Comparing DOC & CDOM Concentrations of Tidal Marshes & Aquaculture Farms

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Table of contents

01 Introduction

DOM/Goals

02 Methods

Sites/Methodology

03 Results

Compare & Contrast

04 Discussion

Analysis of DOC/CDOM

05 Mentions

Acknowledgement

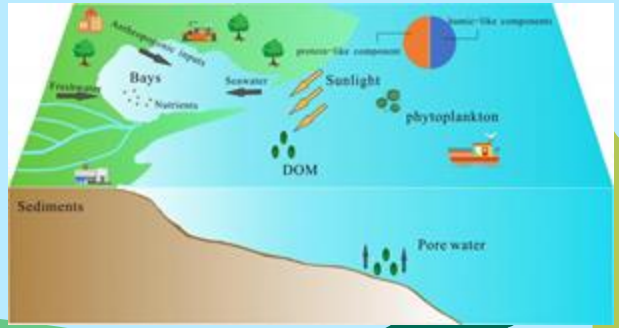
01

Introduction

DOC? CDOM?

Importance of DOM in the Carbon Cycle?

- Dissolved Organic Matter (DOM) originates from terrestrial runoff, decaying marine organisms, and primary production.
- Decomposes by microbes, releasing carbon dioxide and nutrients for phytoplankton use.
- Tidal marshes and mangroves, contribute production and release of DOM

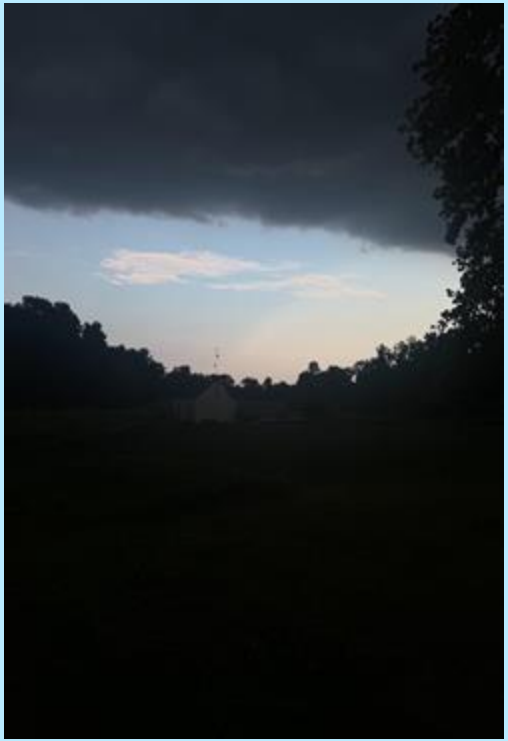


DOC

- Sourced originates:
  a. Decaying plants, animals, and other organic matter.
- Used to assess water quality and ecosystem health.

CDOM

- Organic material in water that absorbs light
- Sources
    a. decaying plants and other organic materials
- Influences water quality and light penetration in water



Goals of My Project

-Collect and measure DOC and CDOM concentrations

-Analyze the differences in DOC and CDOM between tidal marshes and oyster aquaculture facilities

02

Methodology

Methods on how we collect DOC & CDOM?

