ORA TECHNOLOGIES

LET THE OYSTERS DO THE WORK: A PROPOSAL FOR CREATING TRULY BIOGENIC STRUCTURES FOR RESILIENCE AND RESTORATION

Tyler R. Ortego, Matthew Campbell, and Steven Hall

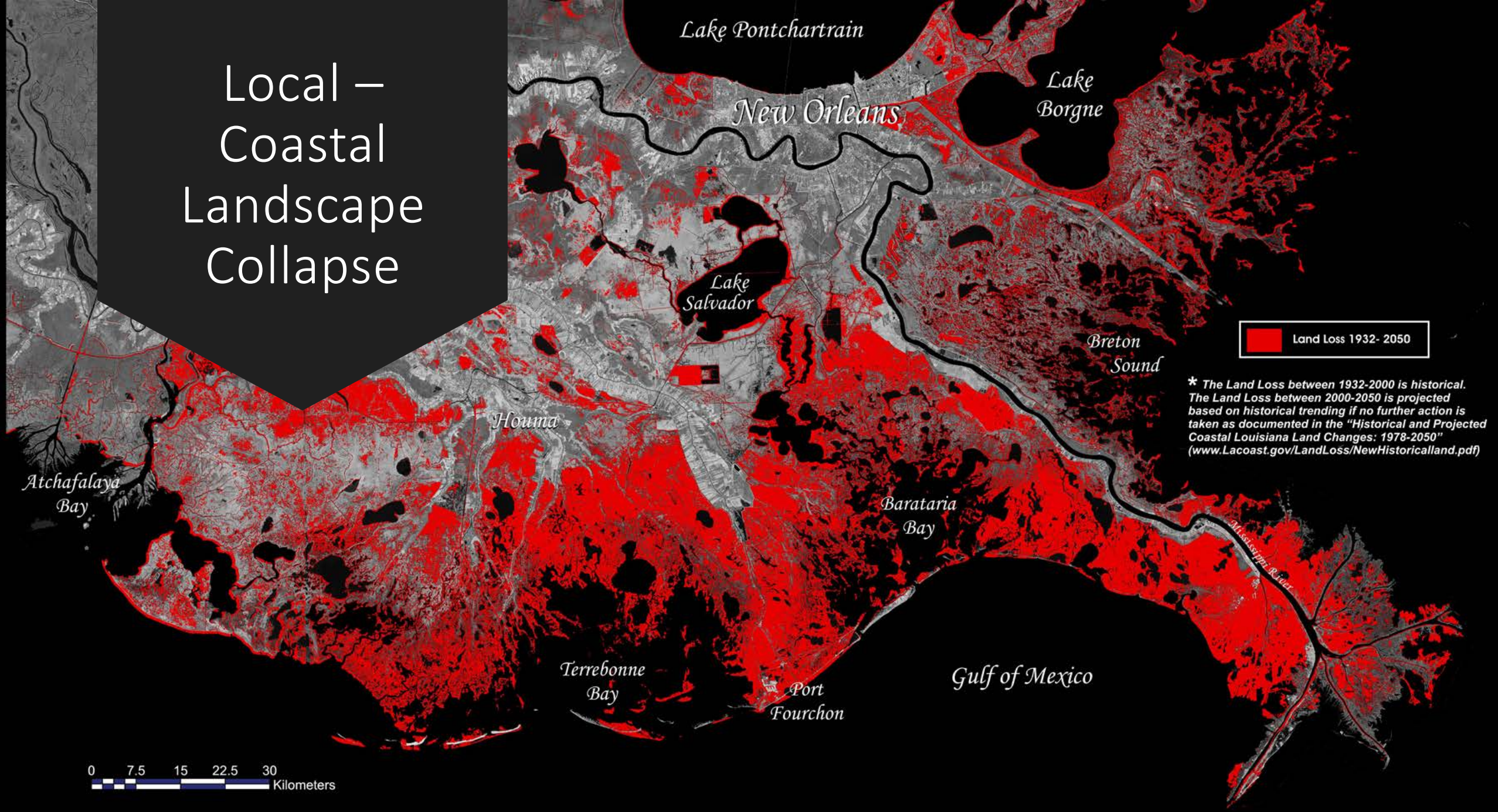
tyler@oratechnologies.com

Global - CLIMATE CHANGE & DEMOGRAPHICS

$28 trillion worth of coastal assets at risk.

