Salt Marsh Dynamics – Field Observations

Aim: Estimate release / storage of sediment from the upper intertidal zone and associated changes to marsh topography and surface elevation (for validation and calibration of marsh evolution models).

Accretion monitoring

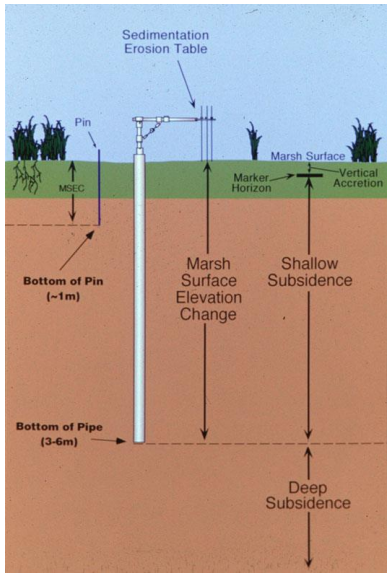
Sediment deposition is measured relative to kaolinite marker horizons deployed to the marsh surface in ca 30 x 30 cm patches. Recovery of marsh cores after several months/years provides estimates of marsh surface sediment deposition rates (accretion rates) in mm yr^{-1}. (photo: I Möller)

Surface elevation change

Surface elevation change is a function of sediment deposition, erosion, and compaction. The latter results from compression and is aided by decomposition of organic deposits over time.

Surface elevation change is recorded with a Sedimentation-Erosion-Table (SET). (see http://www.pwrc.usgs.gov/set). Vertical pins are lowered to the marsh surface and their height above a precision-engineered horizontal arm is recorded to provide mm yr^{-1} change.

Elevation change = net tidal deposition (accretion) - shallow subsidence (compaction)

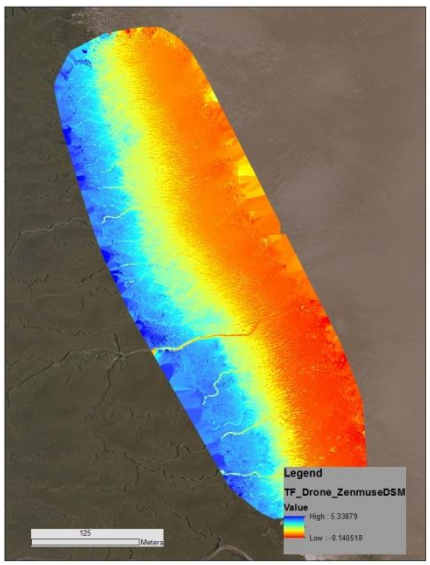


Coring

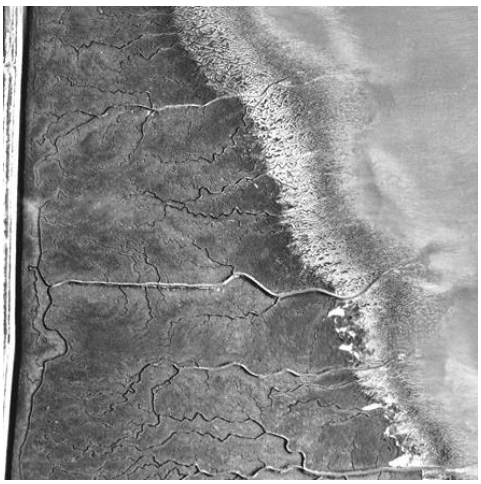
Sediment cores aid reconstruction of marsh dynamics over 10s of years.

Scaling Up: RTK DGPs surveying, UAVs, and Aerial Photography

Aboe: RTK DGPs used to survey cross-shore profiles (photo: H. Brooks)



Right: Digital terrain mapping from UAV depoloyment (CCRU)



Above: 1:5,000 Aerial Photograph of Tillingham, Dengie Peninsula, UK East coast (Environment Agency).

Winter/Summer ross-shore profiles (1991-present), UAV imagery, LiDAR, and Aerial Photography are available from a range of sources (e.g. UK Environment Agency).