

Oyster Reef Restoration

Introduction

Jacobs is a world leader in coastal and maritime planning and engineering, balancing the need to provide assets that are resilient to the challenges posed by the coastal environment with careful consideration of environmental effects. We help our clients develop multi-functional, innovative nature-based solutions to deliver sustainable, prosperous coastal environments.

Nature-based solutions such as oyster reefs need to consider a range of biological, chemical, and physical parameters to ensure the successful establishment of natural habitats. Jacobs coastal experts deliver the full range of services to plan, design and, construct integrated and transformative green infrastructure solutions to protect our shores, restore water quality and, support beneficial uses that improve local economies. These services include:

- Data capture and review, including wind, waves, bed sediments, and geomorphology.
- Site topographic and bathymetric survey.
- Wave, hydrodynamic, and sediment modeling.
- Development of critical success criteria.
- Options appraisal to determine the most appropriate reef units from stability and constructability considerations.
- Reef geometric design.
- Preparation of documentation to support relevant permit applications.
- Post project appraisal to determine success.

A well-designed oyster reef restoration scheme can provide multiple benefits, including helping to establish a sustainable coast.

The benefits of Oyster Reefs

Our coastal communities face many challenges from flooding, saltwater intrusion, storm-water pollutants, and erosion. In some coastal areas, green infrastructure such as oyster reefs can help mitigate the impact of sea-level rise by protecting against shoreline erosion and reducing flood risk. Such solutions can also improve water quality, create habitat for aquatic and other species, and enhance ecosystems. Studies have shown that combining green infrastructure with grey infrastructure can be a more economical approach to flood and erosion risk management than implementing grey infrastructure alone. However, the benefits go way beyond economics—green infrastructure transforms communities and enhances the quality of life of those that use the coast.



Why Nature-Based Solutions Make Good Business Sense

Nature-based designs can offer several co-benefits including the provision of wildlife habitat, improvements in water quality, increased carbon storage, and improvements to recreational value. These co-benefits may help internal businesses and open up new sources of financing projects. Potential supporting sources of revenue may include:

- Ecosystem credit markets (carbon, water quality, habitat)
- Natural capital valuation

In the short-term, the oyster reef restoration will increase habitat diversity and provide other key ecosystem services as well as slow coastal erosion.

In the long-term, oyster reefs could maintain the coastline, protecting interior wetlands from further erosion and providing storm surge protection to valuable infrastructure and communities.

- Payments for ecosystem services
- Mitigation banking
- Public-Private Partnership.

Example Projects

Pensacola East Bay Oyster Habitat Restoration Project Phase I, Florida, USA

Phase I of the project completed the monitoring, permitting and design for an approximately 13 km long oyster reef habitat restoration project along the east shore of East Bay in Santa Rosa County, Florida. For this scope of work, The Nature Conservancy (TNC) requested support from Jacobs to develop design drawings and specifications for construction and obtain the necessary permits for construction.

The overall goals of the proposed project were to implement and monitor a large-scale, scientifically based oyster reef habitat restoration project. The primary goal was to design a natural oyster reef to promote settlement and colonization of oyster larvae and other encrusting organisms and become a healthy, functioning oyster reef habitat.

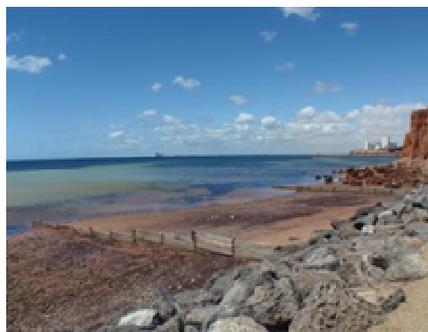


Arlington Cove Living Shoreline, Alabama, USA



Jacobs was commissioned by The Nature Conservancy (TNC) to undertake analytical and design services for the Arlington Cove Living Shoreline Project. The project involved the design of offshore reefs comprised of precast concrete oyster reef units, for coastal erosion protection along 2.5 km of shoreline. The project aimed to deliver habitat enhancement, provide shoreline protection, and promote marsh accretion and re-growth by reducing wave energy in the lee of the new reef breakwaters.

Adelaide Oyster Reef Scoping Study



This study was part of the Great Southern Seascapes program to help restore coastal and estuary habitats across South Australia. The project will see the reintroduction of oyster reefs to coastal areas, which will help to improve water quality and overall ecosystem enhancement. A follow on study saw the construction of the Windara oyster reef in Gulf St Vincent. Jacobs provided advice on required data, site appraisal, and construction options.

Windara Reef, Environmental Restoration, Gulf St. Vincent, South Australia



Jacobs served as the lead engineer for The Nature Conservancy's (TNC) 20-hectare Stage 2 reef expansion. It is a first-of-its-kind shellfish restoration project, with a goal of improving water quality, increase fishery productivity, higher biodiversity, and new opportunity for recreational fishing. Windara Reef will also bring economic and social benefits to local communities through the creation of new jobs and increased opportunities for marine industries.

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This note is for general information purposes only to provide an indication of the range of services Jacobs offers and information on previous projects utilizing these capabilities. It is current as at the date specified below. Exact services and personnel must be confirmed on a project-by-project basis.

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