

Floating Treatment Wetlands Demonstrate Resilience in Marine Environment

Project Location: Port Althorp and Elfin Cove, Southeast Alaska, USA

The following case study demonstrates the capabilities of Floating Island International's (FII) patented floating treatment wetland (FTW) technology to function in a harsh marine environment. Constructed of post-consumer polymer fibers and vegetated with native plants, FTWs mimic the ability of natural wetlands to clean water and provide habitat by bringing a "concentrated wetland effect" to any water body – in this case, two bays in southeast Alaska, located about 45 minutes by air from Juneau.

Overview

The purpose of this floating island application was to study plant survival, biota colonization and BioHaven® durability under marine conditions. This was the first seawater evaluation of FII's BioHaven® FTW.

Two BioHaven® islands were launched—a large module at Port Althorp (the "Port Althorp" FTW) and a small module in a private setting near Elfin Cove (the "Hobbit Hole" FTW). The larger island was moored to a piling at one end and chained to a mooring block at the other; the smaller island was tethered to an existing dock with nylon line. The Port Althorp FTW was constructed as a dock, with Trex decking applied to the top surface.

Installation Data

Location	Southeast Alaska, USA
Environment	Seawater cove
FTW Size	Area of 690 ft ² (64 m ²) for Port Althorp; area of 80 ft ² (7.4 m ²) for Hobbit Hole; thickness of 14 inches (35 cm) for both
Installation Dates	Port Althorp: 9/7/08 Hobbit Hole: 9/8/08
Species Planted	Numerous wild grasses, plants and saplings were planted on both FTWs: beach grasses, rye grass, wild argula seeds, strawberries, silverweed, plantain, geranium, spruce, hemlock and alder. Garden herbs, vegetables and perennial/biennial flowers were also planted.

Operational Data

Average O&M Costs (Labor, Materials)	1 hour/week; no materials
Training Required to Operate	1-day training seminar
Anticipated Lifespan	At least 10 years

Results

- The FTW matrix was not adversely impacted by exposure to seawater and Alaska wintertime temperatures/wave action.
- Numerous marine biota, including mollusks, starfish, worms and filter feeders such as anemone populated the FTWs. Several species of kelp also took up residence.
- Perennial plants survived the winter and reemerged in the spring.
- Both FTWs remained buoyant under snow loads of up to five feet.
- The FTWs remained intact with up to two-foot waves. The mounting bracket that fixed the Port Althorp island to the piling failed, as the joiner plates and bolts were not the ideal size.
- The Port Althorp FTW was towed five miles in the summer of 2009 to the Hobbit Hole location to replace an existing section of dock. It is still in use and performing well.
- Boats were able to tie and moor to the FTW.



Installing the BioHaven® modules



Finished FTW in Port Althorp



Snow load in the winter



Tiny mussels attached to the FTW



Habitat for ocean biota



Spring growth on the FTW