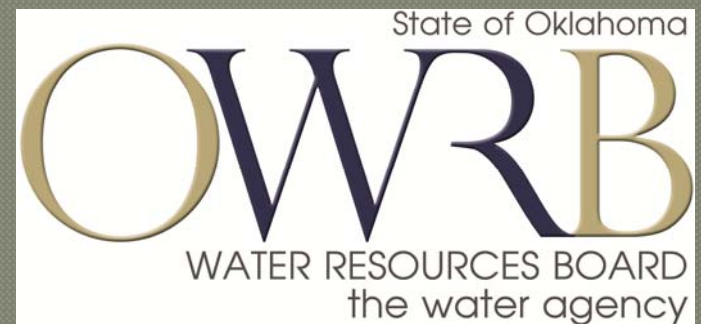


Floating Wetlands in Eucha Lake; What Were They Good For?

Oklahoma Water Resources
Board



Introduction

● Acknowledgements:

- EPA Region 6 Section 319 funds
- City of Tulsa cost share
 - Laboratory Analysis
 - Lake Staff & equipment
 - Construction equipment & operators
- OSU SWFAL plant analysis
- Other cooperators include
 - GRDA
 - ODWC
 - City of Oklahoma City

PVIA Experience



- Plant tissue as nutrient removal mechanism



PVIA Experience



Floating Wetlands @ Eucha Lake

Objectives:

- Document above (plant) and below (Aufwuchs) nutrient removal
- Document aquatic habitat
- Contrast to alternative mitigation tools

Floating Wetlands @ Eucha Lake

Non-woven recycled (plastic) fibers
injected with marine foam

Prefabricated, modular units

Weighted anchoring system

(sediment penetrating recommended)

