

RINGKASAN

SRI WAHYUNI. Estimasi Laju Sedimentasi di Perairan Sei Carang, Kota Tanjungpinang. Dibimbing oleh WINNY RETNA MELANI dan TRI APRIADI.

Perairan Sei Carang merupakan kawasan estuari di Kota Tanjungpinang yang dipengaruhi oleh dinamika pasang surut dan aktivitas daratan seperti penambangan bauksit dan kerusakan mangrove, sehingga berpotensi meningkatkan masukan sedimen terutama saat musim hujan. Penelitian ini bertujuan untuk mengetahui kondisi parameter fisika, laju sedimentasi, karakteristik sedimen, hubungan parameter fisika dengan laju sedimentasi, serta mengetahui sebaran spasial laju sedimentasi di perairan Sei Carang. Penelitian dilaksanakan pada Februari 2026 di dua stasiun pengamatan yang ditentukan menggunakan metode *purposive sampling*. Stasiun 1 berada di kawasan pascatambang bauksit dan stasiun 2 berada di anakan sungai hulu estuari. Masing-masing stasiun ditentukan 15 titik secara acak. Pengambilan data meliputi data primer berupa parameter fisika perairan (kekeruhan, kecerahan, kedalaman, kecepatan arus), laju sedimentasi yang diukur menggunakan *sediment trap*, serta ukuran butir sedimen, dan data sekunder berupa data pasang surut dan curah hujan dari BMKG Kota Tanjungpinang. Prosedur penelitian meliputi pengukuran parameter fisika perairan secara *in situ*, pemasangan *sediment trap* selama 28 hari dengan pengambilan sampel setiap 7 hari; sedimen hasil tangkapan *sediment trap* tersebut kemudian dianalisis ukuran butirnya menggunakan metode pengayakan (*sieve shaker*) dan perangkat lunak Gradistat. Data dianalisis secara deskriptif, dihubungkan antara parameter fisika dengan laju sedimentasi menggunakan uji korelasi Pearson (*Bivariate Correlation*), serta sebaran laju sedimentasi dipetakan dengan metode *Inverse Distance Weighting* (IDW) pada QGIS. Hasil menunjukkan parameter fisika bervariasi selama empat minggu, dengan kekeruhan tertinggi dan kecerahan terendah pada minggu ketiga, bersamaan curah hujan tertinggi yaitu 104 mm. Laju sedimentasi tertinggi pada minggu ketiga (4.151,28 g/m²/minggu di stasiun 1; 3.001,70 g/m²/minggu di stasiun 2). Sedimen di kedua stasiun didominasi fraksi pasir. Uji korelasi Pearson menunjukkan kekeruhan dan kecerahan berhubungan paling kuat dan signifikan dengan laju sedimentasi. Pada stasiun 1, kekeruhan ($r = 0,910$, kategori sangat kuat) mengindikasikan hampir seluruh variasi laju sedimentasi berkaitan erat dengan kekeruhan, sedangkan kecerahan ($r = -0,718$, kuat) menunjukkan penurunan kecerahan konsisten diikuti kenaikan laju sedimentasi. Pada Stasiun 2, pola serupa ditemukan (kekeruhan $r = 0,860$; kecerahan $r = -0,722$) dengan keeratan sedikit lebih rendah. Hasil pemetaan IDW menunjukkan sebaran laju sedimentasi cenderung lebih tinggi di kawasan pascatambang bauksit. Berdasarkan hasil yang telah dilakukan, penelitian ini diharapkan dapat menjadi dasar pengelolaan kawasan perairan secara berkelanjutan.

Kata kunci: Karakteristik Sedimen, Korelasi Pearson, Laju Sedimentasi, *Sediment Trap*, Sei Carang

SUMMARY

SRI WAHYUNI. Estimation of Sedimentation Rates in the Waters of Sei Carang, Tanjungpinang City. Supervised by WINNY RETNA MELANI and TRI APRIADI.

The Sei Carang waters are an estuarine area in Tanjungpinang City that is influenced by tidal dynamics and land-based activities such as bauxite mining and mangrove destruction, which have the potential to increase sediment input, especially during the rainy season. This study aims to determine the conditions of physical parameters, sedimentation rates, sediment characteristics, the relationship between physical parameters and sedimentation rates, and the spatial distribution of sedimentation rates in the Sei Carang waters. The study was conducted in February 2026 at two observation stations selected using purposive sampling. Station 1 is located in a post-bauxite mining area, and station 2 is located in an upstream tributary of the estuary. 15 sampling points were randomly selected at each station. Data collection included primary data on water physical parameters (turbidity, transparency, depth, current velocity), sedimentation rates measured using sediment traps, and sediment grain size, as well as secondary data on tidal patterns and rainfall from the BMKG in Tanjungpinang. The research procedures included in situ measurements of water physical parameters, the installation of sediment traps for 28 days with sampling every 7 days; the sediment collected by the sediment traps was then analyzed for grain size using a sieve shaker and Gradistat software. The data were analyzed descriptively; correlations between physical parameters and sedimentation rates were assessed using Pearson's correlation test (bivariate correlation), and the distribution of sedimentation rates was mapped using the met. The data were analyzed descriptively; the relationship between physical parameters and sedimentation rates was examined using Pearson's correlation test (bivariate correlation), and the distribution of sedimentation rates was mapped using the Inverse Distance Weighting (IDW) method in QGIS. The results showed that the physical parameters varied over the four-week period, with the highest turbidity and lowest clarity occurring in the third week, coinciding with the highest rainfall of 104 mm. The highest sedimentation rates occurred in the third week (4,151.28 g/m²/week at Station 1; 3,001.70 g/m²/week at Station 2). Sediments at both stations were dominated by the sand fraction. The Pearson correlation test indicated that turbidity and clarity were most strongly and significantly correlated with sedimentation rates. At Station 1, turbidity ($r = 0.910$, very strong category) indicated that nearly all variation in sedimentation rate was closely related to turbidity, while clarity ($r = -0.718$, strong) showed that a decrease in clarity was consistently followed by an increase in sedimentation rate. At Station 2, a similar pattern was found (turbidity $r = 0.860$; clarity $r = -0.722$) with a slightly lower correlation strength. IDW mapping results show that sedimentation rates tend to be higher in post-bauxite mining areas. Based on these findings, this study is expected to serve as a foundation for the sustainable management of aquatic areas.

Keywords: Pearson Correlation, Sediment Characteristics, Sedimentation Rate, Sediment Trap, Sei Carang