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Soil carbon pools in temperate saltmarsh and mangrove environments

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Intertidal sediments sequester significant amounts of C globally. C sources can be categorised into organic C inputs from within the estuary (autochthonous) and inputs trapped within the estuary derived from external sources (allochthonous). SOC can be divided into three C pools, particulate organic carbon (POC), humus carbon (HC) and recalcitrant carbon (RC). Belowground organic carbon stocks in mangrove and saltmarsh environments have been quantified in a number of environments globally, identifying the potential to store substantial amounts of C. In this study, we quantified the SOC stocks in temperature saltmarsh and floodplain environments and identified the contribution from the three C pools.

We found that saltmarsh sites had a higher potential to accumulate SOC compared to mangrove areas, which was related to increasing distance from the creek network and higher elevations. The mangrove sites had a higher proportion which have be related to deposition of both allochthonous and autochthonous materials. The saltmarsh sites had higher potential for C sequestration due to higher proportions of HC. These results highlight the importance of protecting these environments, not only as they provide a transitional environment between the coastal and terrestrial zone, but also as important stores of more stable organic carbon.