Sites and Maps

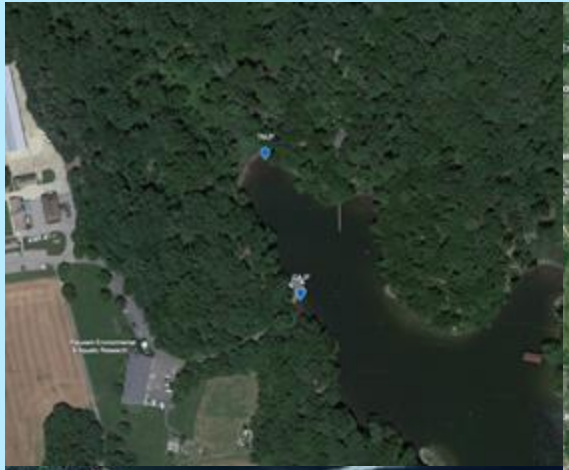
Sites

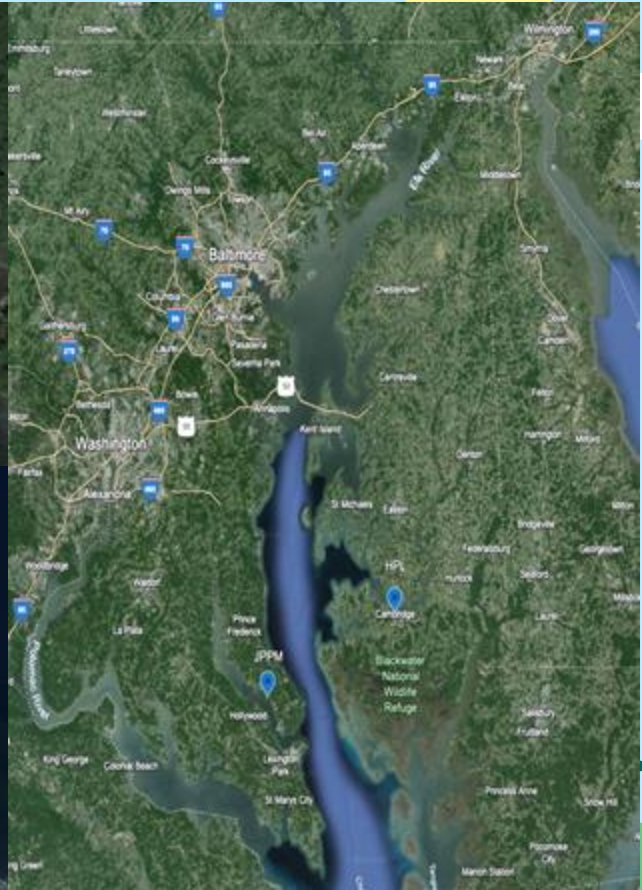
TM: Tidal Marsh

ES: Eastern Shore

JP: Jefferson Patterson

OA: Oyster Aquaculture





Isabela & Luisa

- Teledyne ISCO autosampler
- Collects up to 12 mason jar-sized water samples.

How to prepare for CDOM?

After the first filtration, then

- Filter through 0.2 μm syringe filtered
- Analyze samples on Shimadzu UV-Vis 1900i

Preparing DOC!

Acidification

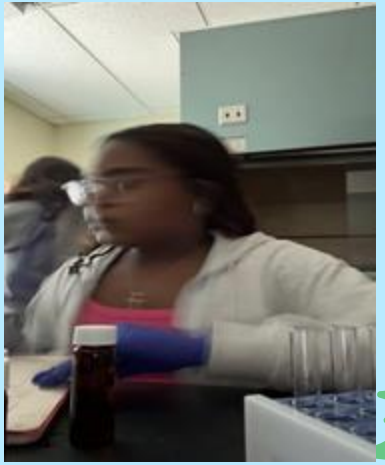
- 25 µL 6 N HCL
- Samples ran through Shimadzu TOC-L analyzer.

KHP Stock (Potassium Hydrogen Phthalate)

- KHP (potassium hydrogen phthalate) is used for the standard curve
- Used KHP stock to make working standards: 0.5, 1.0, 5.0, and 10.0 mg C/L

Prepping DOC Samples

- Using a pipette add 8 mL of each sample in a test tube (1-10)
- Create a Blank
- Pick a random KHP Stock Standard

