PLANT-FOCUSED BIOENGINEERING TECHNIQUES IN DYNAMIC COASTAL WETLANDS

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Why so many Coir-Based Bioengineering Products

- Coir resists biological degradation in a marine environment
- Coir photo-degrades in sunlight
- Life-expectancy of coir is well-matched with needs to stabilize sediment sufficiently for establishment of plants in a marine environment

Case Study #1 – Fiber Roll Array
Severe Destabilization Prior

As slope angle was undercut, bank was re-graded to a more stable angle

Installation of Fiber Rolls Using More Robust Methods

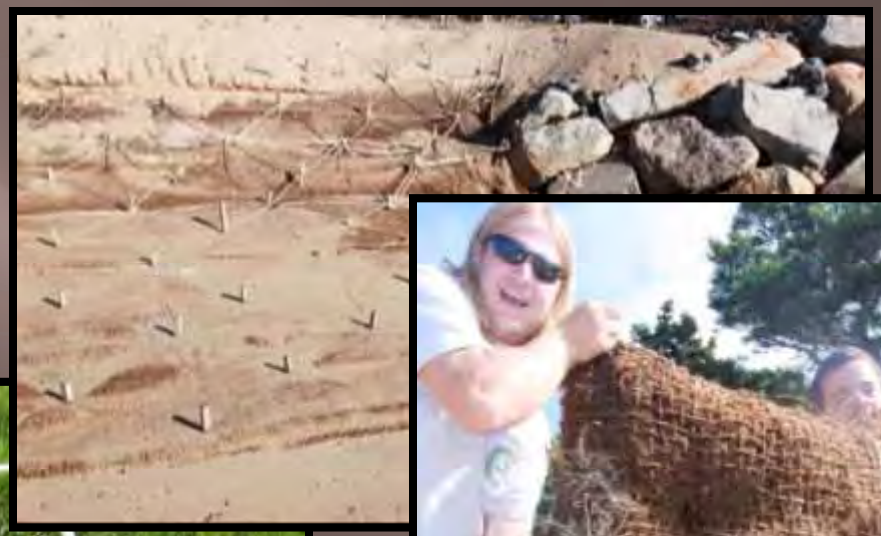
Project was Tested before Completion

Fiber Roll Array Excelled through Hurricane Sandy

Fiber Roll Array Also Excelled through Nemo and March '13 Nor'easter

Following Winter 2012 /'13, array was increased by 90 feet in length

Fringe Salt Marsh Restorations with Coconut Fiber-Based Materials



Case Study 2(a)- Goal: Mitigate End Scour & Construct Fringe Marsh

Heavy Coir Erosion Control Blankets to Hold Sediment During Plant Establishment Period

Initial "Lessons" – Erosion Control Blankets & Planting Not Sufficient

2nd Try – Coir Pillows are Well Vegetated Prior to Installation

Importance of Fringe Marshes in Coastal Stabilization is Frequently Overlooked

- Fringe Marshes can intercept storm energy & stabilize fluctuating beach elevations, which protects nearby upland resources from erosion

