

# Developing the First National Blue Carbon Inventory for the Isle of Man

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## BLUE CARBON: A CLIMATE SOLUTION

Seagrass meadows, saltmarshes and shelf-sea muddy sediments can be long-term sinks for organic carbon (OC).<sup>1</sup> These “blue carbon” habitats could be managed to help offset *unavoidable* greenhouse gas emissions and contribute to nations’ Net Zero ambitions.

## IMPACT

The Isle of Man Government is developing a comprehensive blue carbon management plan to protect and maximise natural carbon sequestration, which could help mitigate the effects of climate change.

## AIMS

To inform the blue carbon management plan, our study quantifies:  
 1. the distribution and extent of seagrass meadows, saltmarshes and shelf-sea sediments around the Isle of Man;  
 2. the carbon stored and sequestered by these habitats.

## METHODS

Fieldwork took place around the Isle of Man from April to September 2022 and August 2023. Sediment cores were collected from seagrass meadows, saltmarshes, and shelf-sea sediments to assess stored organic carbon. Remote sensing was used to assess seagrass meadow extent.

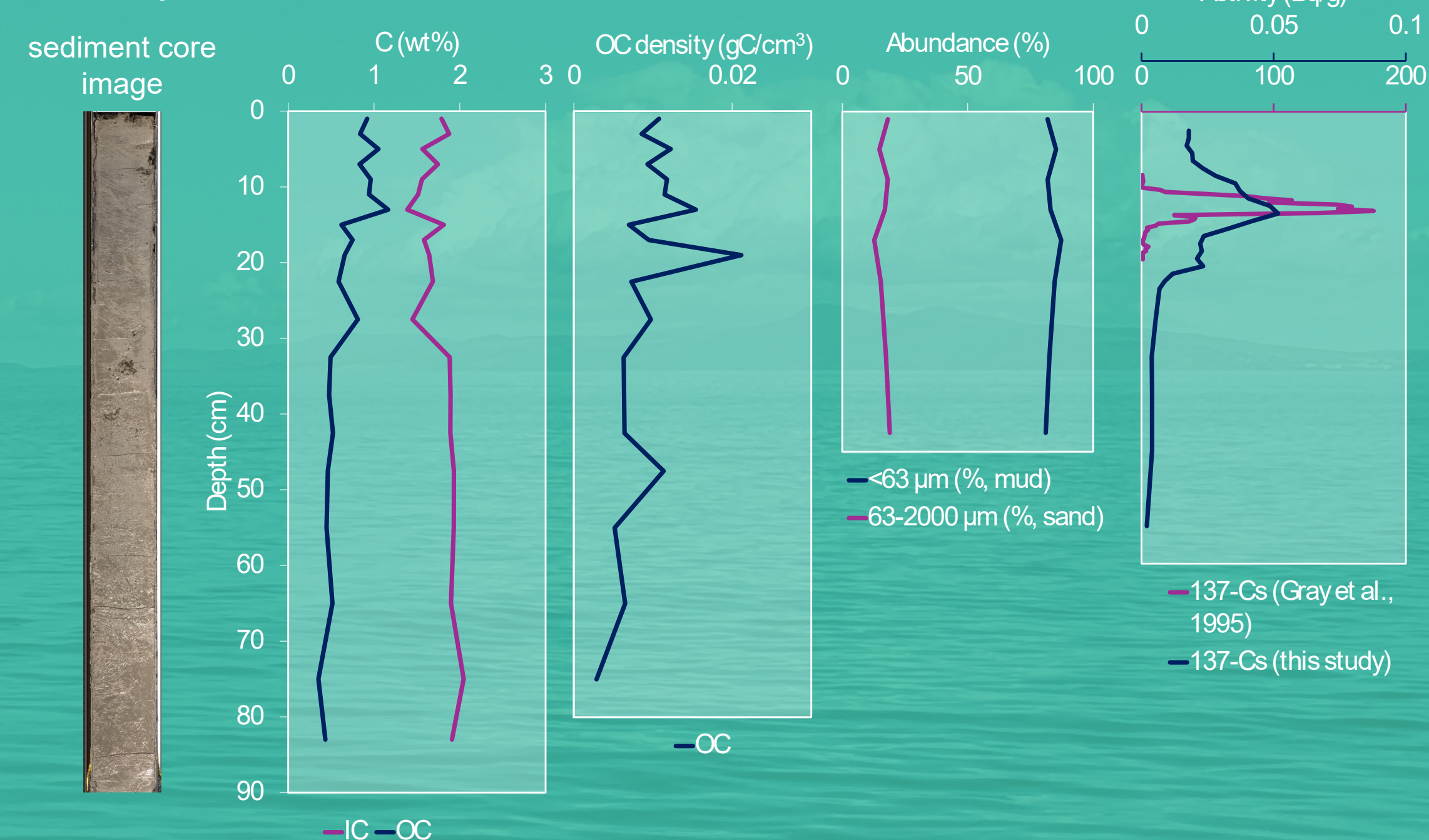
## OFFSHORE MUD

Location: 6–12 nm offshore (west)  
 Water depth: 60–120 meters

Materials and methods:  
 Gravity corer (ø90 mm) x20 cores  
 EA-IRMS,  $\gamma$ - $\alpha$ -spectrometry, particle size analysis

Results:  
 Sediment type: mud (<63  $\mu$ m = >85%)  
 Total area: 49212.3 ha  
 OC storage, top 10 cm: 10.05 MgC/ha  
 OC stock, top 10 cm: 494609.47 MgC  
 OC accumulation: 20.40–49.88 gC/m<sup>2</sup>/yr

Example data:



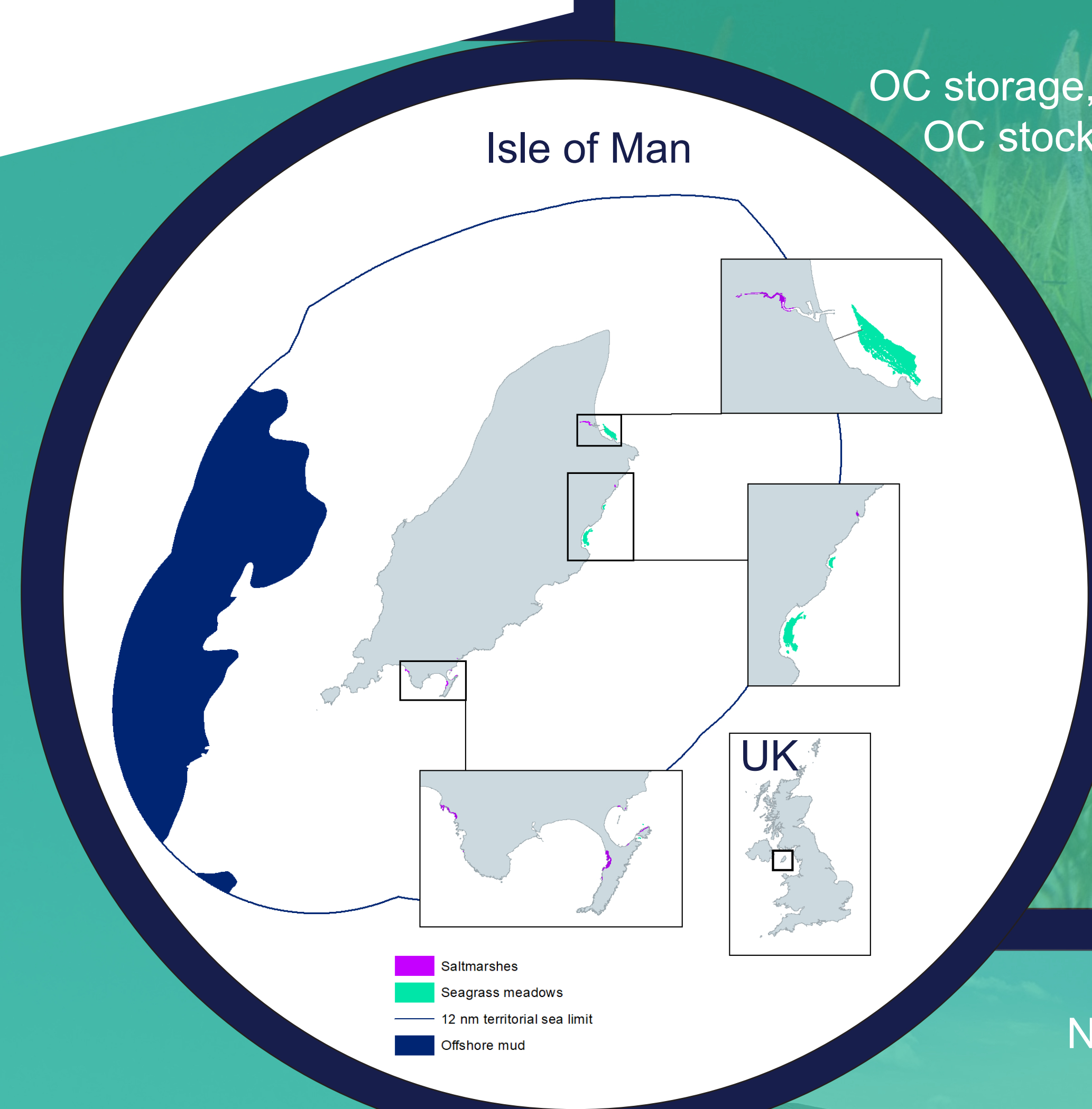
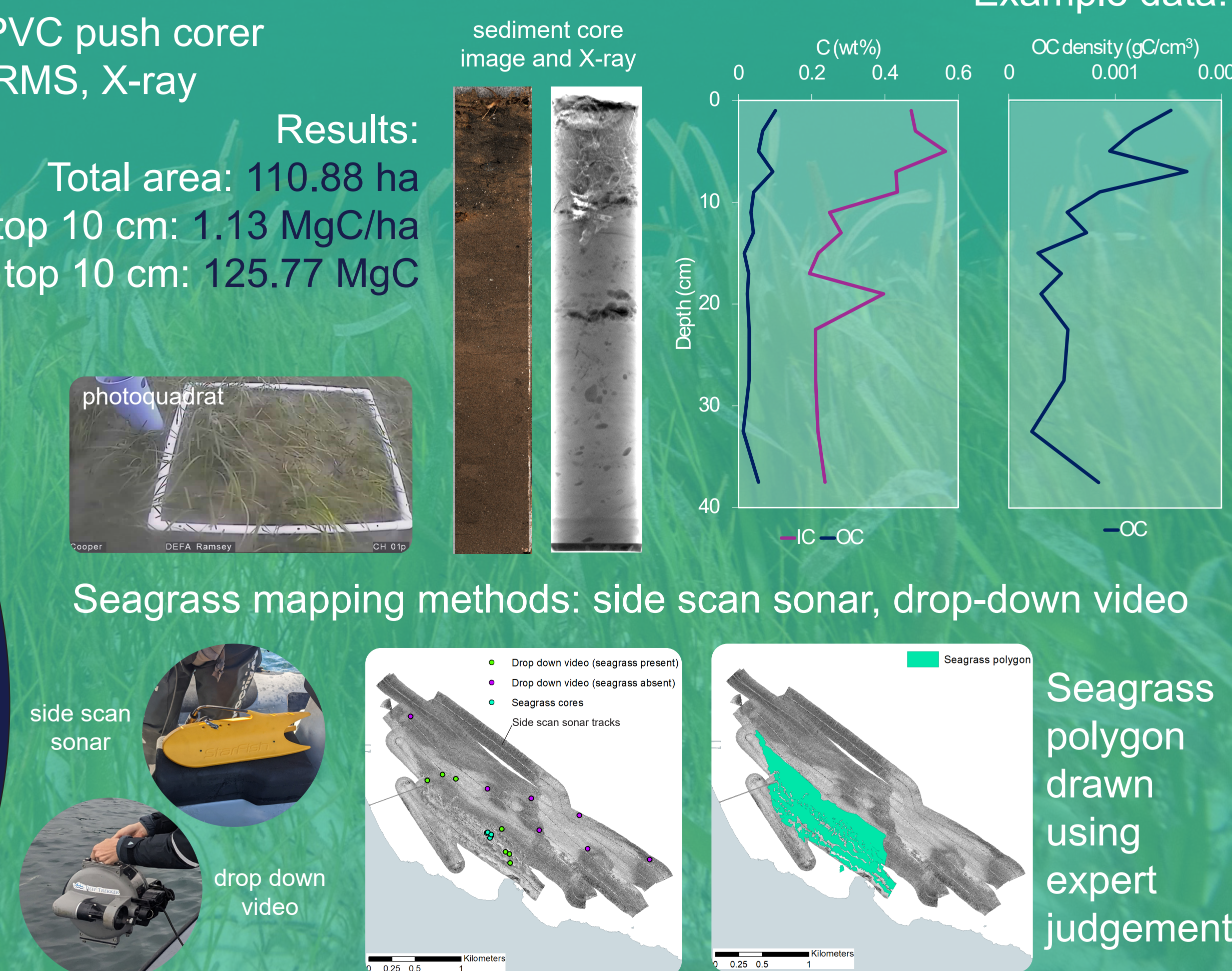
Number of sites: 4; Species: *Zostera marina*;  
 Water depth: 5–12 meters