Variety of native wetland plant species

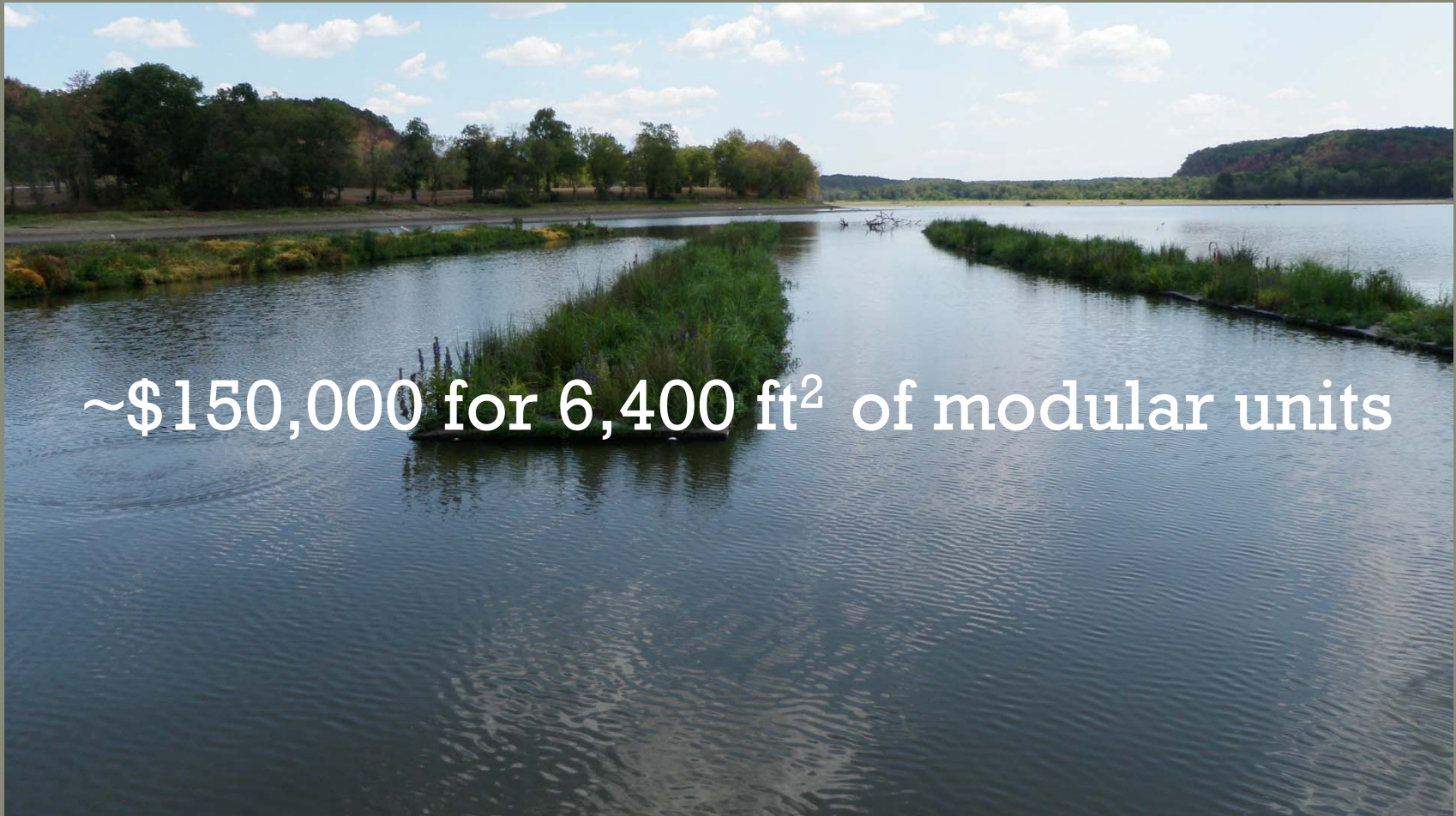
Media

- 5' x 8' mats – 160 total

- 6,400 ft²



Floating Wetlands



~\$150,000 for 6,400 ft² of modular units

Benefits



Floating Wetlands for nutrient removal/sequestering

Aboveground Biomass

➤ 2.3 g TP/m² vs. PVIA 3.2 g TP/m²

Sediment Trap (Aufwuchs)

➤ 84 mg TP/m²/day ~ 30 g TP/m²

\$150,000 for 9.6 kg/yr ~ \$15,625/kg TP
<<15 years later - \$1,042/kg TP>>

What does \$150,000 of Floating Wetlands buy?

YEAR 1:

- Fish Habitat 0.15 acres
- Breakwater 400'
- 19.6kg TP

YEAR 15

- Fish Habitat 0.15 acres
- Breakwater 400'
- 294kg TP





Alternate Methods

Fish Habitat @ Grand & Hudson Lakes

(Founder colonies require annual O&M; replanting)

\$750,000 for 6 years gaining 12 acres

(\$10,416/acre/yr)

For 0.15 acres of habitat

Year 1 ~ \$ 9,872

Year 15 ~ \$148,084

Alternate Methods

Floating Tire Breakwater @ \$156/ft

400' ~ \$62,400

Alternate Methods

Nutrient Removal:

Transport litter @ \$3.40/kg

Hypolimnetic Oxidation
(Capital + O&M)

YEAR 1 \$439/kg TP

YEAR 15 \$ 54/kg TP



Alternative Method Comparison

295 kg TP Removal/Sequester

Floating Wetlands - \$150,000

Hypolimnetic Oxidation - \$ 15,940

Litter Transport - \$ 1,000

Alternative Method Comparison

0.15 acre Fish Habitat

Floating Wetlands –

Year 1 \$150,000

Year 15 \$150,000

Founder Colony

Year 1 ~ \$ 10,000

Year 15 ~ \$148,000

Alternative Method Comparison

400' Floating Breakwater

Floating Wetlands - \$150,000

Tires - \$ 62,400

Floating Wetlands as

Floating Breakwater

2 x more expensive than using Tires

Fish Habitat

15 years to equals Founder Colony cost

Nutrient Removal/Sequester

10 x more than Hypolimnetic treatment

150 x more than litter transport

OWRB Floating Wetlands

Recycled media 80% of cost

Nutrient removal 2^o function

Fish Habitat viable for variable pools

Multiple functions creates narrow niche

Qualifier: there are many ways to achieve the goals of breakwater, nutrient removal or sequestering, and provide fish and wildlife habitat. Direct comparison of the OWRB selected floating wetlands to each individual method is probably not fair as performance varies. Although all efforts were made to create reasonable cost comparisons arguments can be made that some comparisons are more like apples to oranges. To that I might agree but will point out my deuteranopia and encourage said commenter to do better. After all the apples could be golden delicious and orange looks like yellow to me.



POSTLUDE

- Managed Ocala Fl City park
- Non recycled material
- 440 ft² installation for \$2,000
- Cost 20% Eucha installation
 - \$4.5 ft² vs. \$23.4 ft²



Questions