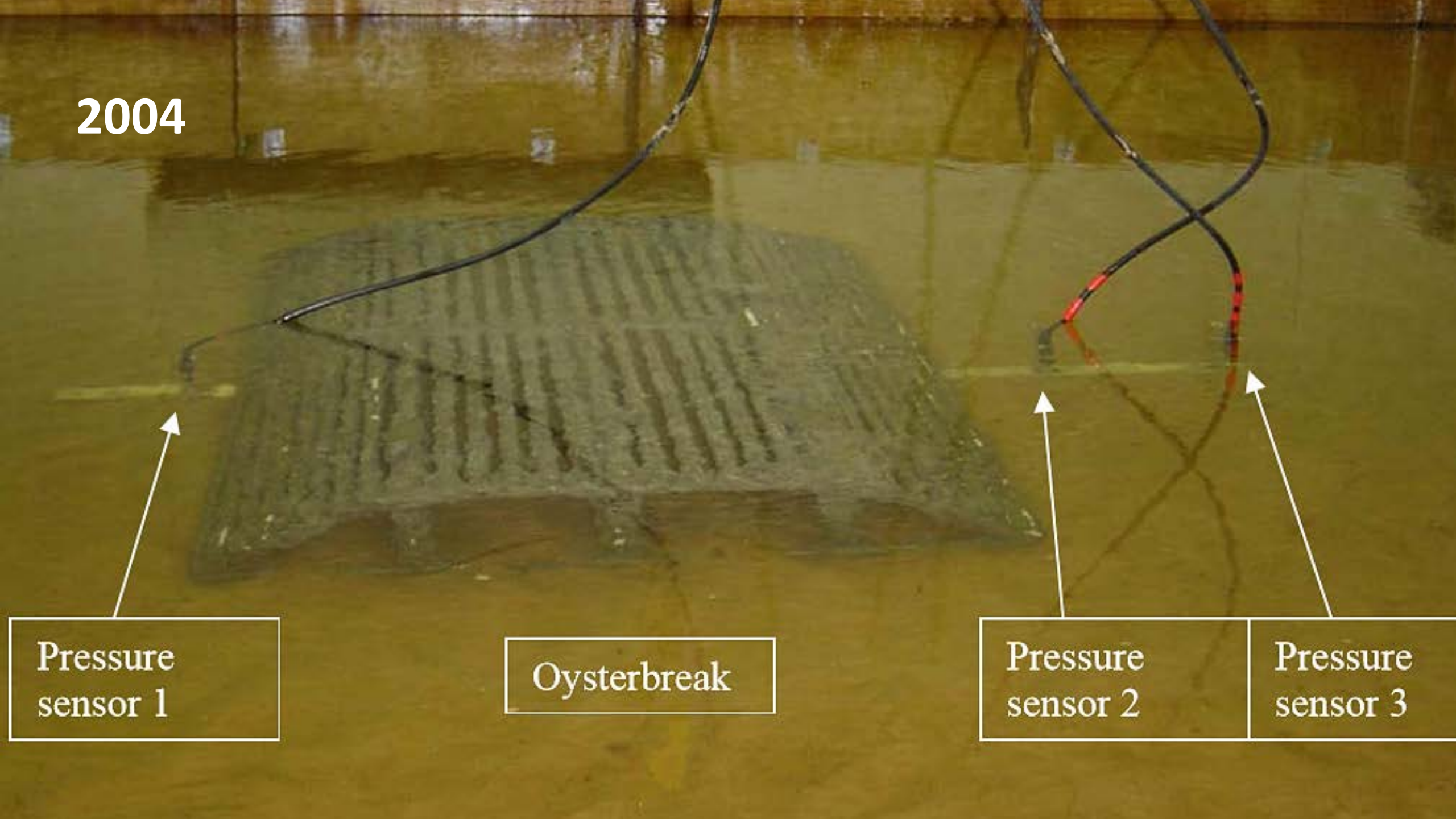
Over 1 billion people in low lying coastal areas by 2060.

