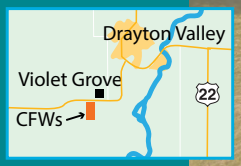
PUTTING NATURE TO WORK:
How Brazeau County is Using Constructed Floating Wetlands (CFWs) to Treat Wastewater

ISSUE
A need to improve wastewater treatment using a green solution

WHO
A collaborative project and research study with Brazeau County, the University of Alberta, and Covey Associates Pty Ltd.

WHERE
The Violet Grove Waste Stabilization Ponds which services the Hamlet of Violet Grove's 150 people (near Drayton Valley)



GOALS: STAGE 1
- Find out if CFWs improve wastewater treatment in cold climates
- Set goals to further study how effective the CFW is for Stage 2 and consider additions or modifications

GOALS: STAGE 2
- Quantify changes in nutrient and pollution concentrations between the pond inlet and outlet
- See whether aeration improves the treatment performance of CFWs
- Find out if the controlled study (mesocosm) produces similar results to the field study
- Determine which plants are best at removing nutrients and metals

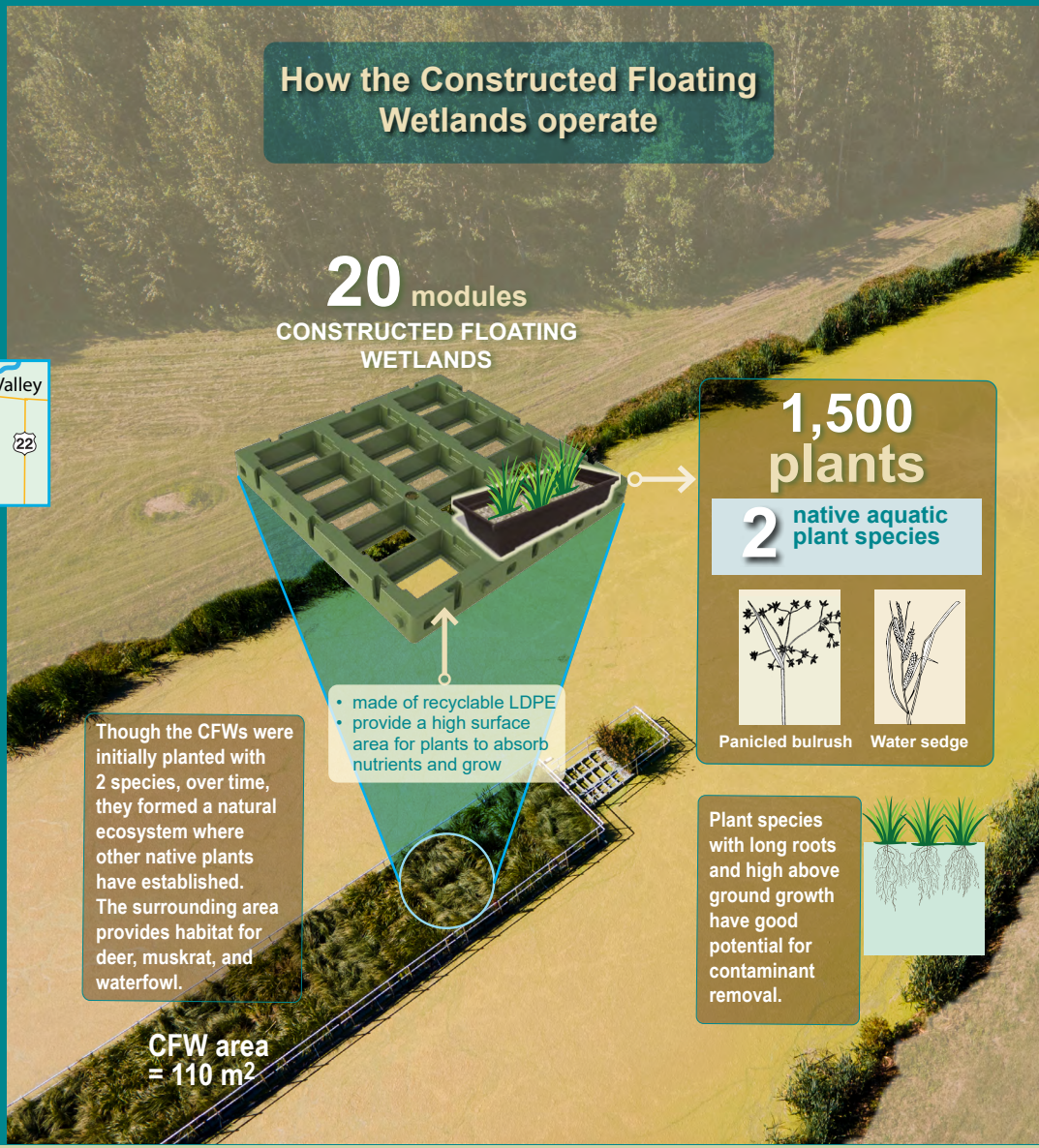


Image of CFW module credits - Coveys: Consutlng and design, Clarity Aquatic: modules.