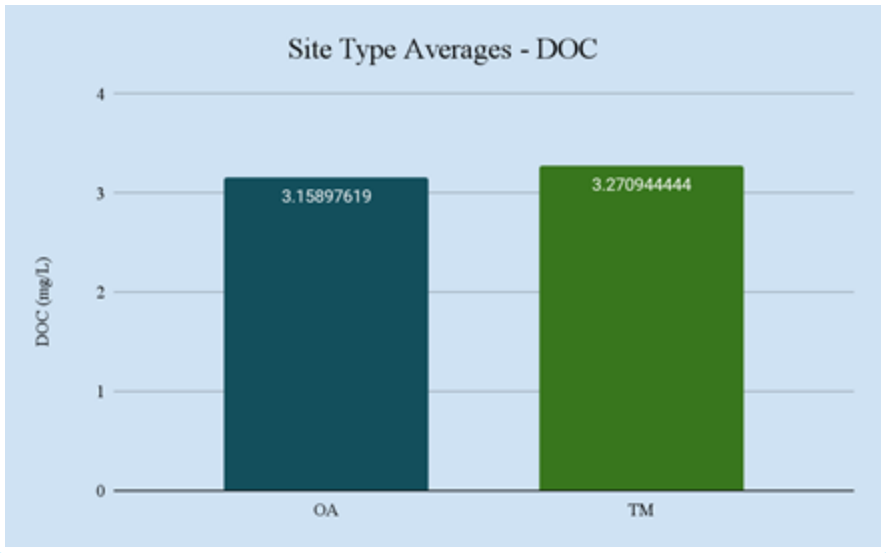


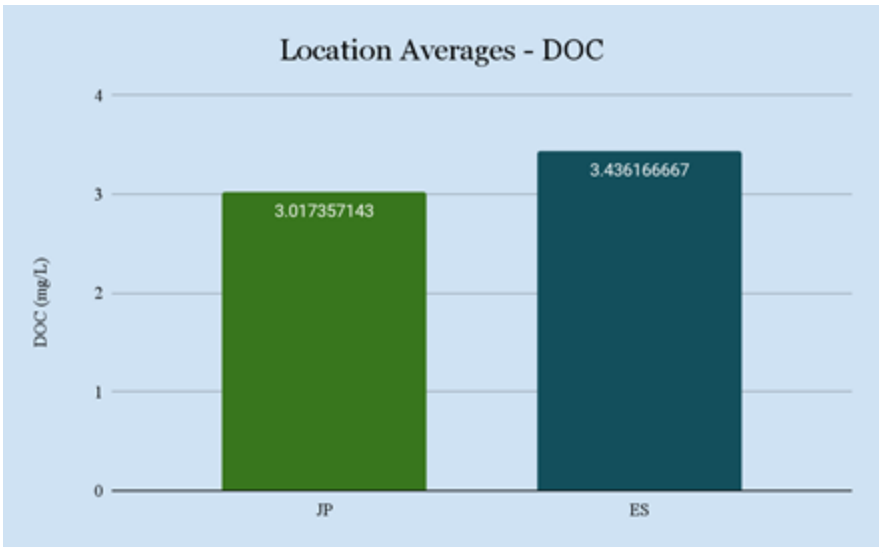
03

Results

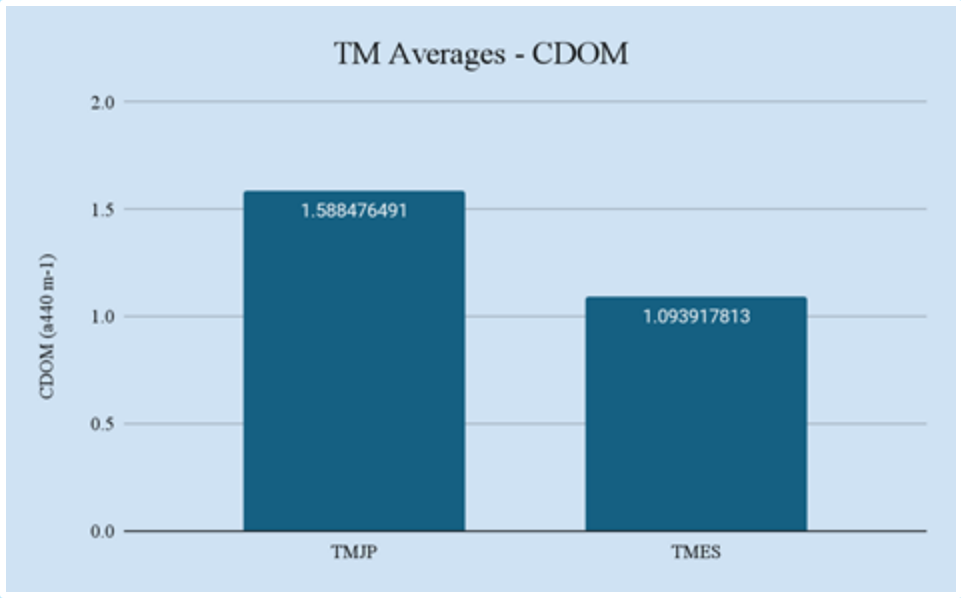
Compare & Contrast

Location x Site Averages DOC

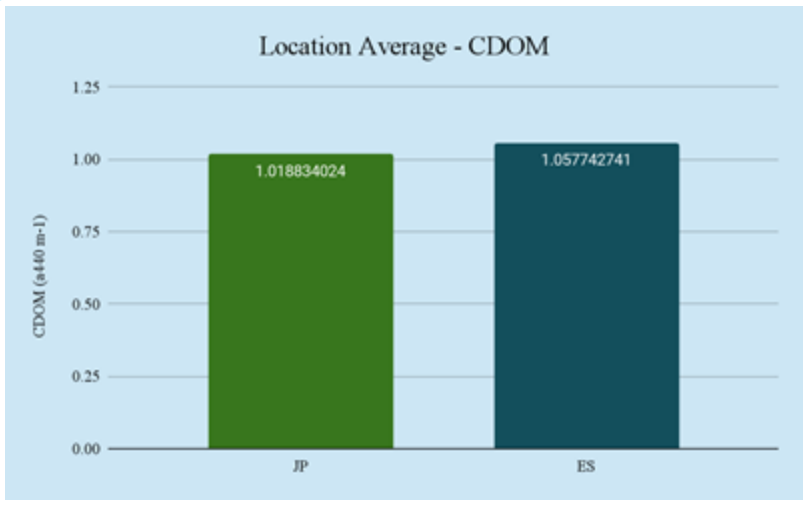


