



Floating treatment wetlands with mature marsh grasses green up bulkheads in South Bethany canals.

# South Bethany Floating Treatment Wetlands Improving Water Quality in Poorly Flushed Canals

Project Status:  
Completed December 2019

## Project Summary

### Background

The five miles of poorly-flushed residential canals in the Town of South Bethany are highly impaired by excess nutrients and bacteria, resulting in frequent algal blooms and low dissolved oxygen. Extensive bulkheading has also reduced habitat for fish and invertebrates to thrive. A previous research project demonstrated the feasibility of using floating treatment wetlands to address both of these issues.

### Project Description

One hundred thirty, four- by eight-foot interlocking foam mats were planted with plugs of the saltmarsh grass *Spartina alterniflora* and secured in groups to canal bulkheads. Nutrients in the water are taken up by the plants as they grow and are stored in the plants' tissues. Suspended roots also host microbial films that remove additional nutrients from the water.

### Objective

The goal is to increase oxygen exchange, remove nutrients from the water column, and provide a tool for 'greening' the bulkheads and creating complex habitat - both above and below the water - for aquatic organisms. Center staff conducted analyses to determine whether the floating wetlands removed significant amounts of nutrients from the water.

"Development has added a lot of impervious surface, and rain washes excess nutrients into the canals and the bay" says George Junkin, South Bethany Water Quality Committee. "Our goal is to make the South Bethany canals fishable and swimmable once again."

Outreach and education is also an important component of the project, with a goal of increased acceptance and future adoption of green infrastructure practices by Town residents.

### Project Contact:

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### Project Partner(s):

Town of South Bethany; South  
Bethany Property Owners  
Association

### Funding & Partners:

Total project cost: \$53,022.

Funding partners: Delaware  
Department of Natural  
Resources and Environmental  
Control; Community Water  
Quality Improvement Grant 18-  
01; Town of South Bethany

### Contractor(s):

BeeMats Floating Wetlands

### Project Timeline:

Mats were installed June 2018.  
Project completed in Fall 2019.







Image: *Spartina alterniflora* plants growing in the floating wetland mats.

## Outcomes/Conclusions

The floating wetlands created great habitat in the canals, providing shelter and food for fish, invertebrates, and even birds. Harvesting the top parts of the *Spartina* leaves at the end of the growing season was found to remove only a small portion of the nutrients taken up by the plants from the canal system. Our monitoring suggests that nutrient removal could be greatly increased by completely removing the plants from the mats each fall and replacing them with new plugs in the spring.

## CCMP Focus Area

This project fulfills objectives outlined in the Comprehensive Conservation Management Plan (CCMP) for the Delaware Inland Bays.

- Focus Area: Water Quality Management
- Objective: Reduce nutrient input to residential canals and lagoons

## Clean Water Act

This project aligns with objectives outlined in the Clean Water Act: Total Maximum Daily Load (TMDL) regulations call for a 40% reduction in nitrogen and phosphorus loads to the Little Assawoman Bay.

### Outputs and Outcomes:

- 4,160 square feet of floating wetland islands installed into the canals
- 10,400 plugs of *Spartina alterniflora* planted;
- 500 South Bethany residents educated about green practices to improve water quality in their canals
- Approximately 5 pounds of nitrogen and 0.3 pounds of phosphorus removed annually from the South Bethany canals



Image: Volunteers planted the wetland mats and launched them into the canals.



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