

**Report of attendance at the World Seagrass Conference Naples June 17th to June 21st, 2024, attended for the 17th June only.**

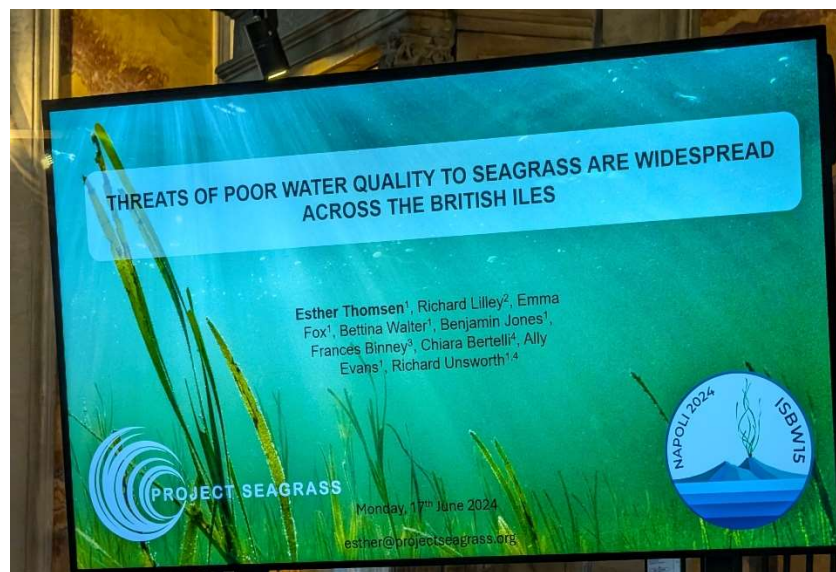
I was delighted to be able to attend the World Seagrass Conference this year, especially since I am the WWF Senedd Seagrass Champion and the President of the World Seagrass Association is currently Benjamin Jones from Project Seagrass based in Bridgend.

I would like to note that my presence representing Senedd Cymru did not go unnoticed, and the organisers were delighted that a parliamentarian had shown interest in the significance of seagrass restoration.

The conference received unprecedented support, with 486 participants from 48 countries, which shows the increased interest that has recently been taken in the restoration of seagrass populations.

My attendance allowed me to network with several groups from around the world as well as learn a great deal more about seagrass. There were several presentations from seagrass scientists based in Wales, the UK and Ireland and it was a pleasure to be able to support the Welsh seagrass community on behalf of Senedd Cymru.

Below are images from one of the Welsh presentations and posters from Welsh delegates.




**Conclusion**

*Zostera marina* in the British Isles are at risk from poor water quality estuaries are of particular concern, islands are a refugia for seagrass

One major threat are raw sewage spills

Quantification of nutrients and stable isotopes in seagrass leaves can be used as a quick and reliable assessment of potential nutrient pressures

At leaf nitrogen concentrations > 3% seagrass meadows are at risk from excess nitrogen



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**AP124**

**UNVEILING THE CARBON STOCK POTENTIAL OF PORTHINILLAEN SEAGRASS MEADOW**

Samuel Thom

**1. Background**

Seagrass meadows are important ecosystems, providing habitat for many species and acting as carbon sinks. However, they are declining globally due to human activities such as coastal development and pollution.

**2. Research Aim**

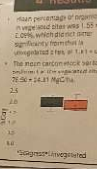
The aim of this research was to quantify the carbon stock potential of Porthinillaen seagrass meadows and to compare this to other seagrass species.

**3. Methods**

The research was conducted using a combination of field and laboratory methods. Seagrass samples were collected from the Porthinillaen meadow and analysed for carbon content in the laboratory.

**4. Results**

The results of the research show that the carbon stock potential of Porthinillaen seagrass meadows is significantly higher than other seagrass species. The mean percentage of organic carbon in seagrass leaves was 1.25 ± 0.20%, which is significantly higher than other seagrass species (mean = 0.8 ± 0.1%).



Species	Mean percentage of organic carbon
Porthinillaen	1.25 ± 0.20%
Other species	0.8 ± 0.1%

**5. Conclusions**

The research has shown that Porthinillaen seagrass meadows have a high carbon stock potential, which makes them an important part of the coastal ecosystem. This information can be used to help protect and restore seagrass meadows.

**6. References**

Thom, S. (2023). Unveiling the Carbon Stock Potential of Porthinillaen Seagrass Meadows. *Journal of Seagrass Research*, 1(1), 1-10.

# MICROPLASTIC IN TROPICAL ESTUARINE SEAGRASS MEADOWS: DOES SEAGRASS SIZE MATTER?

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### INTRODUCTION


- Seagrass meadows have been appointed as efficient microplastic (MP) trapping hotspots.
- MPS accumulation in the seagrass sediments from the Tropical Atlantic biogeography, such as those found in South America, have not been investigated yet.
- Also, small-bodied seagrass species are much less studied than large ones on their capacity to retain MPs.


### OBJECTIVE

Research sedimentary MP retention in areas vegetated by small-bodied seagrass species: *Halodule wrightii* (HW), *Halophila decipiens* (HD), and *H. bailonii* (HB) and an adjacent unvegetated (UN) area in a tropical estuary in the Brazilian coast, according to seasonality.

### METHODS

**Study area**  


**Meadow and Sediment**  


**Microplastic**  



Sampling was carried out in a multispecific seagrass meadow and an adjacent unvegetated area during the dry and rainy seasons.

