Integrating oyster farmers into oyster habitat restoration in the Florida Panhandle

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Abstract

This project integrates oyster farm byproducts into habitat restoration, enhancing ecosystem services while engaging aquaculture farmers in conservation. Using biodegradable mesh bags, oyster materials were deployed at intertidal reefs, monitored via drone imagery, GIS analysis, & biological sampling.

Top Left: Site monitoring.
Top Right: Oyster shells in mesh bags.
Bottom Left: View of restoration site from boat.
Bottom Right: Eastern oyster, *Crassostrea virginica*.




Introduction

Oyster reefs provide crucial ecosystem services, but populations have dramatically declined. Traditional restoration relies on recycled, cured oyster shell, but sourcing these materials is becoming increasingly difficult. This project explores creating a sustainable model for integrating aquaculture waste supplies into restoration.

Materials & Methods

Local oyster farm byproducts, including discarded shells & culled oysters, were packed into mesh bags, providing a stable substrate for oyster spat attachment & reef development.




Top Left: Oyster farmers gather & ready the material for deployment.
Top Right: Farmers deploy material at restoration sites.
Photos: Southern Oyster Farms
Bottom Left: Setting up GPS coordinates for site.
Bottom Right: Preparing for drone survey.
Below: Location of Oyster Bay.

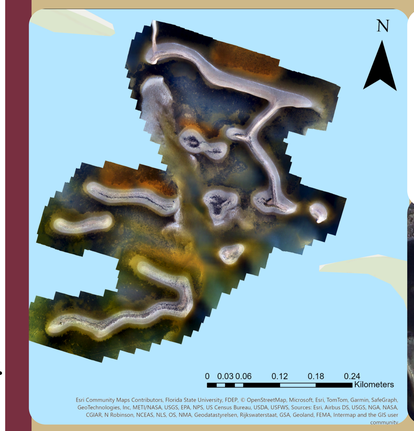
Site Selection & Monitoring: Intertidal sites in Oyster Bay, FL, were selected based on salinity, water depth, & sediment composition. Drone imagery & GPS mapping tracked reef expansion & structural integrity.

Material Deployment & Tracking: Farmers deployed byproducts at designated sites, receiving $10 per 10L of material used. Each deployment was documented with GPS coordinates to track material placement & reef progression.

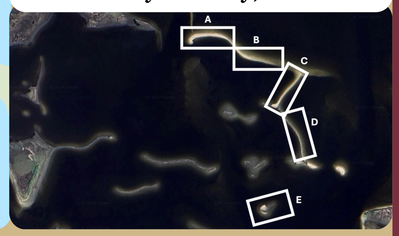
Future Sampling & Farmer Feedback: Ongoing assessments include quarterly sampling of oyster recruitment, survival, & predator presence. Farmers will be surveyed to gauge perceptions of integrating byproducts into restoration, ensuring stakeholder engagement in future conservation efforts.

Preliminary Results

Initial surveys showed 5500 L of oyster byproducts deployed, with ongoing monitoring of spat recruitment, oyster survival, & quantified reef expansion.



Left: Site map from drone survey overlayed onto GIS software.
Below: Intertidal restoration sites in Oyster Bay, Florida.



Discussion & Conclusion

Integrating aquaculture byproducts into reef restoration is a feasible, cost-effective approach, with biodegradable bags showing promise as sustainable alternatives to plastic.

Farmer participation highlights the potential for mutually beneficial partnerships, enhancing both restoration efforts & economic incentives.

Drone surveys provided accurate, high-quality monitoring data at a relatively low cost, supporting long-term assessment.

However, scalability may be influenced by farmer participation & seasonal material availability.

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