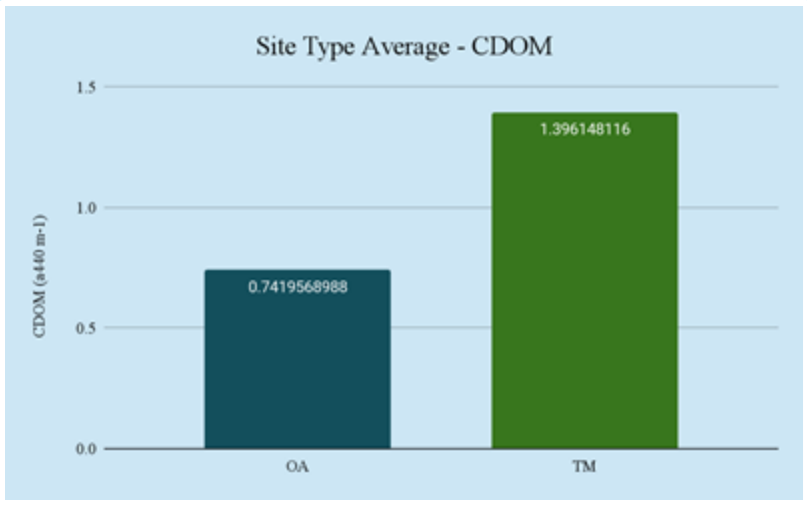


TM - Site Averages



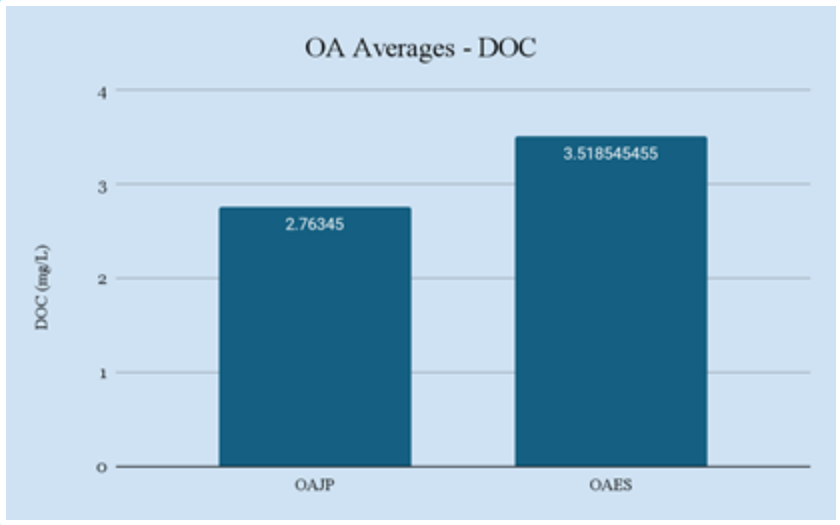
Location x Site Average CDOM



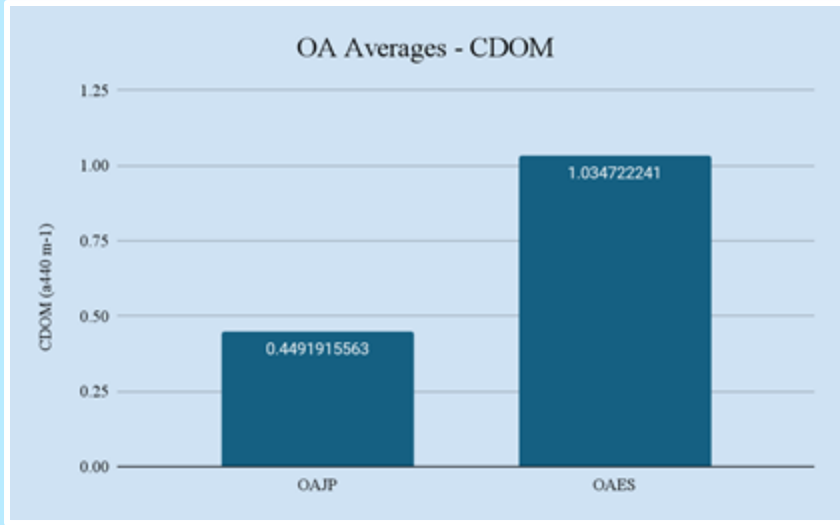


p- value is $p < 0.001$ for Location x Site.