### Analysis

1. Characterization
  - Seagrass meadow
  - Sediment
2. Microplastic
  - Extraction (NaCl / NaOH)
  - Visual identification
3. Literature review
  - All types of documents
  - Web of Science

### RESULTS

#### 1 MEADOW CHARACTERIZATION



- Biomass, shoot density and canopy height did not vary between seasons.
- Sediment between sand and fine sand.

#### 2 ABUNDANCE

- Sediment samples (N = 60)
- A total of 27 MP particles

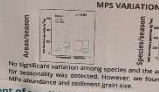
Total = 142 ± 140 particles/m<sup>2</sup>  
 Vegetated = 144 ± 140 particles/m<sup>2</sup>  
 Unvegetated = 106 ± 117 particles/m<sup>2</sup>

MP Fiber: 25.7%  
 25.7% Fib: 25.7%  
 25.7% Fib: 25.7%

#### 3 CHARACTERIZATION

- Fibers (27%)
- Blue (51%)
- < 1 mm (80%)

#### MPS VARIATION




No significant variation among species and the adjacent unvegetated area, neither for seasonality was observed. However, we found a positive correlation between MP abundance and sediment grain size.


#### Microplastic retention in the sediment of small-bodied tropical seagrass meadows

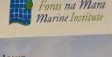
Unvegetated | *Halodule wrightii* | *Halophila decipiens* | *Halophila bailonii*

### CONCLUSION

- This study presents the first assessments of MP contamination in herbaceous meadows of the Southwestern Tropical Atlantic biogeography.
- There was no difference in the abundance of MP between vegetated and unvegetated areas.
- Seasonal or spatial variation in the abundance of MP was observed in the three studied seagrass species.
- Unvegetated areas may be important for MP accumulation in herbaceous meadows. This study provides a better assessment of seagrass species with potential for MP retention, as well as the influence of environmental factors on retention.







## Quantifying the blue carbon potential of Ireland's seagrass meadows along environmental gradients at a local scale


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### Introduction

Seagrass meadows are important carbon sinks that store carbon in biomass and sediments. They provide habitat, nutrient cycling, and erosion control. They are also important for blue carbon storage. This study aims to quantify the blue carbon potential of Ireland's seagrass meadows along environmental gradients at a local scale.

### Study Location

Local Study - Kiloran Bay



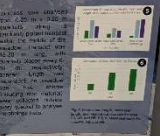
### Work Hypothesis

The hypothesis that there is a positive relationship between the amount of blue carbon stored in seagrass meadows and sediment carbon, and that this relationship is stronger in vegetated areas.


### Methods

Seagrass meadows were sampled along environmental gradients. Sediment samples were collected and analyzed for carbon content. Seagrass biomass was also measured.

### Results



### Local Scale



### Conclusions

The quantification of blue carbon potential in seagrass meadows is a complex task. This study provides a better understanding of the blue carbon potential of Ireland's seagrass meadows along environmental gradients at a local scale.

## **The importance of seagrass and understanding its contribution to climate change**

Seagrasses have a significant global role in supporting food security, mitigating climate change, enriching biodiversity, purifying water, protecting coastlines and controlling diseases. In May 2022, the General Assembly of the United Nations proclaimed 1 March as World Seagrass Day.

Seagrass has been shown to be 40% more efficient at carbon capture than trees and accounts for 20% of carbon sinking. The UK has lost 92% of its seagrass meadows since the Second World War which has largely been due to dredging and poor water quality. Loss of seagrass meadows also results in a loss of biodiversity, because not only does seagrass provide shelter for marine life but it also reduces noise pollution by acting as an underwater dampener which improves the quality of the area for animal reproduction. I believe that it is imperative that we do everything possible from a policy point of view to learn about seagrass and how best to help restoration.

At the conference, I learnt more about seagrass in a Welsh/UK context. Firstly, there is only one seagrass species found in Wales, *Zostera Marina*, and because of this, there is no genetic diversity among the seagrass colonies in Wales. This means that if seagrass is destroyed due to environmental factors another species will not simply repopulate the available habitat. Investigations are underway to see if it is possible to genetically modify seagrass genomes so that they can become more thermal resistant and greater adaptability to pathogens.

I also learned that the UK water has 75% higher nitrogen content than the global average and this is contributing significantly to stopping seagrass meadows from flourishing.

Of particular note were presentations given regarding Seagrass restoration in the coastal waters around Virginia in the USA, which has been a global success story through the work of scientists from the Virginia Institute of Marine Science (VIMS) who found a small patch of eelgrass and figured out how to restore it in this system. There was also discussion around The University of Virginia's Long Term Ecological Research program which has developed a methodology that is being used to quantify the amount of carbon that is being sequestered in seagrass beds. This has great potential in allowing seagrass to qualify for carbon credits which will generate considerable income for further restoration.

There were notable presentations of much interest around how seagrasses trap microplastics and the development of restoration techniques in UK waters.

### **Further work**

The information I learnt from attending this conference certainly informs my contributions to policy and to questions to the Cabinet secretary regarding the marine environment, especially since seagrass restoration is part of the Welsh Government's forward work programme.

Since this conference, I have arranged for follow-up meetings with people I have met at the conference to discuss what legislative changes are needed to help seagrass restoration in Wales. I have also expanded this work to now include seaweed and the potential for seaweed farming in Wales.