

Vertical Oyster Garden Community Education and Outreach Program

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Abstract

Coastal ecosystems are increasingly threatened by pollution, habitat loss, and climate change, prompting the need for innovative, community-driven restoration solutions. This study explores the use of Vertical Oyster Gardens (VOGs) as a tool for public engagement and environmental education through community-based outreach efforts. VOGs, constructed from recycled oyster shells suspended from docks, serve as effective, scalable habitat structures that support oyster population recovery and natural water filtration. This project involved planning and implementing a series of community outreach events across the Tampa Bay area, during which 555 participants constructed 100 VOGs using recycled materials. These events targeted diverse audiences—including students, families, and environmental organizations—through hands-on workshops and educational booths. Outcomes were measured by participation levels, VOG construction, and community feedback. Findings indicate that VOG-based outreach successfully increased public awareness, encouraged cross-organizational collaboration, and initiated early-stage conservation action. This work supports the broader adoption of VOGs as a cost-effective, accessible, and legally compliant strategy for building ecological resilience and community engagement in coastal restoration.

Introduction: Vertical Oyster Gardens (VOGs)

Coastal and estuarine ecosystems are facing increasing environmental pressures from urbanization, pollution, and climate change, leading to significant degradation in water quality and habitat loss. Among the many strategies being explored to address these challenges, the restoration of oyster populations has emerged as a promising nature-based solution. Oysters not only contribute to ecosystem health through their water filtration capabilities but also support biodiversity and shoreline stabilization (Tampa Bay Watch, n.d). Vertical oyster gardens (VOGs), a scalable and accessible method of oyster restoration, have gained attention for their potential to engage local communities in hands-on environmental stewardship.

This paper explores the use of vertical oyster gardens as a dual-purpose tool: enhancing water quality through natural filtration and serving as a platform for community education and engagement. By integrating ecological restoration with experiential learning, VOG programs can foster environmental awareness, promote citizen science, and build a stronger connection between communities and their local waterways. Through a review of existing initiatives, case studies, and qualitative data from outreach programs, this research evaluates the effectiveness of VOGs in promoting sustainable water practices and cultivating a sense of environmental responsibility. The findings aim to inform best practices for implementing community-based oyster gardening as a transformative model for both ecological and social resilience.

VOG Basics and Function

Vertical Oyster Gardens (VOGs) are community-based, low-tech tools used to restore oyster populations in estuarine environments, particularly in urban coastal regions like Tampa Bay. These gardens are typically made from recycled oyster shells strung on wire or rope and suspended from docks or seawalls to provide a substrate for oyster larvae to attach and grow (Gulf Shellfish Institute, n.d.; Tampa Bay Watch, n.d.). As oysters mature, they offer critical ecosystem services such as water filtration and habitat provision. VOGs are effective, scalable systems that engage citizens in restoration through programs such as those led by the Gulf Shellfish Institute, which integrate education, citizen science, and ecological monitoring.

Programs like “Shells for Shorelines” demonstrate the low-cost, scalable nature of VOG projects. Recycled oyster shells from local restaurants are cleaned and cured before being repurposed into VOGs, transforming food waste into a valuable ecological resource (Devega, 2024). These projects are supported by funding from the National Oceanic and Atmospheric Administration (NOAA) and community partnerships, making them accessible and minimally invasive to implement.

Ecological Benefits: Water Filtration, Habitat, and Resilience

Oysters are known for their exceptional water filtration capacity. Each adult oyster can filter 30 to 50 gallons of water daily, removing harmful nutrients like nitrogen and phosphorus, as well as sediment and metals (NOAA Fisheries, n.d.; Chesapeake Bay Foundation, n.d.). This filtration helps reduce turbidity and eutrophication while allowing more sunlight to reach submerged vegetation, thus supporting broader ecosystem health (Sargent, n.d.). As oysters feed, their gill structures trap particles, which are either digested or expelled as pseudofeces, removing pollutants from the water column and depositing them safely on the seafloor (Joosse, n.d.).

Especially in storm-affected areas like Southwest Florida, VOGs act as efficient, nature-based water purification systems (Calusa Waterkeeper, n.d.).

Eastern oysters (*Crassostrea virginica*) are recognized as ecosystem engineers that provide essential habitat in estuarine environments. In Tampa Bay, where oyster populations have declined by 90 percent due to dredging and development, VOGs are now being used to reintroduce habitat complexity (Vaerenbergh, n.d.). Studies show that VOGs attract a wide array of marine life—including barnacles, sponges, worms, shrimp, and small fish—indicating their potential to replicate the ecological functions of natural oyster reefs. These artificial habitats not only support biodiversity but also engage local communities in monitoring and stewardship, fostering a stronger connection to coastal conservation.