"Simulated Salt Marsh" Pre-Vegetated Peat Shelf / Fringe Marsh

After 1st Winter – Plants Dormant, Bioengineering is in Great Shape

Case Study 2(a) – Vegetation did not take and project not a success

Case Study 2(b)- Learning from other Wilkinson Eco. Projects in Same Estuary

Initial Installation of Coir Blankets Followed by Immediate Planting

Case Study 2(b) – Great Colonization in 2nd & 3rd Years

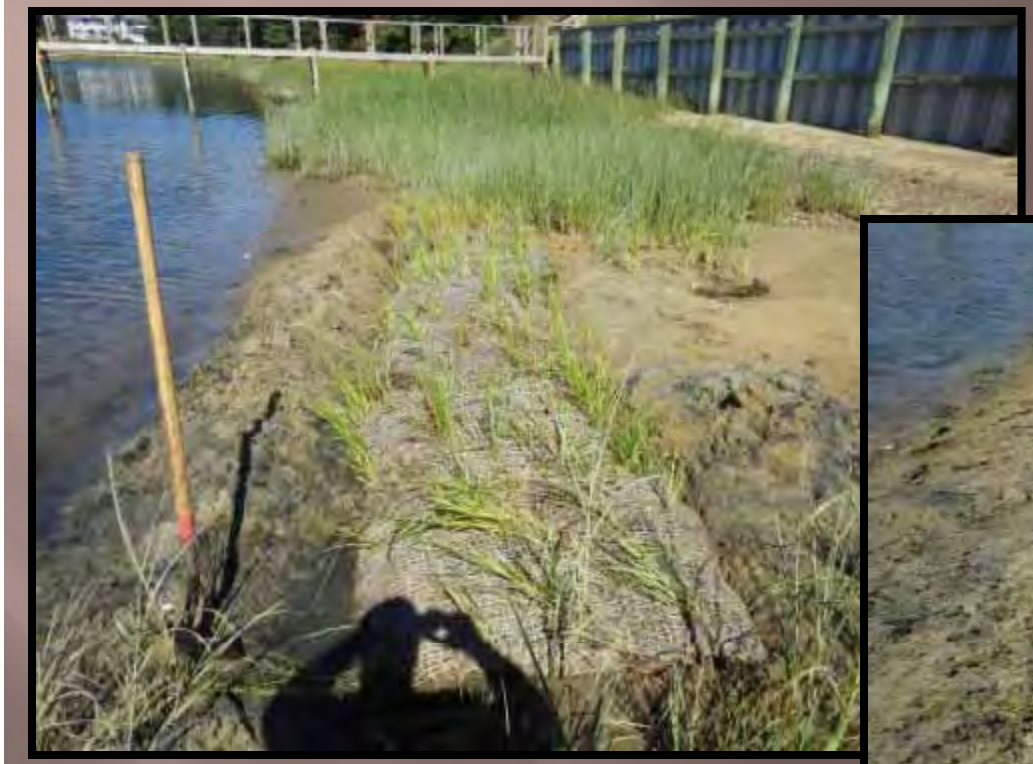
Case Study 2(b) – Monitoring Data & Algae Colonization

Case Study 2(b) – Storm Performance

POST SANDY

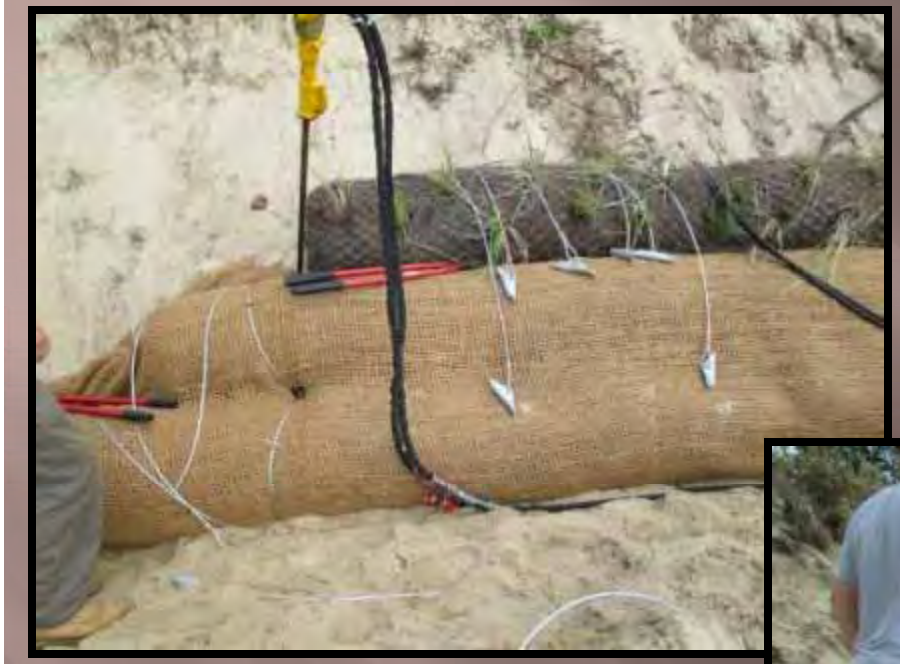
POST NEMO

Combining Lessons Learned in Case Study 2a & 2b to Achieve Successful Salt Marsh Restoration