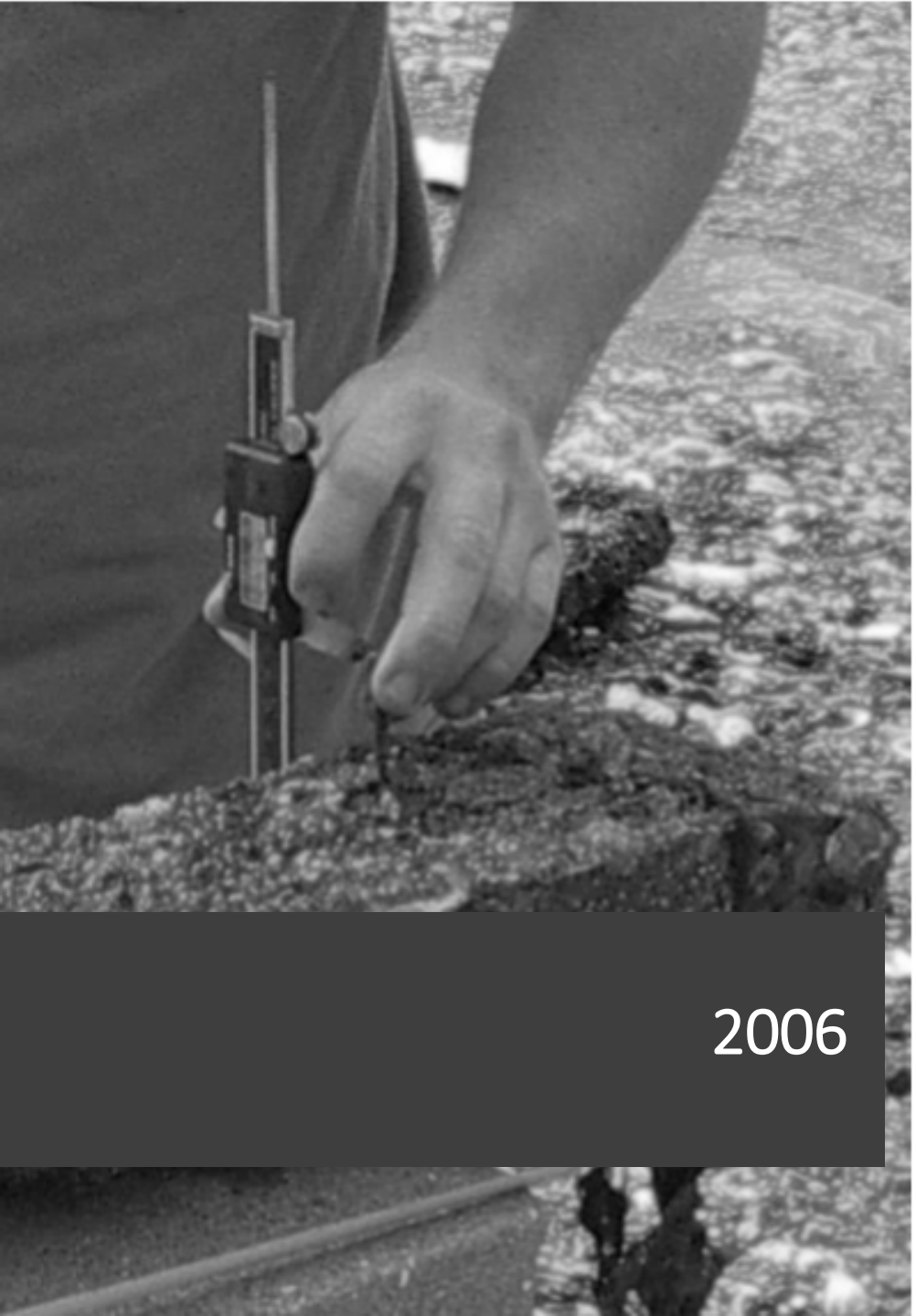
Local – Coastal Landscape Collapse



https://www.lacoast.gov/new/Pubs/Map_data/2050_25X25_FINAL_medium.jpg

Let the oysters do the work


2004
Pressure sensor 1
Oysterbreak
Pressure sensor 2
Pressure sensor 3



2006


06.04.



