RINGKASAN

EVELYN YESANIA TARIHORAN. Distribusi Vertikal Karbon Sedimen Berdasarkan Kedalaman pada Lingkungan Pesisir Teluk Riau. Dibimbing oleh CHANDRA JOEI KOENAWAN dan ARIEF PRATOMO.

Ekosistem pesisir berperan penting dalam mitigasi perubahan iklim melalui kemampuannya menyerap dan menyimpan karbon dalam sedimen sebagai penyimpanan jangka panjang. Namun, informasi mengenai distribusi vertikal karbon sedimen berdasarkan kedalaman di kawasan pesisir Teluk Riau masih terbatas. Penelitian ini bertujuan menganalisis distribusi vertikal kandungan karbon organik sedimen, menghitung stok karbon berdasarkan profil kedalaman, serta mengidentifikasi pola perubahan karbon sepanjang profil vertikal di kawasan pesisir Teluk Riau. Penelitian dilaksanakan pada April–Juni 2026 di sembilan stasiun pengamatan. Sampel sedimen diambil menggunakan *sediment core* pada kedalaman 0–30 cm dan dibagi menjadi tiga interval, yaitu 0–10 cm, 10–20 cm, dan 20–30 cm. Kandungan karbon organik dianalisis menggunakan metode *Loss on Ignition* (LOI), sedangkan stok karbon dihitung berdasarkan kandungan karbon organik, *bulk density*, dan ketebalan lapisan sedimen. Hasil penelitian menunjukkan kandungan karbon organik berkisar antara 1,66–15,02% dengan rata-rata 8,28%. Rata-rata kandungan karbon pada kedalaman 0–10 cm, 10–20 cm, dan 20–30 cm berturut-turut sebesar 8,61%, 8,00%, dan 8,23%, yang menunjukkan distribusi vertikal relatif homogen. Hasil uji *Repeated Measures ANOVA* menunjukkan tidak terdapat perbedaan yang signifikan antarlapisan kedalaman. Temuan ini menunjukkan bahwa sedimen pesisir Teluk Riau berpotensi sebagai penyimpan karbon jangka panjang serta dapat menjadi data dasar dalam pengelolaan ekosistem karbon biru dan mitigasi perubahan iklim di wilayah pesisir.

Kata kunci: Distribusi Vertikal, Karbon Sedimen, Loss on Ignition (LOI), Stok Karbon, Teluk Riau

SUMMARY

EVELYN YESANIA TARIHORAN. Vertical Distribution of Sedimentary Carbon by Depth in the Coastal Environment of Riau Bay. Supervised by CHANDRA JOEI KOENAWAN and ARIEF PRATOMO.

Coastal ecosystems play a crucial role in climate change mitigation through their ability to absorb and store carbon in sediments as a long-term carbon sink. However, information on the vertical distribution of sedimentary carbon based on depth in the coastal area of Riau Bay remains limited. This study aims to analyze the vertical distribution of organic carbon content in sediments, calculate carbon stocks based on depth profiles, and identify patterns of carbon variation along the vertical profile in the coastal area of Riau Bay. The study was conducted from April to June 2026 at nine observation stations. Sediment samples were collected using sediment cores at depths of 0–30 cm and divided into three intervals: 0–10 cm, 10–20 cm, and 20–30 cm. Organic carbon content was analyzed using the Loss on Ignition (LOI) method, while carbon stock was calculated based on organic carbon content, bulk density, and sediment layer thickness. The results showed that organic carbon content ranged from 1,66–15,02%, with an average of 8,28%. The average carbon content at depths of 0–10 cm, 10–20 cm, and 20–30 cm was 8,61%, 8,00%, and 8,23%, respectively, indicating a relatively homogeneous vertical distribution. The results of the Repeated Measures ANOVA test showed no significant differences among the depth layers. These findings indicate that the coastal sediments of Riau Bay have the potential to serve as long-term carbon sinks and can provide baseline data for the management of blue carbon ecosystems and climate change mitigation in coastal areas.

Keywords: Carbon Stock, *Loss On Ignition* (LOI), Riau Bay, Sedimentary Carbon, Vertical Distribution