Case Study 3 – Pre-Vegetated Fiber Rolls

Installing Fiber Rolls with a Season's Growth Ahead

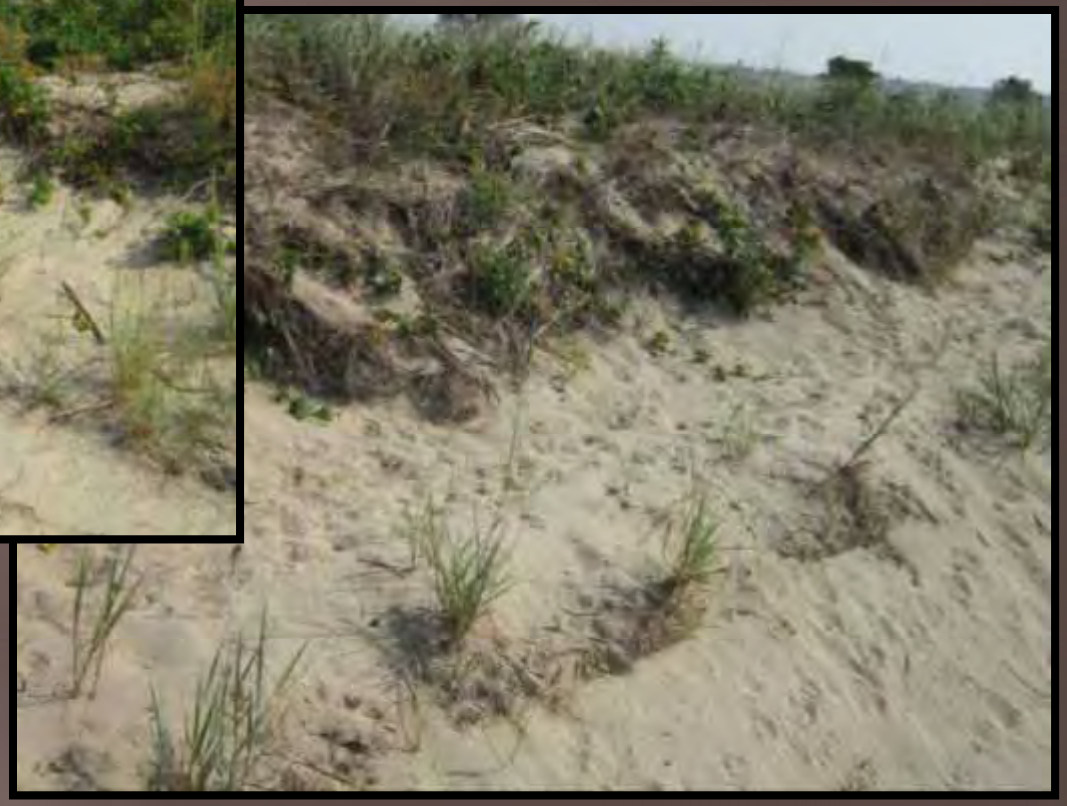


Coir Fiber Rolls are Buried to facilitate Plant Growth & Sunscreen