2010

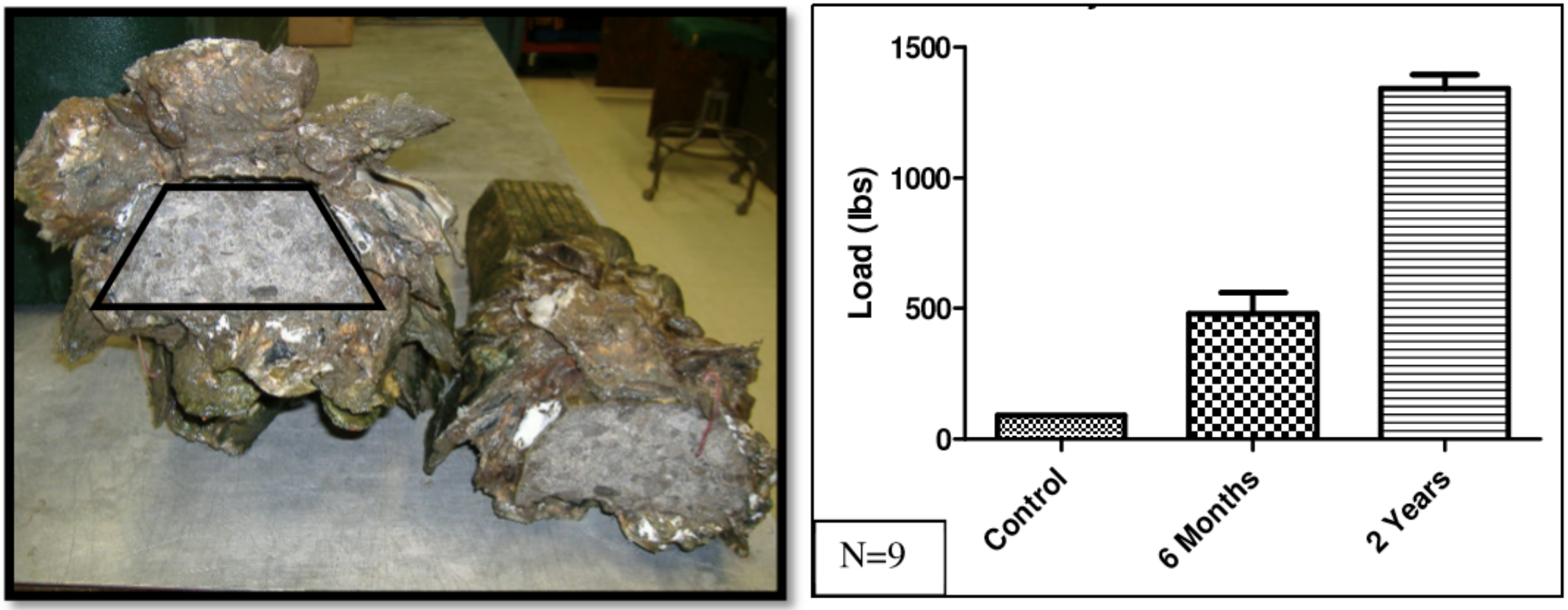
