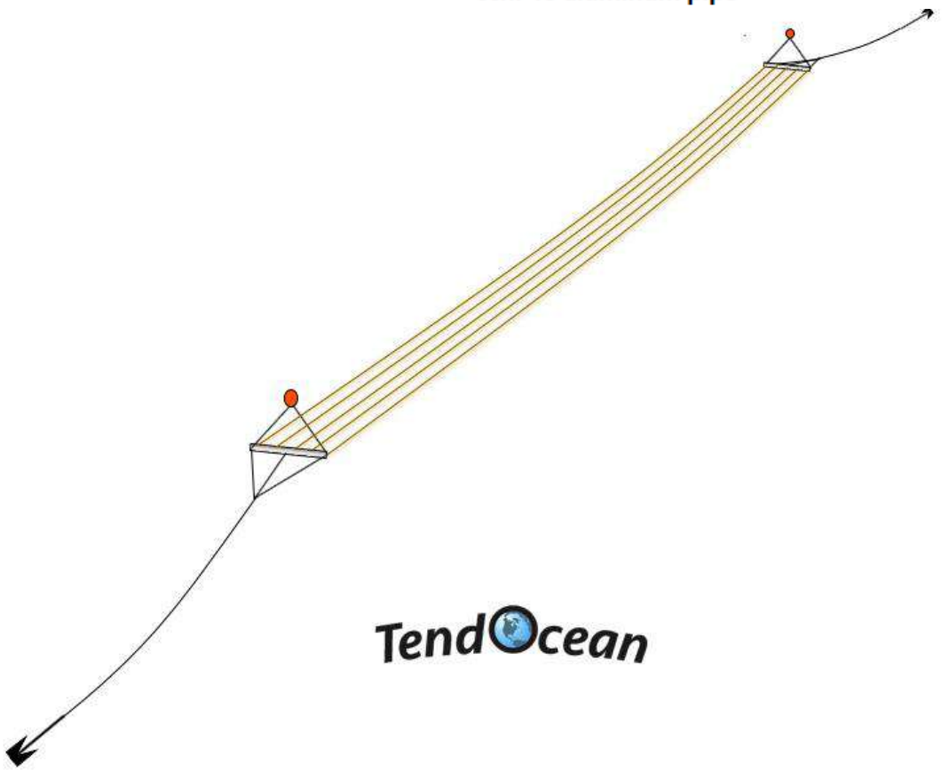
Samples of species we are testing in Puerto Rico