Materials and methods: PVC push corer (ø90 mm) x5 cores; EA-IRMS, X-ray

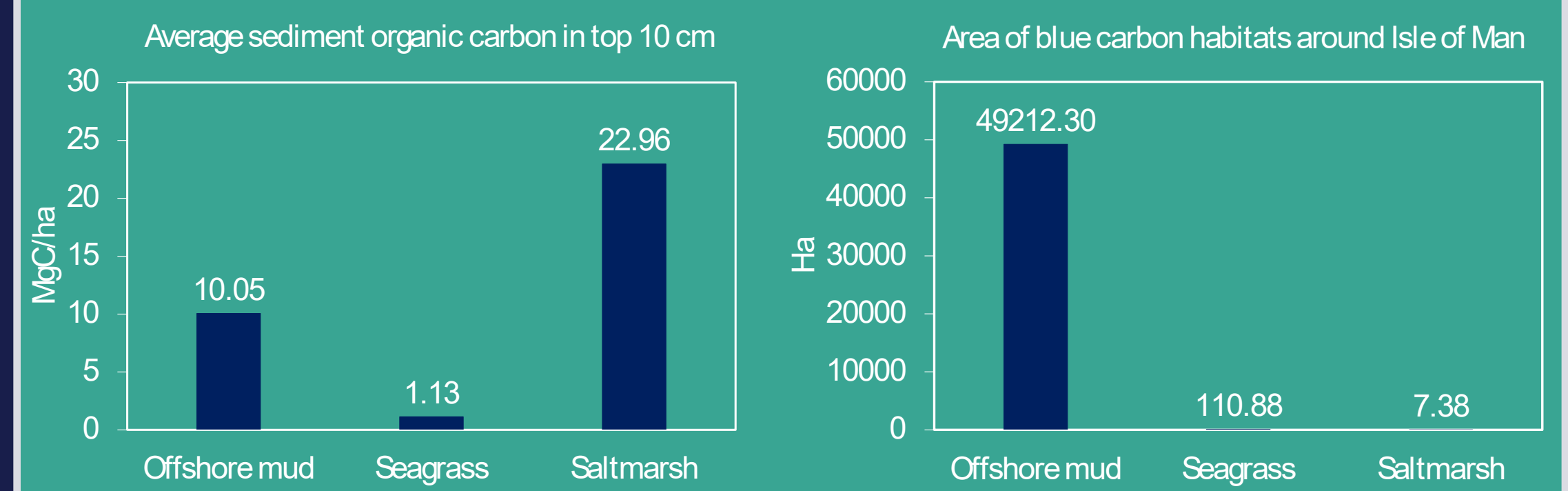
Results:  
 Total area: 110.88 ha  
 OC storage, top 10 cm: 1.13 MgC/ha  
 OC stock, top 10 cm: 125.77 MgC

