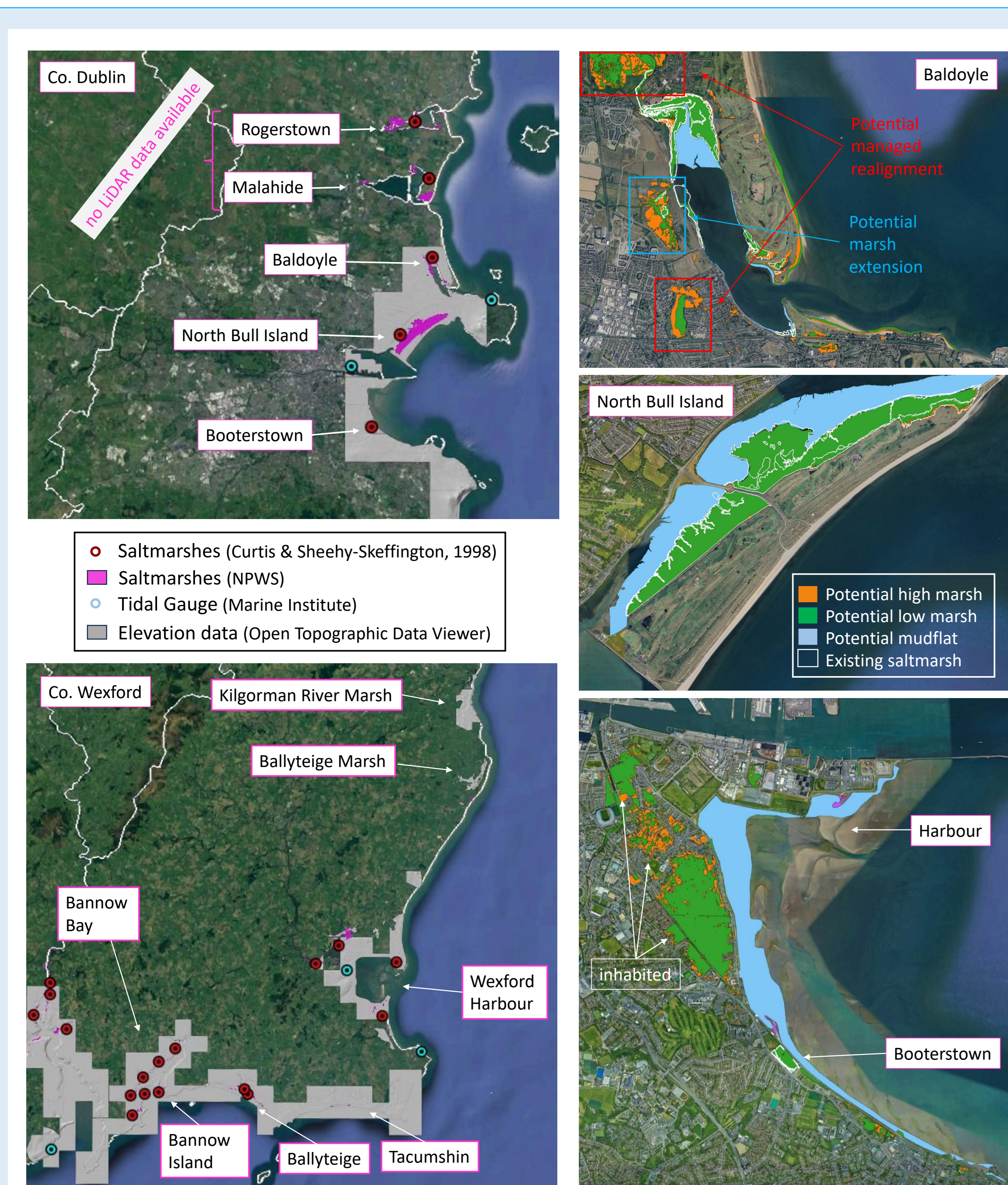


Background:

Saltmarshes protect the coast against storm surges and erosion, are important ecosystems for breeding and sheltering birds and fishes, and sequester large amounts of carbon dioxide in their soils. The carbon sequestration potential of saltmarshes has the power to alleviate the government's commitment to reduce national greenhouse gas emissions. Ireland has approx. 250 vegetated saltmarsh sites, encompassing 6,500 ha and a carbon stock of 950,000 Mg C_{org} (Burke et al., *in prep.*).

