

Spatial and temporal variations of *in situ* erosion shear strength of newly inundated inter-tidal sediment

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Modelling the evolution of intertidal cohesive sediment systems requires accurate estimates of the near bed sediment dynamics including the rate of surface erosion and erosion thresholds (Grabowski *et al.*, 2010). The surface shear strength of cohesive sediment has been recognised to vary both spatially and temporally (e.g. Black *et al.*, 2002; Tolhurst *et al.*, 2006) in response to the physical, chemical and biological properties of the sediment (Winterwerp and van Kesteren, 2004; Grabowski *et al.*, 2011). Ongoing research is increasing the understanding of intertidal biogeochemical sediment properties (e.g. Paterson, 1989; Grabowski *et al.*, 2011), however relatively little is understood about the changes in surface sediment properties when terrestrial land is inundated by the sea, as occurs at managed realignment sites.

Situated on the south coast of England, the Medmerry Managed Realignment site (breached September 2013) is the largest (183 hectares) open coast realignment project in Europe. Regular *in-situ* measurements of sediment surface shear strength were taken using a Cohesive Strength Meter (Paterson, 1989; Tolhurst *et al.*, 1999). Correlated with the variation in geochemical and physical conditions at each sample position, these results further the understanding of factors controlling sediment stability (e.g. Winterwerp and van Kesteren, 2004; Grabowski *et al.*, 2011).

This paper provides an insight into the temporal and spatial variability of cohesive sediment properties in open coastal managed realignment sites, where fluvial influence is limited. As a result there will be improved understanding of the dynamics of sediment with implications for the management and design of anthropogenically created intertidal environments.

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