

Developing New Shoreline Protection Techniques

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Who is the Marine Resources Council?

- MRC was founded in 1983 by Florida Tech professors and is a 501 c(3) organization devoted to protecting and restoring the Indian River Lagoon (IRL) through sound science
- SEA Change

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Shoreline Development in Florida

Land use changes from the growing population and urbanization in Florida and throughout the world have altered coastal ecosystems.

Along Florida's coasts, many habitats have been altered or removed to accommodate booming population growth.



Shoreline Hardening Stabilization Techniques

Seawalls & Bulkheads

- Long-term solution against flooding and storms
- Expensive
- Causes beaches to disappear
- Bottom scouring
- Not recommended by FDEP or NEP
- Can change the gradual sloping profile to a right-angle
 - Eliminates intertidal habitat
- No filtration of runoff from land to estuary
- No fish and wildlife habitat
- Blocks migratory pathways for plants and animals

Living Shoreline Restoration

- Nature-based solutions to shoreline erosion and tidal flooding
- 3 categories
 - Natural living shorelines
 - Hybrid living shorelines
 - Structural living shorelines

The Importance of Riparian Buffers

Carbon Sequestration

Plants capture and store carbon dioxide from the atmosphere.

Supporting Wildlife

The vegetation provides a habitat for wildlife.

Connectivity

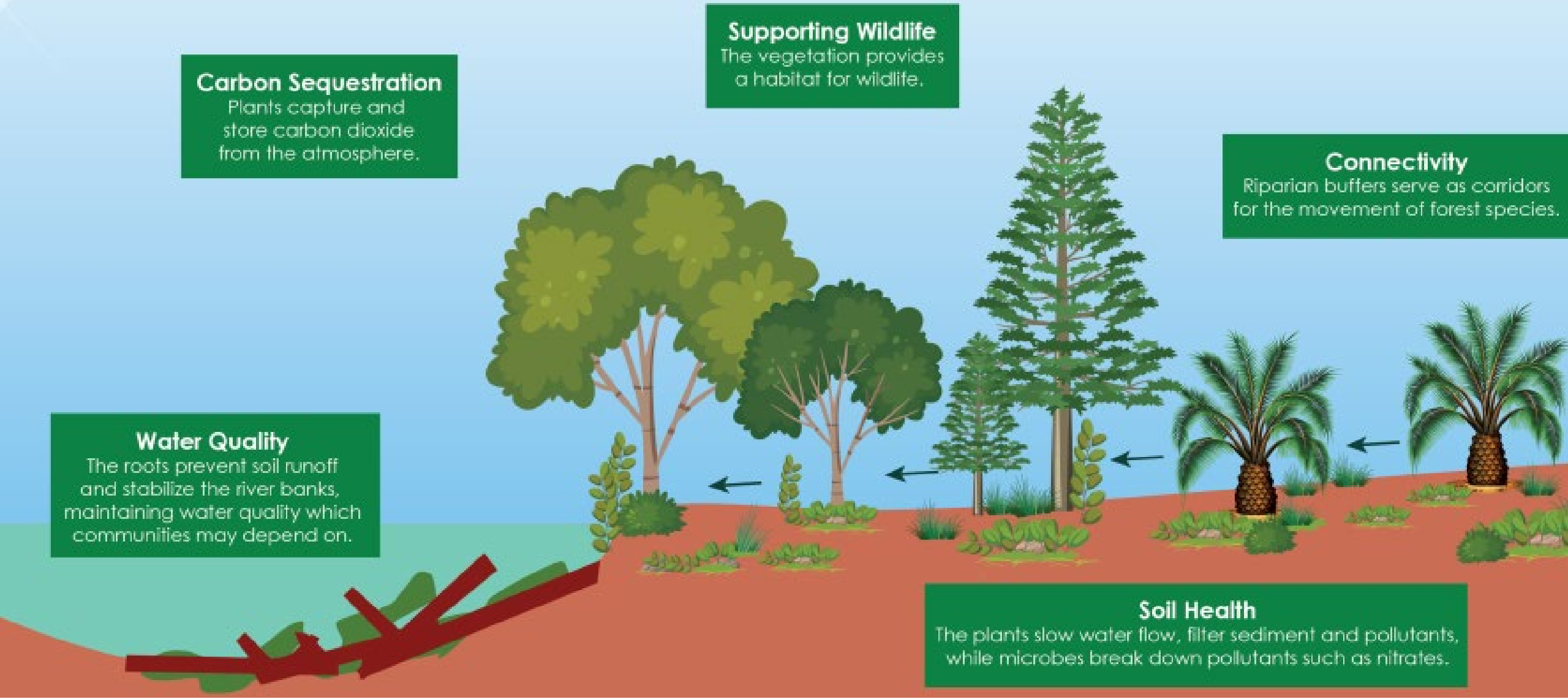
Riparian buffers serve as corridors for the movement of forest species.

Water Quality

The roots prevent soil runoff and stabilize the river banks, maintaining water quality which communities may depend on.

Soil Health

The plants slow water flow, filter sediment and pollutants, while microbes break down pollutants such as nitrates.





Living Shorelines



Partial Living Shoreline



No Living Shoreline

Mangroves

- Habitat for thousands of species at all levels of marine and forest food webs
- Breeding grounds for fish, shrimp, crabs, and other shellfish
 - 75% of commercially caught fish depend on mangroves
- Absorb 70-90% of wave energy
- Filters of nitrates and phosphates
- Natural carbon sinks
- Reduce erosion– build shorelines



2024 Reef Arch Hybrid Deployment

- **Problem:** Eroding shoreline, bluff destabilization, unhealthy shoreline
- **Solution:** Hybrid living shoreline with structural breakwater and native vegetation planting
- Deployed 37 Reef Arch modules in late March 2024
- Mangrove planting in late June 2024

2024 Reef Arch Hybrid Deployment

- Ease of permitting
- No heavy machinery or barge
- Deployed in 4 days with small crew







Thank you!

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