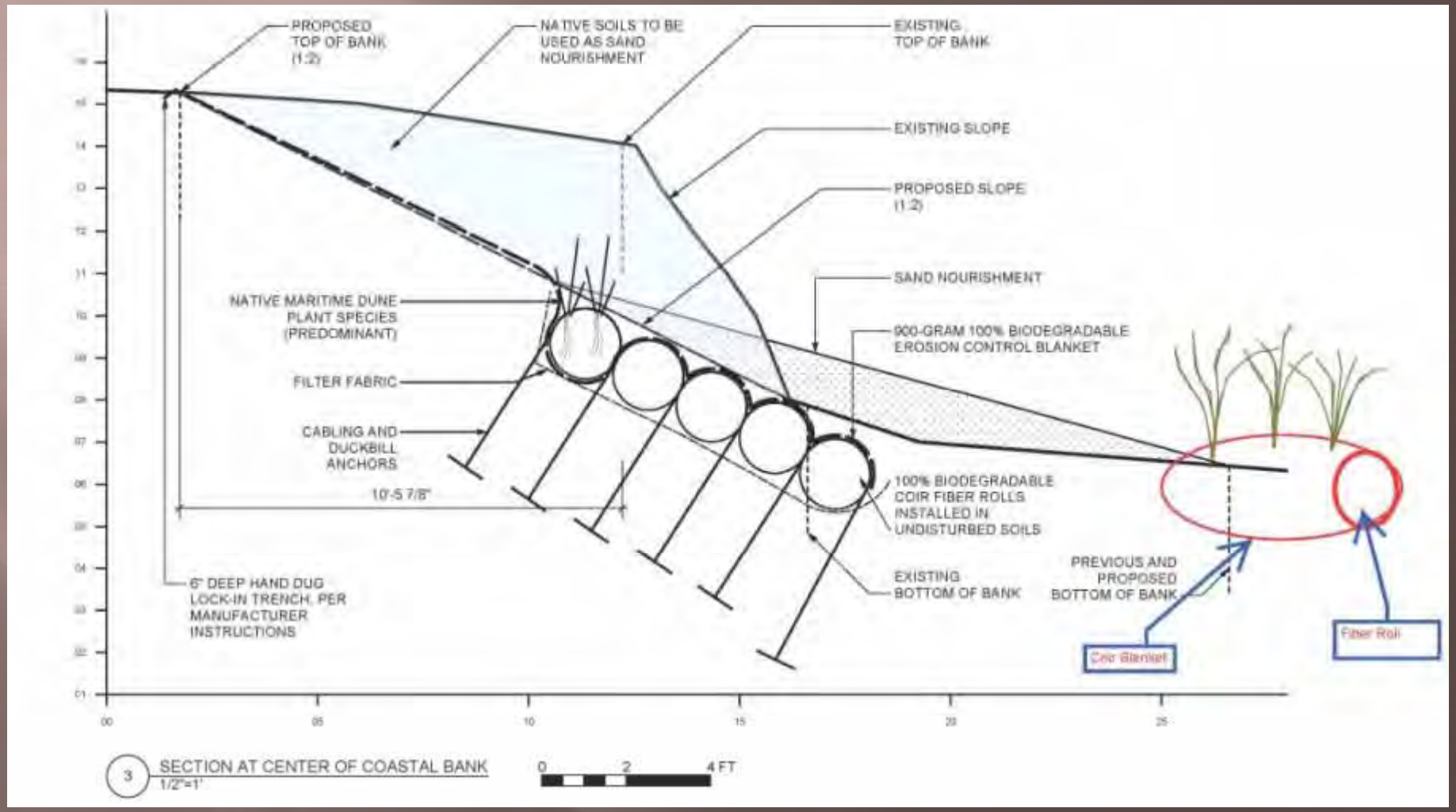
Case Study 3- Post Sandy

Case Study 3- Post Nemo

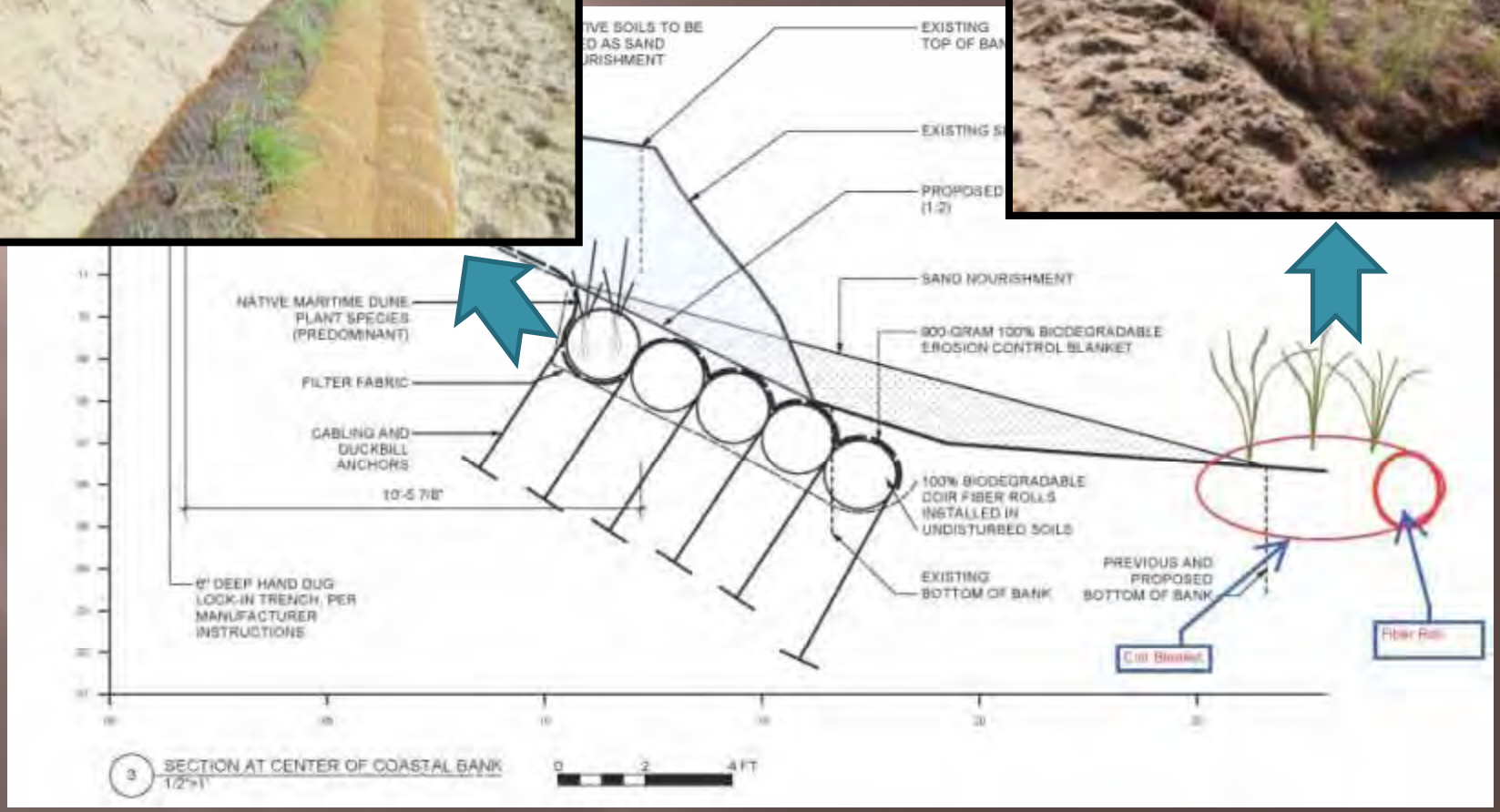
Case Study 3 - 1st Growing Season



Combined Strategies to Stabilize Beach Elevation and Manage Erosion



Pre-Vegetated Fiber Rolls Used with Pre-Vegetated Marsh Mats



The Future? Progressive Salt Marsh Creation in the Netherlands

Thank you for listening

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