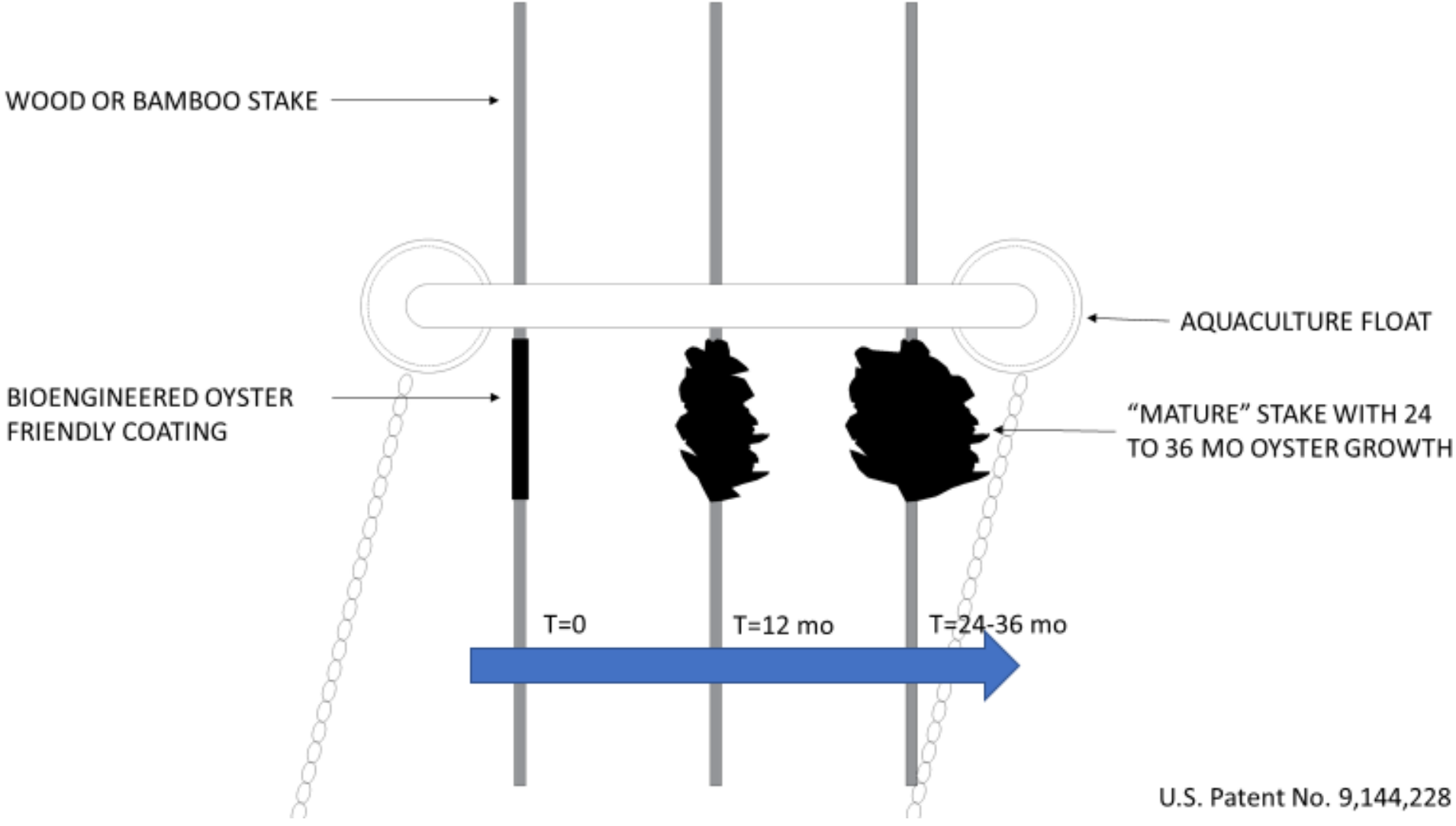


