Project	Physical and geochemical properties of Scottish saltmarsh soils.
Funding	USA/015/20
Staff Responsible	William Austin
Research Team	1. Lucy C. Miller *(University of St Andrews)* 2. Craig Smeaton *(University of St Andrews)* 3. William E.N. Austin *(University of St Andrews/Scottish Association of Marine Science)*

Metadata Type	**Details**
Data Resource ID	Physical and geochemical properties of soil samples from 18 wide diameter gouge cores spanning seven Scottish saltmarshes.
Description of dataset	Physical and geochemical measurements produced from 18 wide diameter gouge cores (60 mm in diameter) collected from seven Scottish saltmarshes used to calculate organic carbon accumulation rates across Scotland's saltmarsh ecosystem.
Locations of the observations	Scotland Geographic Extent: 54.251069, -6.262840 54.564402, 0.464285 58.742170, -0.204728 58.994955, -7.092833 Site locations presented as decimal longitude and latitude (WGS84), and as X easting and Y northing in the data resource.
Location Descriptions	All sites are located in similar environmental regions of Scotland to allow for comparable data. Furthermore, the sites were chosen from around the Scotland coastline to provide an accurate representation of saltmarshes, sediment types, and organic carbon content within Scotland.
Names of the variables or parameters observed or simulated	Wet bulk density (g cm^{-3}) Dry bulk density (g cm^{-3}) Organic carbon content (%) Nitrogen Content (%) Stable Isotopes - $\delta^{13}C_{org}$ (‰) ; $\delta^{15}N$ (‰) Carbon/Nitrogen ratio Nitrogen/Carbon ratio

All procedures used to make observations or simulations (field/lab where applicable)	**Sampling:** Eighteen wide diameter gouge cores were collected from seven Scottish saltmarshes. Samples were collected using a 5cm gouge corer. Core descriptions were taken during sample collection. DGPS was used to record the location of the sample sites. Samples were frozen at -20^{o}C until analysis. **Sample preparation:** Core descriptions were taken du following the Troels-Smith classification scheme (Troels-Smith, 1955). The sediment cores were cut into 1cm sections (n=*739*). The sediment samples were weighed prior and post drying at 60^{o}C for 72 hours to allow for bulk density (g cm^{-3}) to be calculated (Dadey *et al.,* 1992). **Carbon quantification:** The samples were milled into a fine powder. 50mg of the sample were added to a crucible. The samples were analysed using a Elementar Soli TOC using the temperature gradient method (DIN 19539, Natali et al., 2020; Smeaton *et al., 2021*) of elemental analysis to quantify OC. **Stable isotope analysis:** To determine the bulk elemental (OC and N) and stable isotope ($\delta^{13}C_{org}$ and $\delta^{15}N$) composition approximately 12 mg of processed sediment was placed into tin capsules and sealed; a further 12 mg was placed into silver capsules. The samples encapsulated in silver underwent acid fumigation (Harris *et al., 2001*) to remove carbonate ($CaCO_3$) and were dried for 24 h at 40 °C. The stable isotope analyses were undertaken at James Hutton Institute using an elemental analyser coupled to an isotope ratio mass spectrometer (EA-IRMS). The acidified samples were analysed for OC and $\delta^{13}C_{org}$, while nitrogen (N) and $\delta^{15}N$ values were produced from the tin encapsulated samples.
Calibration procedures, where applicable	The Soli TOC was calibrated using Calcium Carbonate ($CaCO_3$) and Silty soil TOC/ROC/TIC standards (B2290). Isotopic values were quality controlled through the repeat analysis of high OC sediment standard (B2151) with reference values for C and N.
Statistical treatment of the observations or simulations	NA
Data checking procedures (quality control)	All laboratory equipment were calibrated in accordance with the laboratory practises at the University of St Andrews.
File formats used	.csv

Other information	NA indicates no data in cells.
References	Dadey, K.A., Janecek, T. and Klaus, A., 1992. Dry-bulk density: its use and determination. In Proceedings of the Ocean Drilling Program, Scientific Results (Vol. 126, pp. 551-554). College Station, TX, USA: National Science Foundation, & Joint Oceanographic Institutions Incorporated. DIN 19539: 2015-08, Investigation of solids Temperature dependent differentiation of Total Carbon (TOC400, ROC, TIC900). Harris, D., Horwáth, W.R. and Van Kessel, C., 2001. Acid fumigation of soils to remove carbonates prior to total organic carbon or carbon-13 isotopic analysis. Soil Science Society of America Journal, 65(6), pp.1853-1856. Natali, C., Bianchini, G., & Carlino, P. (2020). Thermal stability of soil carbon pools: Inferences on soil nature and evolution. Thermochimica Acta, 683, 178478. Smeaton, C., Hunt, C.A., Turrell, W.R. and Austin, W.E., 2021a. Marine Sedimentary Carbon Stocks of the United Kingdom's Exclusive Economic Zone. Frontiers in Earth Science, 9, p.50. Troels-Smith, J., 1955. Characterization of unconsolidated sediments. Reitzels Forlag.

Data resource description for Physical_geochemical_properties_narrow_wide.csv		
Header	**Description**	**Cell Format**
Core_ID	Core identification	Text
Marsh_ID	Saltmarsh name	Text
Sampling_year	Year of sample collection	Number
Local_authority	Local authority responsible for the saltmarsh	Text
Marsh_type	Estuarine	Text
	Embayment	
	Back-barrier	
	Fringing	
Marsh_zone	Low-Mid	Text
	High	
Sample_depth_cm	Depth interval of sub-sample (cm)	Number
Mid_Point_depth_cm	Depth interval mid-point (cm)	Number
Lat_dec_deg	Latitude reported in decimal degrees using the WGS84 projection	Number
Long_dec_deg	Longitude reported in decimal degrees using the WGS84 projection	Number
X_easting	Location reported as X (Easting)	Number
Y_northing	Location reported as Y (Northing)	Number
Wet_bulk_density_g_cm_3	Wet bulk density (g cm^{-3})	Number
Dry_bulk_density_g_cm_3	Dry bulk density (g cm^{-3})	Number
OC_perc	Organic carbon content (% wt.)	Number
delta_13Corg_per_mil	$\delta^{13}C_{org}$ stable isotope value (‰)	Number
N_perc	Nitrogen carbon content (% wt.)	Number
delta_15N_per_mil	$\delta^{15}N$ stable isotope value (‰)	Number
CN	Carbon/Nitrogen ratio (Atomic)	Number
NC	Nitrogen/Carbon ratio (Atomic)	Number