VOGs also serve as components of living shorelines—nature-based infrastructure solutions that stabilize coastlines while providing ecological benefits. Suspended VOGs help establish reef structures that reduce erosion, promote mangrove growth, and enhance shoreline resilience (Sarasota Bay Estuary Program, n.d.; Florida Sportsman, 2024). These gardens contribute significantly to water quality improvement and act as natural buffers against wave action and storm surge. By enhancing oyster populations in targeted areas, VOGs simultaneously support shoreline protection and estuarine health, offering a sustainable approach to coastal management (Calusa Waterkeeper, n.d.).

Regulatory Compliance

In terms of legal compliance, VOGs align with Florida state regulations. The Florida Fish and Wildlife Conservation Commission (FWC) oversees shellfish aquaculture and requires permits for activities on state-owned submerged lands or for commercial purposes (Parker & Reach, n.d.). VOGs typically use only natural materials such as oyster shells and do not introduce non-native species, thereby complying with Rule 68-5.001 of the Florida Administrative Code, which restricts the introduction of non-native aquatic life without a permit (Florida Fish and Wildlife Conservation Commission, n.d.). In addition, projects may qualify under the Florida Department of Environmental Protection's general permit for low-profile oyster habitat restoration. These legal frameworks ensure that VOGs contribute positively to coastal restoration while maintaining compliance with environmental and aquaculture laws.

A Nature-Based Solution

The purpose of this review is to highlight the ecological benefits, community value, and regulatory alignment of Vertical Oyster Gardens as a nature-based solution for enhancing water quality, supporting biodiversity, and building coastal resilience. The goal is to support broader adoption of VOGs in restoration initiatives by demonstrating their effectiveness, accessibility, and compliance with environmental policy.

Methodology

Planning and Outreach

The planning phase of this project was centered around collaboration with organizations that could provide both materials and opportunities for public engagement. Communities were identified based on their involvement in environmental or marine-focused activities and events. By prioritizing partnerships with organizations that were already established in the community, a wider and more diverse audience was reached, while also helping to enable and refine outreach strategies through repeated engagement.

The first outreach activity was a workshop at the Tampa Bay Ocean Youth Summit, featuring hands-on sessions for college students interested in marine conservation. This was followed by a public-facing booth at the Florida Aquarium, designed to engage a broader audience. Additional outreach included a booth at the City of Oldsmar's invasive species removal event and another tabling event at the Florida Aquarium during World Oceans Day. These events targeted a mix of demographics but were particularly focused on individuals with a marine interest, who were more likely to be open to learning about Vertical Oyster Gardens (VOGs), adopting them, or sharing the information further.

Some events were coordinated in conjunction with existing community efforts, while others were independently organized. Partnerships with local organizations were essential for securing materials, locating event venues, and facilitating the distribution of VOGs to community members through established outreach systems.

Materials, Construction, and Demonstration

To construct the VOGs, a partnership was formed with Tampa Bay Watch and the City of Oldsmar, both of which operate oyster shell recycling programs that supplied materials for the events. These programs collect used oyster shells from local restaurants, sun-cure them to eliminate bacteria, and drill ½-inch holes in preparation for stringing. The cleaned and pre-drilled shells were then strung on marine-grade nylon rope, typically pre-cut and provided by partner organizations.

For the City of Oldsmar event, 3/8-inch marine-grade nylon rope was independently sourced, and 5-foot sections were prepared using electrical tape to mark cutting points. A heated knife was used to make clean cuts and simultaneously seal the rope ends. Additional materials included a large educational poster featuring visuals and photos of my own VOG installations, which helped illustrate the concept and installation process.

To demonstrate proper installation, a model structure was built using sun-cured driftwood to replicate how VOGs are suspended from docks. Participants were provided with installation guidelines through both the poster and the presentation, which addressed factors such as optimal placement, water flow, dock structure, and secure attachment methods.

Education and Conservation Goals

Education and conservation were the central goals of this project. During workshops, information was delivered through a structured presentation, followed by a hands-on session where participants constructed their own VOGs. For booth-style outreach, education occurred through brief but informative conversations, using a poster as a visual aid. The use of original photographs of completed VOGs helped personalize the message and demonstrate real-world application.

While not every booth visitor created a VOG on-site, they were able to interact with the materials, learn about the purpose and benefits of the gardens, and, in some cases, take home a completed VOG. This multi-level engagement strategy helped foster both environmental awareness and active participation in local conservation efforts.

Outcomes

Tangible Impacts and Community Engagement

The primary goal of this initiative was to educate the public on Vertical Oyster Gardens (VOGs) and engage them in hands-on community restoration efforts that promote environmental stewardship while providing direct community benefits. The overarching purpose was twofold: to enhance water quality and to support the restoration of oyster populations through conservation practices.