(Statistically Significant)

OA - Site Averages

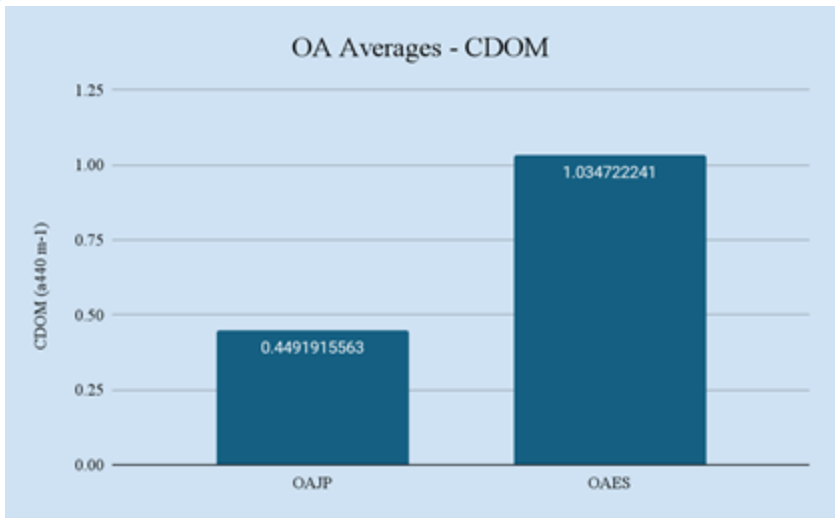


p-value = 0.0280894
(Statistically significantly)

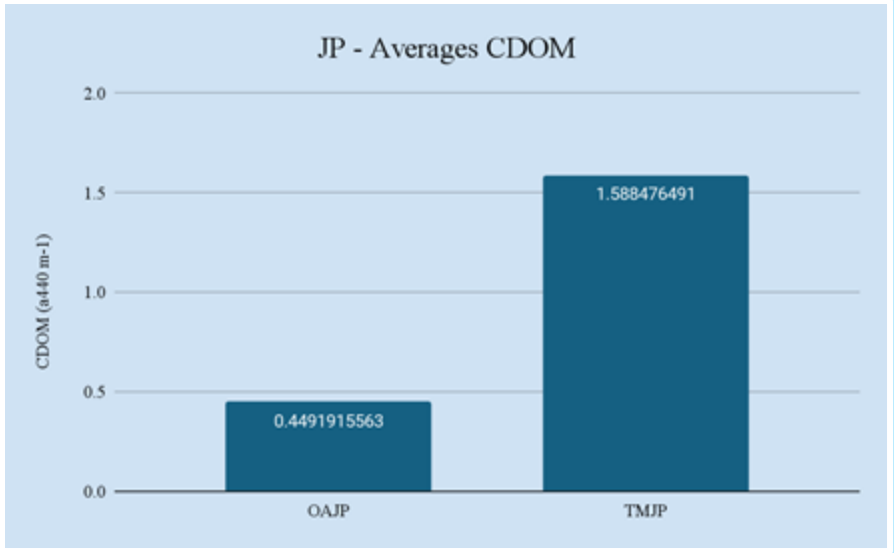


p-value = 0.0005459
(Statistically significant)