To read the peer-reviewed paper for this study, go to: https://doi.org/10.1016/j.scitotenv.2023.163115

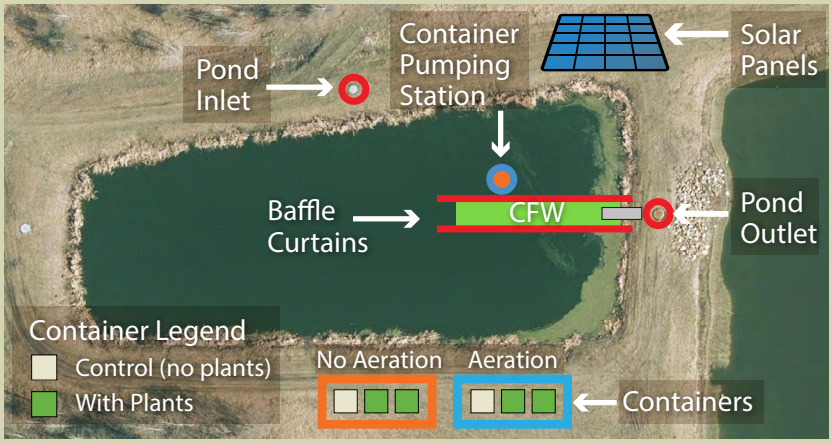
STUDY SETUP & MAP

Mesocosm: A natural environment used for study under controlled conditions.

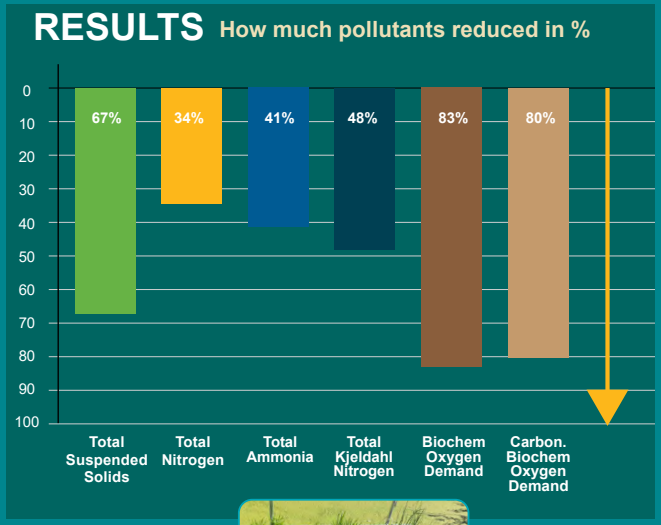
What aeration does

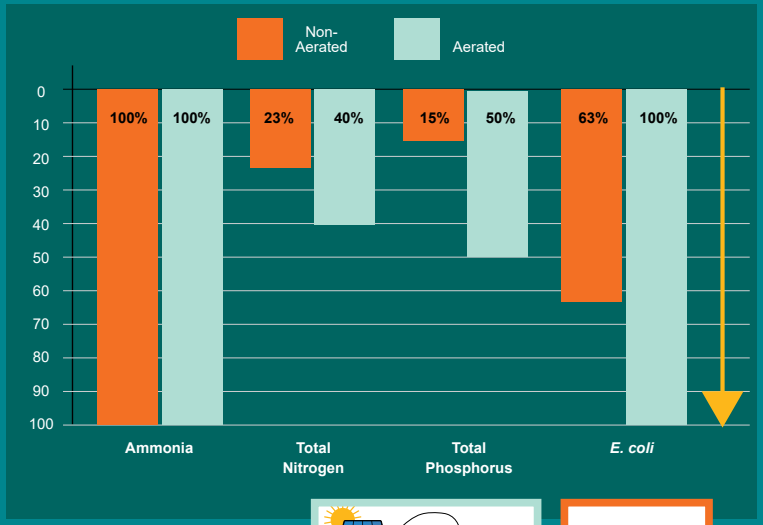
Oxygen levels are generally low in wastewater ponds, so aeration can be used to increase oxygen and improve bacterial nitrogen conversion processes.

Nitrogen (organic in water)
→ converted to inorganic by bacteria
→ back to organic in plant



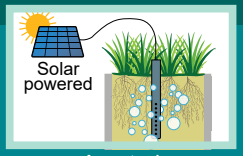
RESULTS How much pollutants reduced in %





Field Study: Pond CFWs (with aeration)

Experimental Study: Containers (with and without aeration)



Aerated

Non-Aerated

KEY FINDINGS

- **CFWs were effective for improving wastewater treatment in cold climates**
- **CFWs were effective in reducing most of the nutrient and pollutant concentrations in the Violet Grove wastewater pond**

NSWA
NORTH SASKATCHEWAN WATERSHED ALLIANCE

For more details about the project from the municipal perspective, see *"Brazeau County News (July/Aug issue)"*.
For more about the science, go to U of A's writeup at *"Floating Wetlands For Water Treatment: Science, Sustainable Management and Education"*.