Success was measured by two primary metrics: the number of individuals reached and the number of Vertical Oyster Gardens constructed. Across four events, a total of 555 individuals participated, resulting in the construction of 100 VOGs. These outcomes indicate a substantial level of engagement and productivity over the course of the project.

Community involvement varied across the four events, highlighting broad demographic participation. At the Tampa Bay Ocean Youth Summit hosted at Eckerd College, the event—organized by Mia McCormick from Environment Florida—primarily attracted college students from Florida and nearby states. Events held at the Florida Aquarium engaged a wide audience, including families, children, and international visitors. Meanwhile, the event in Oldsmar drew participation from local middle and high school students.

Educational materials were distributed to all participants, including cards summarizing the purpose and benefits of VOGs, along with a QR code for tracking purposes. Participants built

the VOGs themselves using recycled oyster shells (pre-drilled with half-inch holes) and pre-cut, sealed marine-grade nylon rope provided by shell recycling programs. Participants had the option to take the VOGs home if feasible, further extending the impact of the initiative beyond the event itself.

Geographic Scope

The outreach events were held throughout the Tampa Bay area. Each location was chosen strategically to maximize accessibility and to engage a diverse cross-section of the community.

Environmental and Educational Benefits

Early anecdotal ecological observations indicate promising benefits, such as increased interest in local marine restoration and improved awareness of oyster reef ecosystems. Community feedback was overwhelmingly positive. Participants reported that they not only enjoyed the experience but also gained valuable knowledge and a sense of empowerment through their contribution to local conservation efforts.

Visual and Outreach Summary

A collection of photographs and figures documents the installation process and outreach efforts, showcasing successful community participation and the educational nature of each event. The visual documentation reinforces that the events were well-executed and effectively conveyed the intended environmental message.

Discussion

Interpreting Outcomes and Community Response

The outcomes of this project demonstrate meaningful progress toward the primary goal of public education and community engagement in Vertical Oyster Gardens (VOGs). The community response was both positive and enthusiastic, with participants showing a clear interest in conservation and hands-on involvement. Not only did these events reach more than 500 individuals, they also fostered collaboration between individuals and organizations. The project's growing visibility culminated in attention from a larger-scale VOG initiative involving the University of Florida, Pinellas County, and Sea Grant, indicating its broader potential impact.

Environmental and Conservation Impact

The construction and distribution of VOGs at these educational events represent tangible contributions to environmental restoration. VOGs help filter water and create habitats that support the recovery of oyster populations, both of which are critical for improving coastal ecosystem health in Florida. By empowering participants to build and, when possible, install their own VOGs, the project helped bridge the gap between awareness and actionable conservation efforts.

Role of Public Engagement

This project reinforces the essential role that public engagement plays in successful conservation work. When people are informed, involved, and feel ownership over environmental

issues, they are more likely to become advocates for long-term change. The events demonstrated that building a strong, educated community—especially among youth and families—is a foundational step in driving sustainable action. Public voices, when organized and activated, can influence policies and practices at local and regional levels.

Challenges and Limitations

Despite the successes, the project encountered several limitations. A key challenge was the limited reach of implementation—many participants did not have access to saltwater docks and therefore could not install the VOGs they created. Additionally, the project was still in its early stages, and there was insufficient time to observe measurable ecological impacts such as improved water quality or oyster population growth. These limitations suggest that long-term monitoring and follow-up are needed to fully assess environmental benefits.

Lessons Learned

Several important lessons emerged from organizing and executing the events. Successful public engagement requires clear communication, thoughtful presentation, and the ability to connect emotionally with an audience. Organizational skills were also essential to manage logistics, ensure smooth execution, and track participation and outcomes. Collecting data during events proved valuable for measuring impact and establishing credibility, underscoring the need for effective evaluation tools in future efforts.

Future Directions and Program Expansion

Looking ahead, there are opportunities to expand and refine the program. One improvement includes encouraging participants to sign VOG implementation forms to track

follow-through. There is also potential to collaborate with additional community partners, such as dock contractors, marine-related businesses, and waterfront restaurants, to scale adoption. Future efforts should focus on shifting from education to broader implementation, while continuing to engage young people and students as key drivers of change.

Establishing long-term educational partnerships will help maintain momentum and broaden the program's reach. Collaborations with schools, aquariums, environmental nonprofits, and local governments can support ongoing public education and awareness. As the program grows, expanding it to new communities across Florida will allow for greater environmental impact and community involvement, building a statewide network of citizen-driven conservation efforts.

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