

ABSTRAK

SEBARAN HORIZONTAL *TRACE.ELEMENTS* (^{208}Pb , ^{63}Cu , ^{52}Cr , ^{66}Zn DAN ^{60}Ni) PADA SEDIMEN LAUT DALAM DI PERAIRAN SELAT MAKASSAR DAN SELAT LOMBOK

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Trace elements seperti ^{208}Pb , ^{63}Cu , ^{52}Cr , ^{66}Zn , dan ^{60}Ni merupakan kontaminan anorganik yang cenderung terakumulasi pada sedimen laut dalam. Penelitian ini bertujuan untuk menganalisis sebaran horizontal konsentrasi *trace elements*, ukuran butir sedimen, serta tingkat kontaminasi *trace elements* di perairan Selat Makassar dan Selat Lombok. Sampel sedimen dianalisis menggunakan ICP-MS dan PSA, kemudian dievaluasi menggunakan pemetaan spasial, *Contamination Factor* (CF), *Pollution Load Index* (PLI), dan *Principal Component Analysis* (PCA). Hasil menunjukkan Seng (^{66}Zn) memiliki konsentrasi rata-rata tertinggi. Distribusi spasial *trace elements* menunjukkan tren penurunan dari utara ke selatan, dengan konsentrasi tertinggi di Selat Makassar Utara, yang diduga kuat berasal dari limpasan daratan. Analisis PCA mengkonfirmasi korelasi negatif yang kuat antara konsentrasi *trace elements* ^{208}Pb , ^{52}Cr , ^{60}Ni dengan ukuran sedimen, yang berarti akumulasi tinggi terjadi pada fraksi sedimen halus (*clay*). Tingkat kontaminasi sedimen secara umum berada pada kategori rendah, meskipun titik tertinggi terdeteksi di utara. Penelitian tersebut penting sebagai dasar pemantauan kualitas lingkungan laut di kedua wilayah tersebut.

Kata Kunci: Karakteristik Biogeokimia, Sedimen Laut Dalam, Selat Makassar, Tingkat Pencemaran, *Trace Elements*

ABSTRAK

HORIZONTAL DISTRIBUTION OF TRACE ELEMENTS (^{208}Pb , ^{63}Cu , ^{52}Cr , ^{66}Zn , AND ^{60}Ni) IN DEEP SEA SEDIMENTS IN THE WATERS OF THE MAKASSAR STRAIT AND THE LOMBOK STRAIT

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Trace elements such as ^{208}Pb , ^{63}Cu , ^{52}Cr , ^{66}Zn , and ^{60}Ni are inorganic contaminants that tend to accumulate in deep-sea sediments. This study was aimed to analyze the horizontal distribution of trace-element concentrations, sediment grain size, and the level of trace-element contamination in the waters of the Makassar Strait and Lombok Strait. Sediment samples were analyzed using Inductively Coupled Plasma–Mass Spectrometry (ICP-MS) and Particle Size Analysis (PSA), and subsequently evaluated through spatial mapping, Contamination Factor (CF), Pollution Load Index (PLI), and Principal Component Analysis (PCA). The results indicate that zinc (^{66}Zn) exhibits the highest average concentration among the analyzed trace elements. The spatial distribution of trace elements shows a decreasing trend from north to south, with the highest concentrations observed in the northern Makassar Strait, which are strongly associated with terrestrial runoff inputs. PCA results confirm a strong negative correlation between the concentrations of ^{208}Pb , ^{52}Cr , and ^{60}Ni and sediment grain size, indicating higher accumulation in fine-grained sediments (clay). Overall, sediment contamination levels are classified as low, although relatively higher values are detected in the northern area. This study provides an important scientific basis for monitoring and managing marine environmental quality in both regions.

Keywords: Biogeochemical Characteristics, Contamination Level, Deep-Sea Sediment, Makassar Strait, Trace Elements