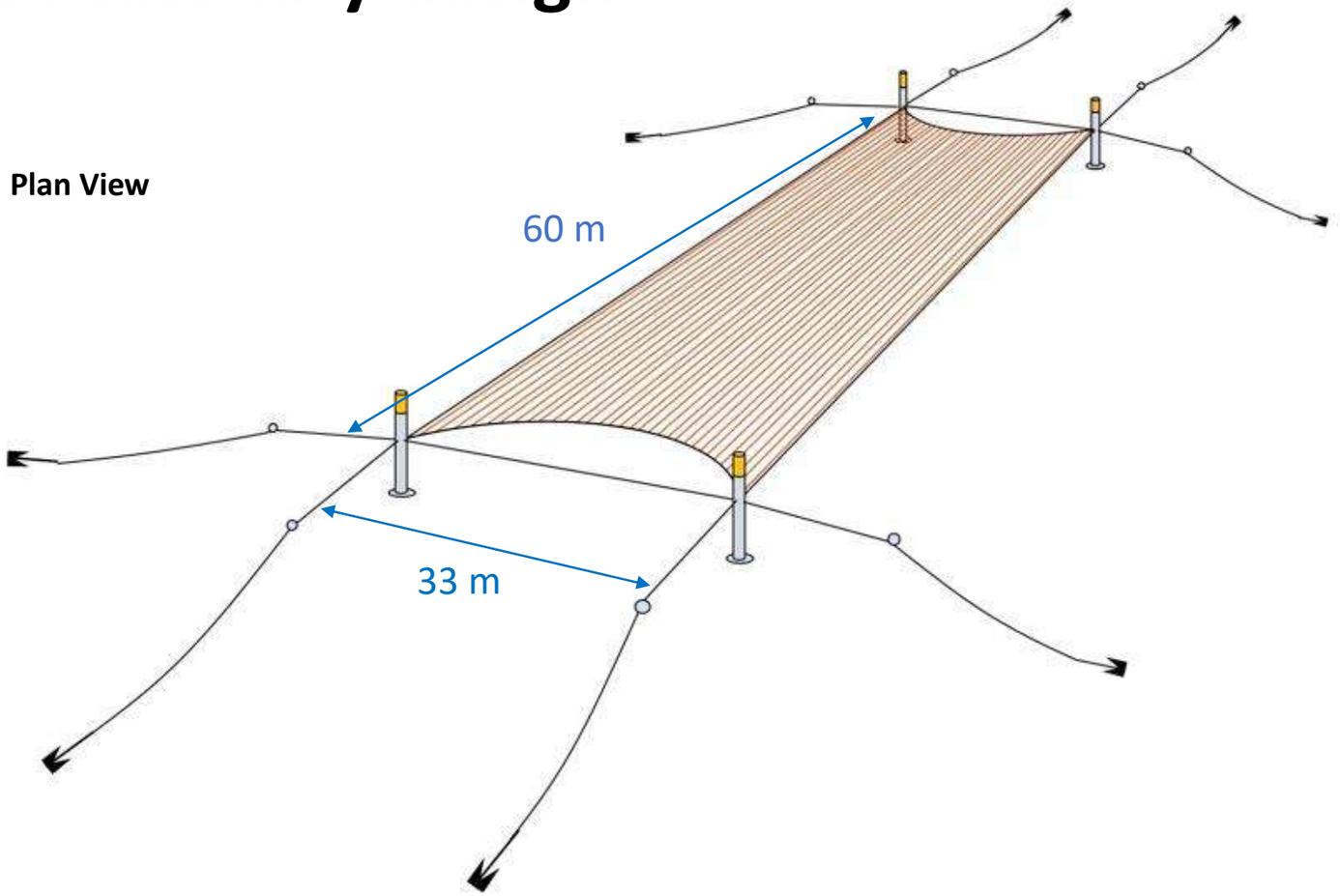
Mini farm design



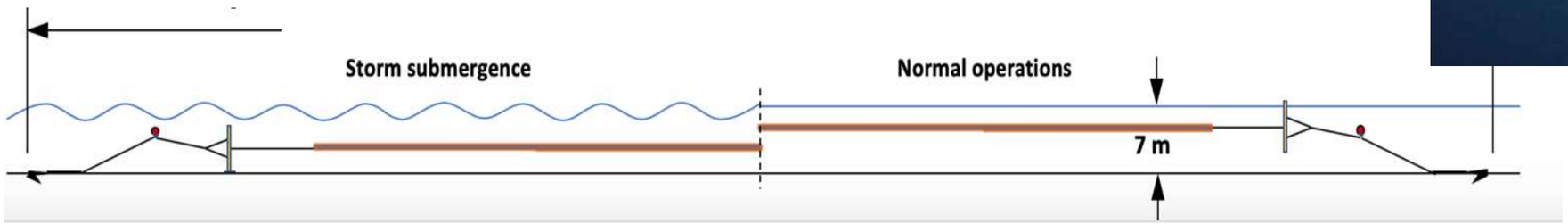


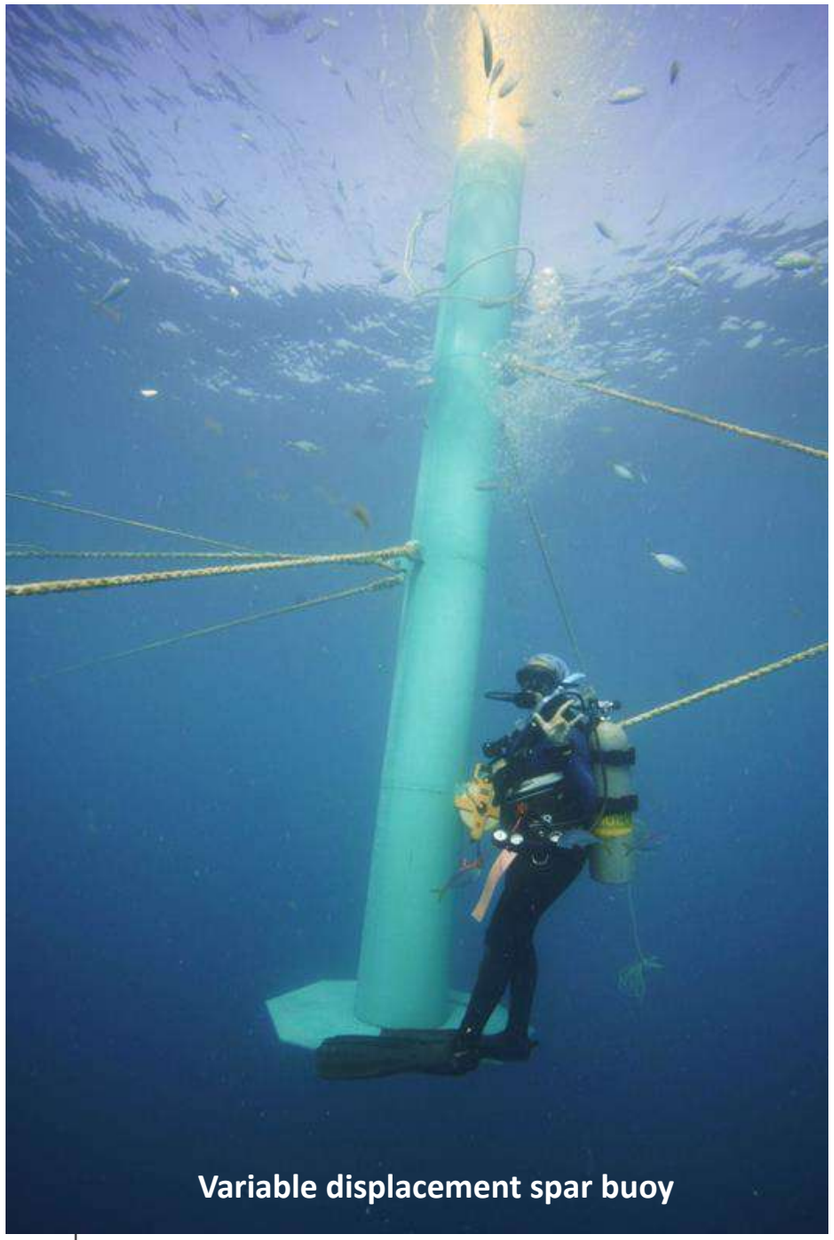
Pilot catenary design

Plan View



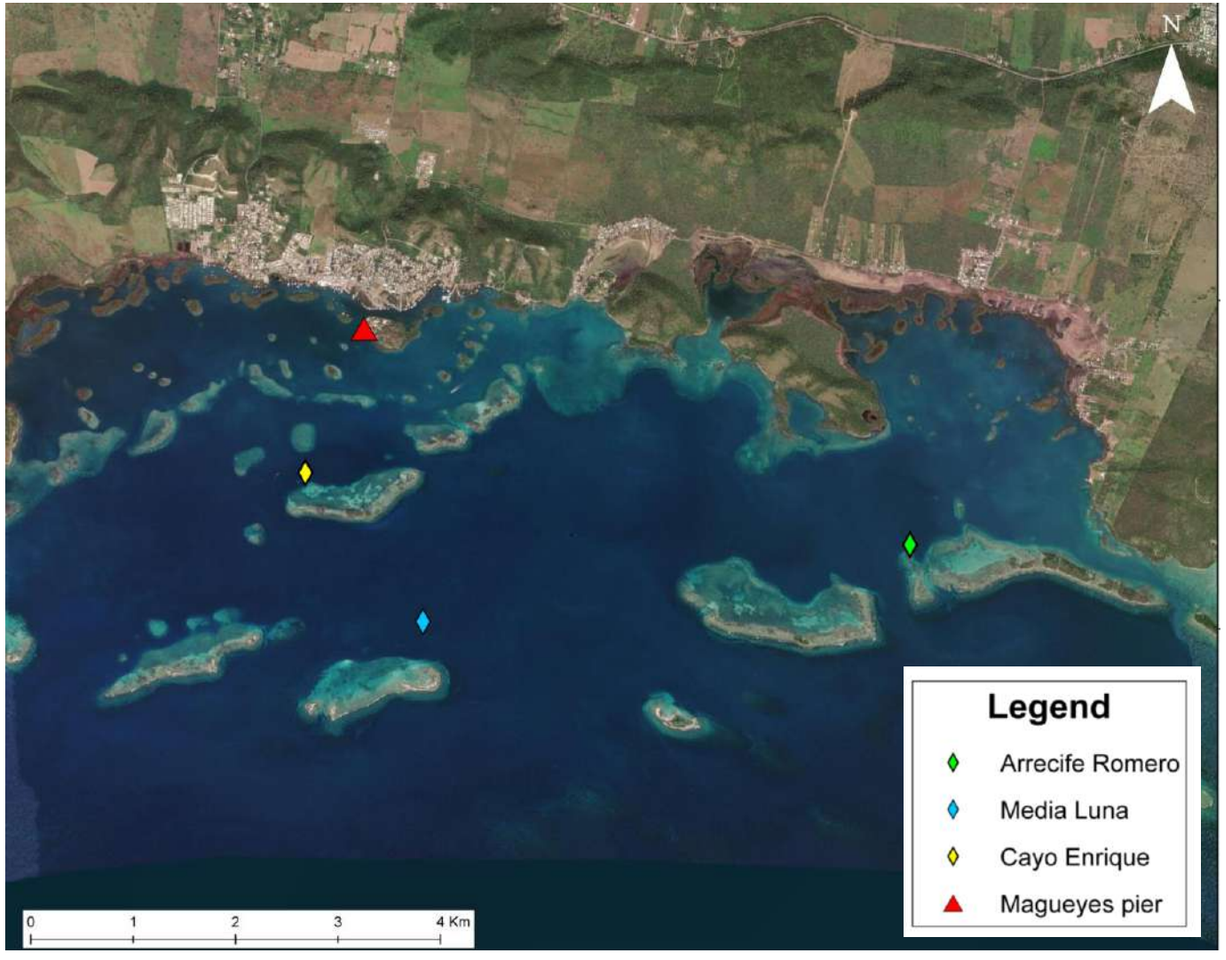
Side View





Variable displacement spar buoy

PR farm site in La Parguera



We need to understand the physical, chemical, biological, and ecological conditions at seaweed farms

Monitoring physical and ecological conditions

Acoustical instruments can measure waves, currents, and marine mammal visitations. Water sampling measures nutrients, temperature, salinity, etc.

Drone and autonomous vehicles testing and maneuvering

The Drone Tug is an autonomous vessel built for transporting harvested seaweed from offshore farms back to shore.

Drones with hyperspectral and regular camera imaging to characterize nutrients at the pilot sites.

Autonomous underwater and surface vehicles can monitor growth and use of the farm as habitat.

Developing cultivation systems and best management practices for Caribbean seaweeds in US waters

https://www.mbl.edu/tropical-seaweed

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Project goals

- Develop local markets for seaweed (e.g., food, feed, fertilizer, etc.)
- Local and large-scale, mechanized cultivation and harvesting of tropical marine macroalgae (seaweeds)
- Utilize species with rapid, vegetative (asexual) growth
- Assess environmental impacts and ecosystem services of seaweed farms
- Economic modeling and life cycle analysis of seaweed production

Initial questions

- Collaborators that you would recommend?
- Other groups we should engage?
- How do we find, involve, and support potential seaweed farmers?
- How can we best use our La Parguera site?

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