Figure 3.12 a, b: (a) Concrete with oyster growth (b) flexural strength variations over time.

Structural Stability

How low can we go?

How low can we go?



U.S. Patent No. 9,144,228

Oyster Scaffold Quantified Benefits

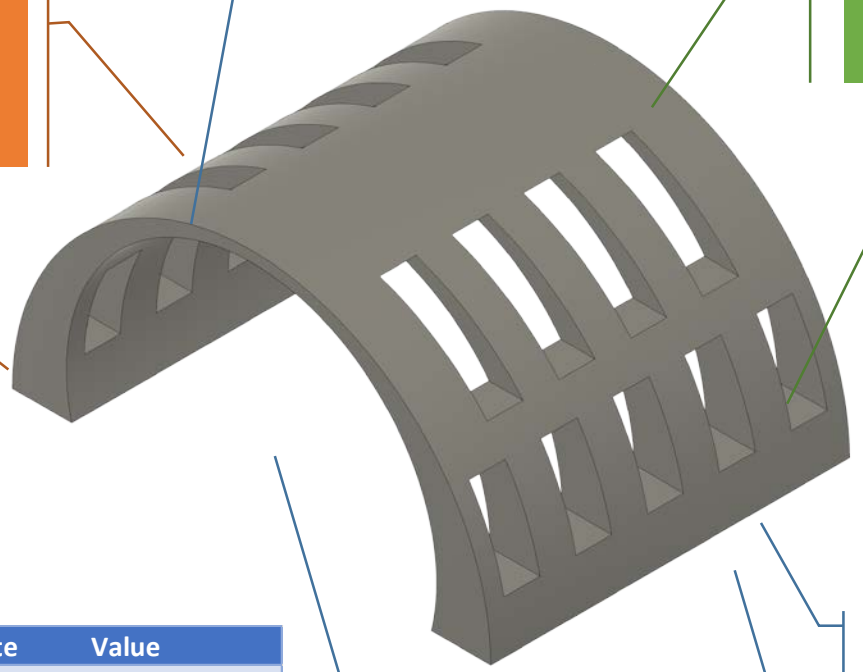
Denitrification on Shell Surface (Caffrey et al 2016)
- 0.1 lb/yr/scaffold
- 110 lb/yr/mile

Living Shoreline Protection
- 1100 scaffolds per mile of shoreline
- Value up to $2.5 million per mile

Carbon In Shell (Dehon 2010)
- 135 kg CO2 per scaffold
- 149 MT CO2 per mile

Oyster Restoration (Dehon 2010)
- 900 lbs or 3500 oysters per scaffold
- 495 tons or 3.9 million oysters per mile

Nutrients In Shell (Newell & Mann 2012)
- 1.8 lbs N; 0.54 lbs P per scaffold
- 1980 lbs N; 594 lbs P per mile



