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# Changes in soil organic carbon fractions following remediation of a degraded coastal floodplain wetland

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Coastal floodplain soils and wetland sediments can store large amounts of soil organic carbon (SOC). These environments are also commonly underlain by sulfidic sediments which can oxidise, largely due to drainage of floodplains to decrease water levels, to form coastal acid sulfate soils (CASS). Following oxidation, pH of both soil and water decrease, and acidity and mobilisation of trace metals increases to adversely affect vegetation and adjacent aquatic ecosystems. In extreme cases, vegetation death occurs resulting in the formation of scalds, which are large bare patches. Remediation of these degraded coastal soils generally involves neutralisation of acidity via application of lime and the re-introduction of anoxic conditions by raising water levels. Our understanding of the geochemical changes which occur as a result of remediation is relatively well established. However, SOC stocks and fractions have not been quantified in these coastal floodplain environments. We studied the changes in soil geochemistry and SOC stocks and fractions three years after remediation of a degraded and scalded coastal floodplain. Remediation treatments included raising water levels, and addition of either lime (LO) or lime and mulch (LM) relative to a control (C) site. We found SOC concentrations in the remediated sites (LO and LM) were more than double than that found at site C, reflected in the higher SOC stocks to a depth of 1.6 m. The particulate organic C fraction was higher at sites LO and LM due to increased vegetation and biomass inputs, compared to site C. Therefore, coastal floodplains and wetlands are a large store of SOC and can potentially increase SOC following remediation due to i) reduced decomposition rates with higher water levels and waterlogging, and ii) high C inputs due to rapid revegetation of scalded areas and high rates of biomass production.