

TECHNOLOGICAL ADVANCES IN SALTMARSH RESTORATION

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Abstract

Brightlingsea Harbour is situated on the Colne Estuary in Essex, UK. This historic port dates to the 15th century with its Cinque designation and has played an active role during WW2. Today the harbour is a small mixed leisure and commercial port. However, due to its tidal nature and geomorphology, accumulation of marine sediment is an ongoing issue.

This sedimentation had a significant impact on the safe navigation and access to the harbour, especially for larger (>80m) cargo and wind turbine support vessels. This was significantly affecting the economic output of the harbour, having a detrimental knock on effect to the wider community.

To combat this issue, Brightlingsea Harbour commissioners (BHC) alongside Exo Environmental ltd, developed a dredging campaign which focused on Working with Nature and re-using dredged sediment.

As part of the USAR project, BHC dredged 35,000m³ of sediment from the navigational channels. Sediment was both mechanically dredged and hydraulically pumped to re-use sites throughout the harbour. These re-use sites were determined via historical analysis of RAF images dating back to 1947, to assess areas of greatest historical saltmarsh retreat and degradation.

The sediment was used to restore 3 ha of intertidal mudflat and saltmarsh habitat, forming a layer of substrate upon which pioneer halophytes can colonise, such as samphire. Saltmarsh flora traps sediment which increases the habitat elevation, providing a defence that adapts to sea level rise. Carbon sequestration ability of these habitats add further climate value. The absorptive qualities of regenerated saltmarsh also reduce erosive wave energy, decreasing costs associated with maintenance of 'grey' coastal defences and helping to form a circular economy of sustainability.

The USAR pilot in Brightlingsea proved that waste sediment is suitable for habitat restoration and demonstrated the feasibility of using sediment as a resource and utilizing nature in coastal management strategies.

Keywords: Brightlingsea Harbour Commissioners, Sediment, Saltmarsh, Circular Economy, Dredging.