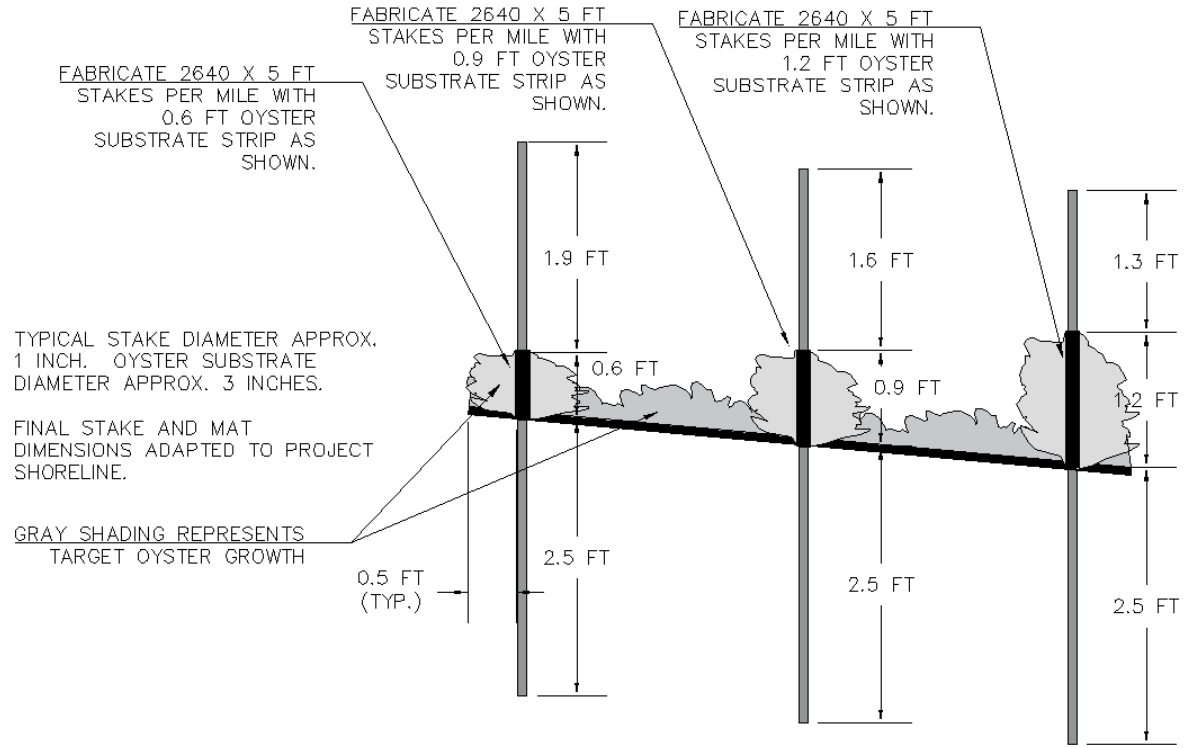
Buried Carbon
- Research need

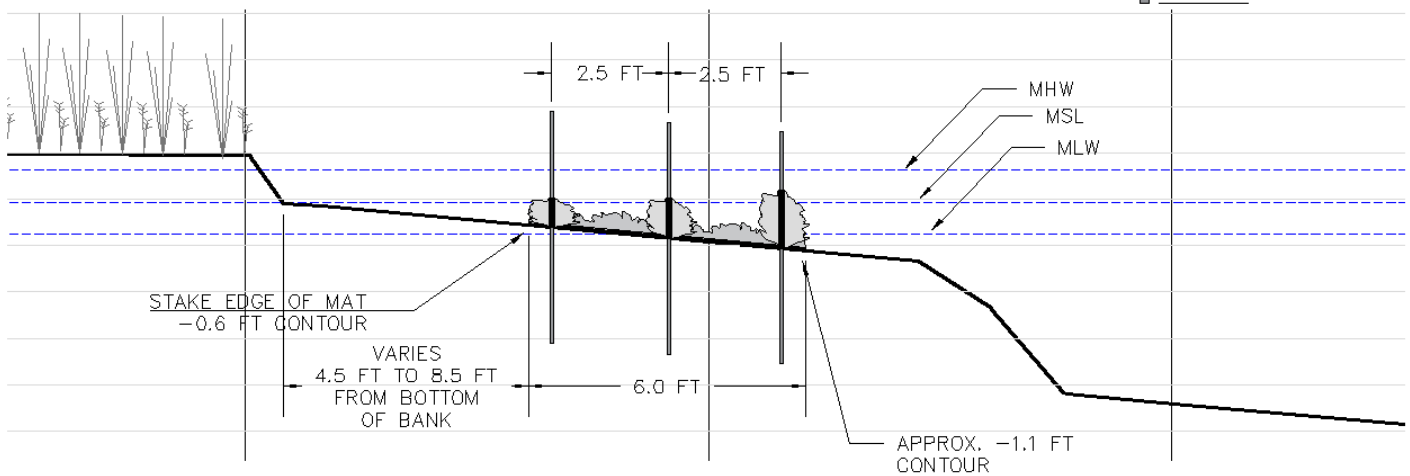
Buried Nutrients
- Research need

Benthic Denitrification
- Research need

Item	Units	Rate	Value
Shoreline Protection	LF	$ 350.00	$ 1,848,000.00
Oyster Stock	lb	$ 0.50	$ 495,000.00
Carbon in shell	MT	$ 12.95	$ 1,929.55
Nitrogen in shell	lb	$ 8.00	$ 15,840.00
Phosphorous in shell	lb	$ 8.00	$ 4,752.00
Denitrification	lb	$ 8.00	$ 880.00
		Total value:	**$ 2,365,521.55**

RESTORATION OYSTER COMPANY EXAMPLE SECTION AND DETAIL





General Notes

OUR PLANNED 25 MILE SHORELINE FARM WILL PREVENT THE LOSS OF 300 ACRES OF COASTAL WETLANDS.

(FIVE FT PER YEAR OF PREVENTED LAND LOSS ADDS UP TO 12 ACRES PER MILE OVER 20 YEARS.)