## SEAGRASS MEADOWS

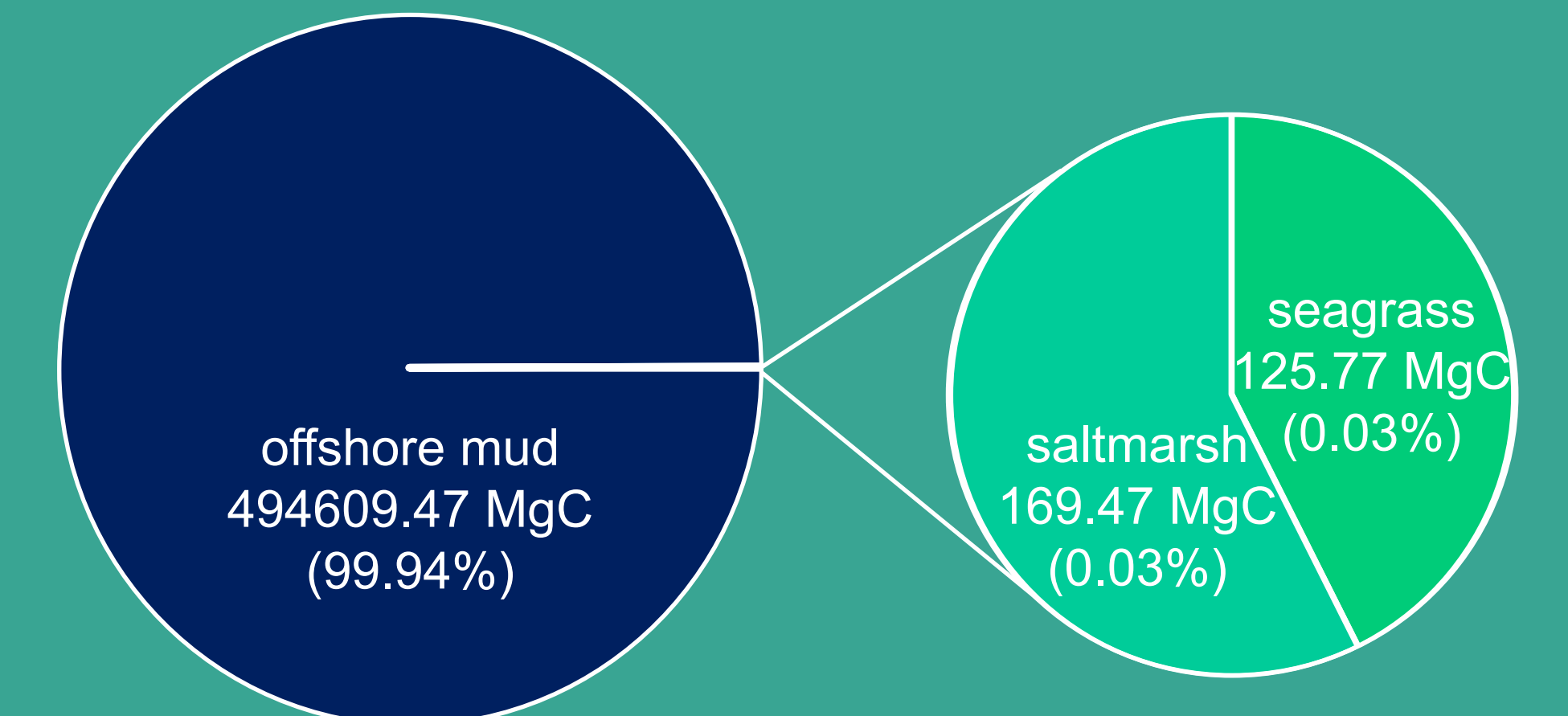
Example data:



## WHERE IS THE BLUE CARBON?



OC stocks:



Number of sites: 4

Materials and methods:  
 PVC push corer (ø110 mm) x5 cores  
 EA-IRMS, X-ray

Results:  
 Total area: 7.38 ha  
 OC storage, top 10 cm: 22.96 MgC/ha  
 OC stock, top 10 cm: 169.47 MgC

## SALTMARSHES

Example data:



## CONCLUSIONS

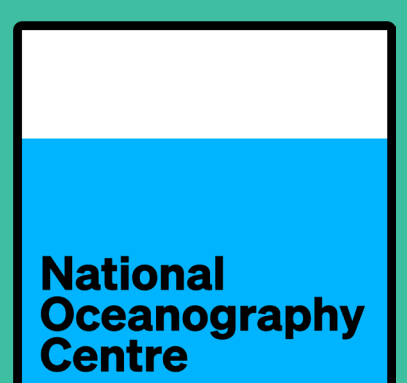
- The most significant blue carbon stock is in offshore muddy sediments, due to the vast area covered.
- The densest blue carbon stock is in saltmarsh sediments, in agreement with literature.<sup>3</sup>
- The lowest blue carbon storage capacity and stock is in seagrass meadows, which agrees with low carbon found in other temperate seagrass meadows.<sup>4</sup>
- These data can be used to prioritise areas for blue carbon management.

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References:  
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