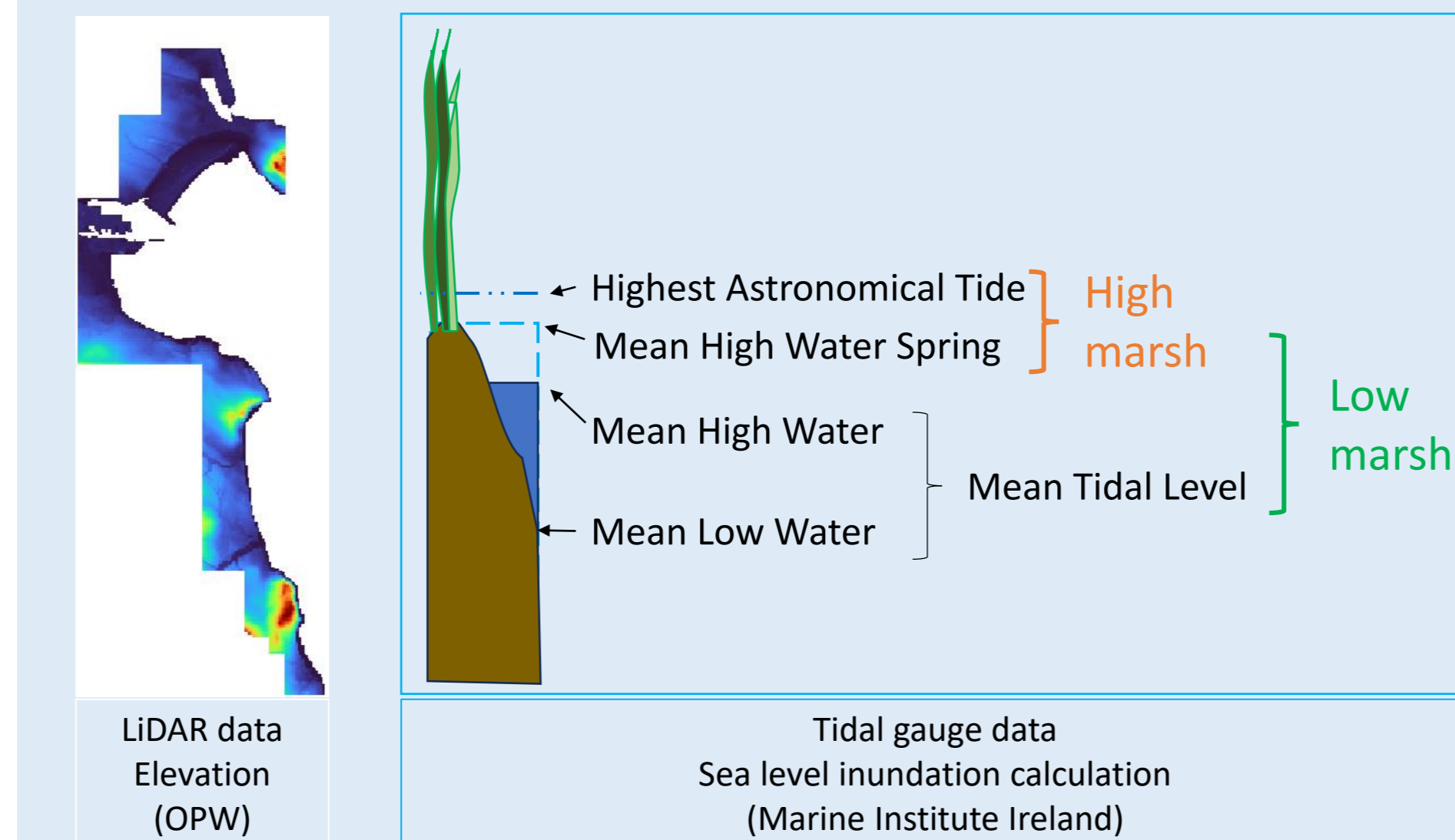
Aim: Estimate the potential to increase the number and area of saltmarshes in Ireland