No.	Revision/Issue	Date

ORA estuaries
www.oraestuaries.com

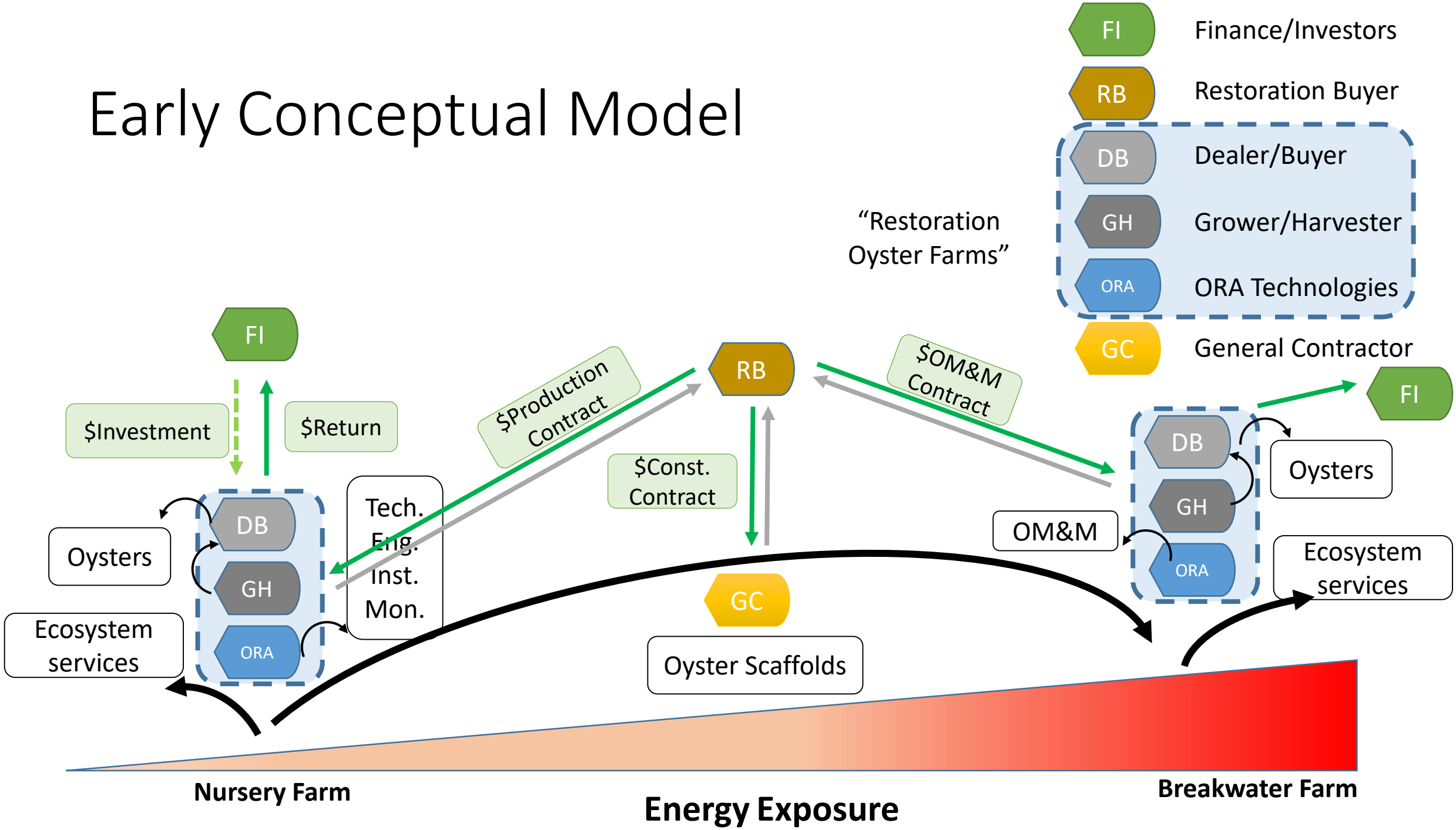
Project Name and Address

RESTORATION OYSTER COMPANY

EXAMPLE CROSS SECTION AND DETAIL

Project	Sheet
RESTORATION OYSTER	X
Date	
Scale NTS	

Early Conceptual Model



Got Oysters?