

The role of differences in the former land use on the 3D structure of restored saltmarsh sediments

Jonathan Dale¹, Andrew Cundy¹, Heidi Burgess¹, Kate Spencer² and Lucy Diggins²

¹ University of Brighton, School of Environment and Technology, Cockcroft Building, Lewes Road, BN2 4GJ Brighton, United Kingdom
E-mail: J.Dale2@brighton.ac.uk

² Queen Mary University of London

Evidence suggests that saltmarshes in managed realignment sites differ in structure and function to adjacent natural sites. Previous studies have associated these differences with the sub-surface sediment structure influencing the porosity and hydraulic conductivity of the restored sites, possibly due to compaction caused by the former land use (Tempest *et al.*, 2015). However, further evidence is required assess the extent to which the former land use influences the evolution of other saltmarsh restoration schemes.

To investigate the role that different former land uses have on the sediment structure we present innovative 3D analysis of sediment cores from the Medmerry Managed Realignment site, UK, the largest open coastal realignment site in Europe. Core samples were taken in July 2015 from a former barley field, farmed intensively up to two weeks before site inundation in September 2013, and a field used irregularly for low-quality arable purposes. Each core was scanned using an x-ray computed microtomography system and comparisons between the two sites have been contextualised by supporting data from the wider on-going monitoring of the Medmerry site.

Visual comparisons of the sediment structure demonstrated a lower abundance and tortuosity of macropores and clear laminations in the upper sediment in the field farmed intensively. It is proposed that former land use can have a long-term effect on evolution of the sediment regime, which in turn can have major implications for ecosystem services such as coastal flood defence, immobilisation of pollutants and species diversity provided by the Medmerry site. This poster provides new insight into the influence of the former land use with implications for the success of future restoration projects.

Reference

Tempest, J. A., Harvey, G. L. & Spencer, K. L. 2015. Modified sediments and subsurface hydrology in natural and recreated salt marshes and implications for delivery of ecosystem services. *Hydrological Processes*, 29, 2346-2357.