We studied the elevation and tidal inundation along the coastline and calculated the area that could potentially be transformed into saltmarsh: 1) Existing saltmarshes, 2) areas that may naturally extend from existing saltmarshes due to natural plant colonization of adjacent mudflats (= **potential**), and 3) areas where barriers and impoundments need to be breached in managed realignment projects (= **MR**).

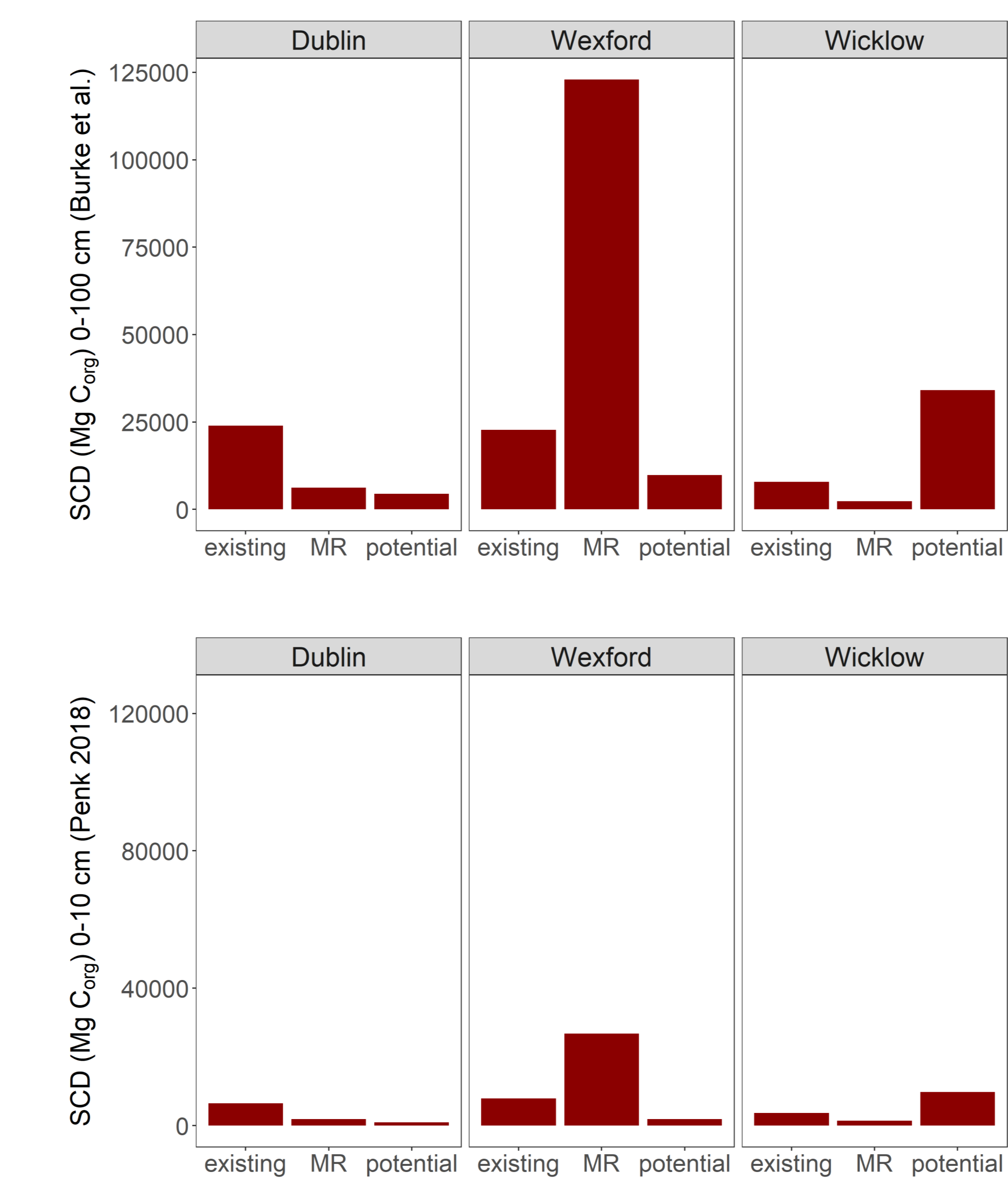


Methods Managed Realignment:

The areas of current saltmarshes are identified based on openly available GIS data (NPWS). The potential natural development and expansion of existing saltmarshes is analysed using water level data from marine tidal gauges and topographic elevation data of the adjacent terrestrial areas.



Results:



Saltmarsh areas

- 553 ha (existing)
- 497 ha (natural expansion)
- 1,188 ha (managed realignment)

Soil carbon stocks

- Existing:
- 54,523 Mg C_{org} in 0-100 cm

- Natural expansion:
- 48,303 Mg C_{org} in 0-100 cm
 - 11,343 Mg C_{org} in 0-10 cm

- Managed Realignment:
- 144,039 Mg C_{org} in 100 cm
 - 30,084 Mg C_{org} in 10 cm

414 ha of potential saltmarsh in Dublin and Wexford are inhabited and not fit for saltmarsh development.

Avoided CO₂ emissions

- Natural expansion:
- 177,112 Mg CO₂ (100 cm)
 - 41,590 Mg CO₂ (10 cm)

- Managed Realignment:
- 528,142 Mg CO₂ (100 cm)
 - 110,307 Mg CO₂ (10 cm)

