

ABSTRACT

Vidiawati 24020121130104. Estimation of Carbon Stock in Mangrove Sediments on Kemujan Island, Karimunjawa, Jepara. Di bawah bimbingan Fuad Muhammad dan Sri Widodo Agung Suedy.

Mangrove ecosystems play a crucial role in sediment carbon storage, thereby contributing to global climate change mitigation. However, information regarding the distribution of sediment carbon stocks across intertidal zones and soil depths in Kemujan Island, Karimunjawa, remains limited. This study aimed to estimate sediment carbon stocks within the mangrove ecosystems of Kemujan Island, Karimunjawa, Jepara. Sediment samples were purposively collected, and organic carbon content was determined using the Walkley–Black method, while total carbon stocks were calculated by integrating bulk density, carbon concentration, and sediment thickness. The results showed that sediment carbon stocks ranged from 84.58 to 332.22 t ha⁻¹, with an average of 173.57 t ha⁻¹. The middle zone exhibited the highest carbon stock (203.17 t ha⁻¹), while deeper sediment layers stored more stable carbon (192.97 t ha⁻¹) compared to surface layers (153.45 t ha⁻¹). Variability in sediment carbon stocks was influenced by differences in bulk density, organic matter content, anaerobic conditions within deeper layers, and the contribution of mangrove litter and root biomass. Overall, the mangrove ecosystems of Kemujan Island demonstrate a substantial capacity for sediment carbon storage, underscoring their importance in coastal conservation and climate change mitigation.

Keywords: *carbon stock, mangrove sediment, intertidal zonation, Kemujan Island*