Location x Type CDOM



p-value : 0.0005459
(Statistically significant)



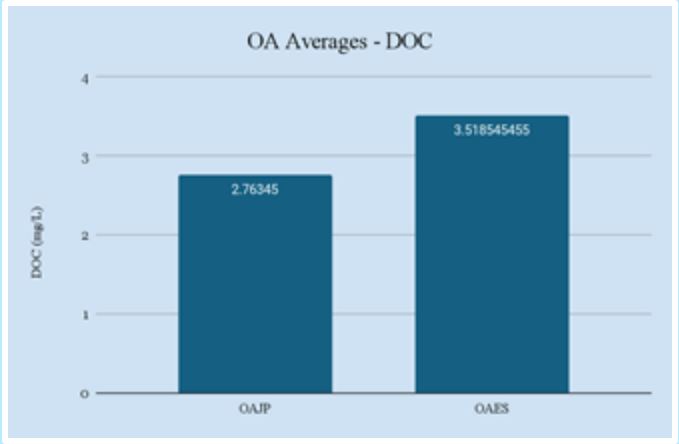
p-value: 0.0000145
(Statistically Significant)

04

Analysis

Goal: Analyze the differences in DOC and CDOM between tidal marshes and oyster aquaculture facilities

- Site Averages CDOM is lower for OA compared to TM
- Differences in DOC between the locations: The lowest average for CDOM was at OAJP
- CDOM was overall more variable between our locations and types of sites then DOC

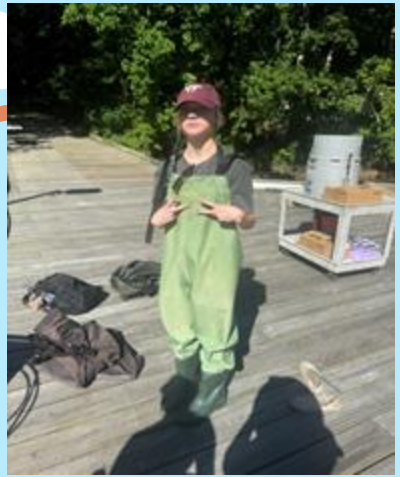


Next Step

- More measurements in different seasons and more locations
- Look more into the interactions between these variables and other variables such as POC, DOM, and more

05

Acknowledgement



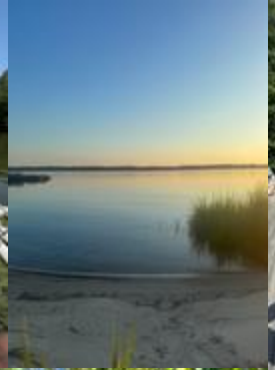
Lilah

Amanda

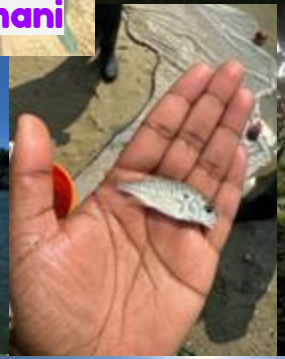
Halina

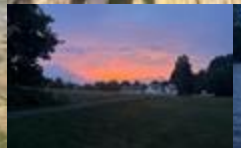
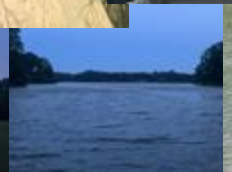
1. Congressionally Directed Spending 2023 (Earmark) “Morgan State University’s PEARL Lab Student Research Enhancements.”
2. Dr.Amanda Knobloch (Best Mentor In THe World!!!
3. Lilah and Haloina (Best coworkers ever)

Imani

Amanda


Lilah



Halina