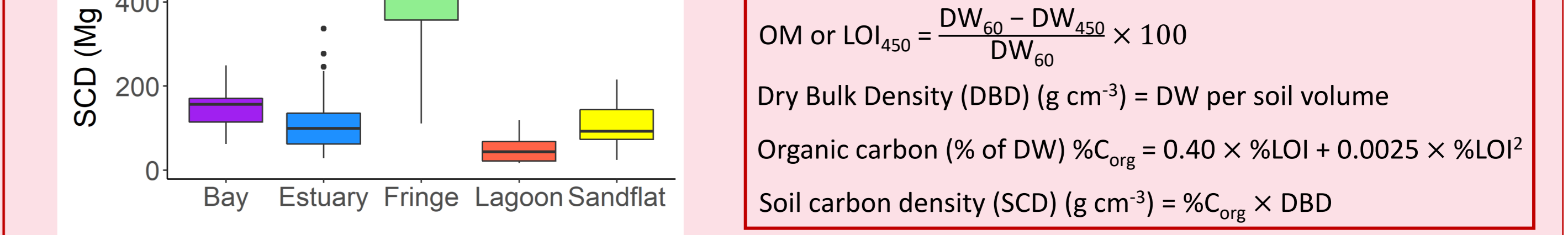
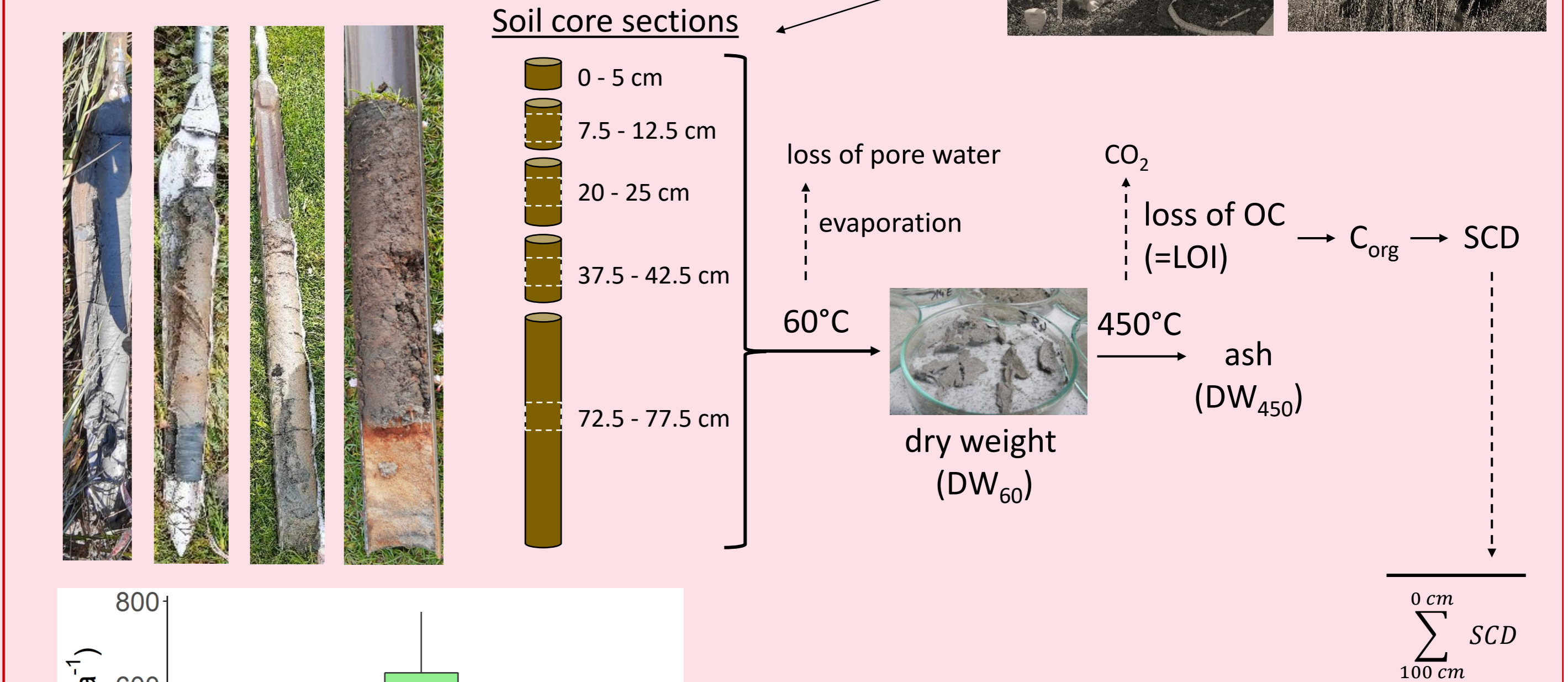
Current saltmarsh total in Ireland:

- 6,651 ha saltmarsh
- ~950,000 Mg C_{org} (soil + plants)
- ~2.84 Mt CO₂ avoided
- =5.7% of Ireland's total CO₂eq

57% of saltmarshes in Ireland can not be analysed due to lack of LiDAR data

Methods Carbon Stocks:

Burke S et al. „Magnitude and variability of organic carbon stocks in temperate northeast Atlantic saltmarshes“. *In prep.*



Penk MR (2018) „Preliminary carbon stocks of Irish saltmarshes (2018-CCRP-SS.25)“. EPA Research Report

- 1310: *Salicornia* agg.
- 1320: *Spartina* swards
- 1330: Atlantic salt meadows
- 1410: Mediterranean salt meadows

Take-home message:
Managed realignment could increase existing saltmarsh areas by up to 20% - 500% per county
20% of saltmarsh increase would offset approx. 0.5 Mt CO₂