

MASTS Small Grants (SG425) – Final Report

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The MASTS Small Grant award facilitated an investigation into the current sedimentary carbon stock of the Eden Estuary through the purchase of a Vibecore-Mini handheld coring unit with 3 inch diameter 1 meter core tubes.

Vegetated intertidal habitats, such as saltmarshes, can offer a range of ecosystem services. Saltmarshes are known to be sites of extensive carbon sequestration and storage, providing climate change mitigation benefits. This ecosystem service provision is partially due to the potential for deep, organic rich, anoxic sediments to accumulate over time. This trend of deposition and retention can continue indefinitely whilst the marsh is in equilibrium with local sediment load and dominant hydrology. The restoration of saltmarsh areas has been increasingly carried out to mitigate historical losses in extent. In the Eden Estuary this restoration has taken place through the transplantation of Sea Club Rush from donor marsh stands onto upper mudflats, encouraging the growth of new swards of vegetation.



Figure 1. Left image showing series of core tubes and vibecore-mini head unit in the field ready for collection of sediment cores; Right image showing sediment core removed from core tube.

Restoration efforts, if successful, will result in an altered state of dynamics at the specific site, encouraging the development of typical saltmarsh characteristics, namely sediment accretion. The degree of this change and its impact on carbon burial was assessed using the Vibecore-Mini unit to retrieve sediment cores down to refusal depth, in this case maximum penetration was approximately 70 centimetres. The benefit of using this corer are that it facilitates progression through the sediment with reduced risk of compaction, due to the lack of repeated impacts associated with traditional push coring. Furthermore, the core unit produces suction within the tube,

through a one-way valve at the head, acting to maximise the retrieval of an intact sediment core. These samples were subsequently used to generate depth profiles of organic content, bulk density and carbon content; informing on the sedimentary storage potential of each area, illustrating any additionality offered by restoration (see figure 2 for some preliminary data).

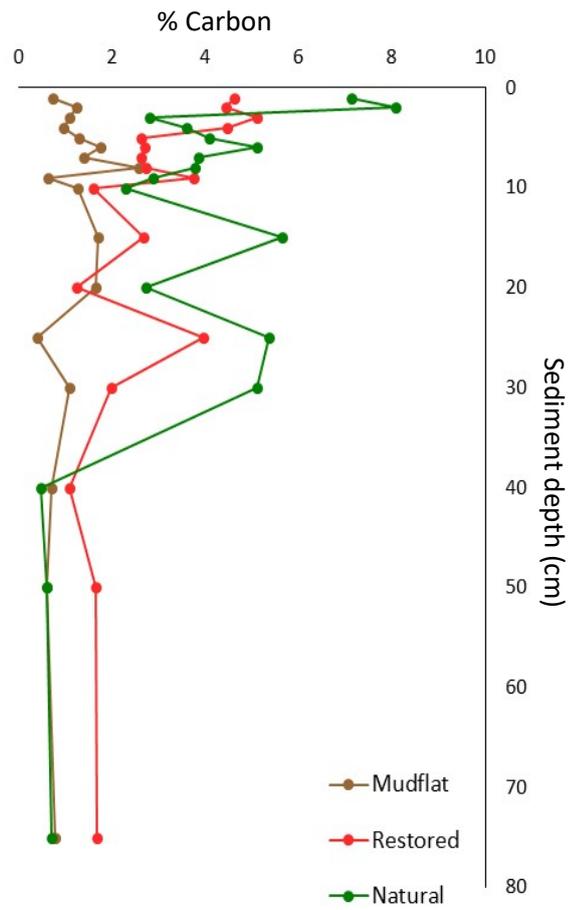


Figure 2. Percentage carbon content profiles: natural marsh (green); restored area (red) and mudflat (brown).