

Seagrass loss causes rapid changes in sediment dynamics and macrofaunal communities, at Gazi Bay, Kenya

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The provision of ecosystem services by marine habitats is compromised by their degradation. This seagrass removal experiment study tested the impacts of seagrass loss on faunal diversity and ecosystem functioning at Gazi Bay, Kenya. Sediment Elevation Tables (SETs) and sediment traps were used to monitor surface elevation and accretion respectively, while surface sediment carbon concentration was determined after 18 months. Effect of seagrass removal on water velocity was investigated indirectly using Plaster of Paris cubes. Temporal trends in rate of litter decay at varying depths and treatments were monitored. Dropbox samples, cores, and visual counts of fauna mounds and burrows, were used to monitor the impact of seagrass removal on the epifaunal and infaunal communities (>0.5 mm). The mean (\pm 95% C.I) sediment elevation and erosion in the control and removal areas was 7.6 ± 0.4 and -15.8 ± 0.5 mm yr⁻¹ respectively with significant interaction effect of treatment and time on sediment elevation $F(17,102)=3.59$, $p < 0.01$. There was significant interaction effect of treatment and height on weight loss of plaster cubes $F(2, 12) = 6.102$, $p = .015$. Exponential litter decay rates were recorded. Removal of seagrass showed a dramatic and significant impact on both infauna and epifauna with a combined loss of 83.5% of faunal abundance and a loss of 42.7% of taxa compared with control plots. These findings demonstrate rapid changes in sediment dynamics and chemistry following seagrass removal, driven in part by significant alterations in the faunal community. Key words: Macrofaunal communities, seagrass degradation, surface elevation.