

Distribusi Spasial Konsentrasi Parameter Kualitas Air di Bawah Instalasi Panel Surya Terapung = Spatial Distribution of Water Quality Parameters Concentration Under Floating Solar Panel Installation

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Abstrak

Penggunaan instalasi panel surya terapung memang memberikan keuntungan bagian pengembangan energi alternatif, terutama terkait keterbatasan lahan. Namun berdasar beberapa penelitian yang telah dilakukan, keberadaan panel surya terapung yang menutupi permukaan air terbukti mengakibatkan perubahan pada konsentrasi parameter kualitas air di bawahnya. Selain itu, beberapa penelitian lain yang menguji sampel di beberapa titik di bawah lokasi panel surya menghasilkan nilai yang berbeda meskipun sampel diambil pada kondisi serta cara yang sama. Penelitian ini bertujuan untuk menganalisis pola distribusi spasial dari konsentrasi DO, BOD, dan kekeruhan yang mungkin mengalami perubahan akibat keberadaan PLTS Terapung Danau Mahoni, Universitas Indonesia. Selain itu, diberikan pula rekomendasi terkait potensi pengembangan panel surya terapung berdasarkan pola distribusi spasial yang didapatkan. Sampel air diambil dari 16 titik yang berada di area panel surya terapung mulai pukul 10.00 WIB dengan frekuensi 2 kali pengambilan selama bulan April untuk menghindari kondisi hujan yang dapat mengubah kualitas air danau. Pengujian dilakukan secara ex situ di Laboratorium TPL, DTSL FTUI. Proses pengolahan dan analisis data dilakukan menggunakan beberapa metode seperti statistik deskriptif, uji normalitas, uji korelasi, uji ANOVA, uji Kruskal-Wallis, serta pemetaan spasial menggunakan metode IDW dengan bantuan software ArcGIS. Berdasarkan seluruh pengujian tersebut dapat disimpulkan bahwa terdapat perbedaan atau perubahan konsentrasi BOD yang signifikan mengikuti arah aliran danau. Sebaliknya, tidak ditemukan perbedaan atau perubahan dengan pola tertentu pada konsentrasi DO dan kekeruhan. Kemudian, sifat perbedaan atau perubahan yang terjadi pada konsentrasi BOD adalah penurunan, sehingga pengembangan panel surya mengikuti arah aliran danau dapat dilakukan karena memberikan dampak positif terhadap kualitas air. Pengembangan juga dapat dilakukan pada melintang aliran danau karena tidak ditemukan perbedaan atau perubahan kualitas air yang signifikan.

.....The use of floating solar panel installations does provide benefits for the development of alternative energy, especially regarding limited land. However, based on several studies that have been carried out, the existence of floating solar panels that cover the water surface is proven to cause changes in the concentration of water quality parameters below. In addition, several other studies that tested samples at several points below the location of the solar panels produced different values even though the samples were taken under the same conditions and methods. This study aims to analyze the spatial distribution pattern of DO, BOD, and turbidity concentrations that may change due to the existence of PLTS Floating Lake Mahoni, University of Indonesia. In addition, recommendations are also given regarding the potential for developing floating solar panels based on the spatial distribution pattern obtained. Water samples were taken from 16 points in the floating solar panel area starting at 10.00 WIB with a frequency of 2 times during April to avoid rainy conditions that could change the quality of the lake water. The test was carried out ex-situ at the TPL Laboratory, DTSL FTUI. The data processing and analysis were carried out using several methods such as descriptive statistics, normality test, correlation test, ANOVA test, Kruskal-Wallis test, and spatial

mapping using the IDW method with ArcGIS software. Based on all these tests, it can be concluded that there are significant differences or changes in BOD concentration following the direction of the lake flow. On the other hand, there was no difference or change with a certain pattern in DO concentration and turbidity. Then, the nature of the difference or change that occurs in the concentration of BOD is a decrease, so the development of solar panels following the direction of the lake flow can be done because it has a positive impact on water quality. Development can also be carried out across the lake flow because there are no significant differences or changes in water quality.