

Hubungan Produktivitas Primer Fitoplankton dan Klorofil-a pada Kondisi Permukaan Air Tertutup dan Terbuka (Studi Kasus: Instalasi Solar Panel Terapung di Danau Mahoni UI) = Phytoplankton Primary Productivity Relationship and Chlorophyll-a in Closed and Open Water Surface Conditions (Case Study: Floating Solar Panel Installation on Lake Mahoni UI)

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Abstrak

Penutupan permukaan air menghalangi cahaya matahari yang masuk ke badan air sehingga mengganggu proses fotosintesis fitoplankton. Konsentrasi klorofil-a berpengaruh terhadap perubahan aktivitas fitoplankton yang akan mempengaruhi produktivitas primer. Tujuan dari penelitian untuk menganalisis pengaruh kedalaman terhadap produktivitas primer fitoplankton dan klorofil-a serta korelasi antar keduanya pada kondisi dengan dan tanpa adanya penutupan permukaan air. Penelitian dilakukan di Solar Panel Terapung (SPT) Danau Mahoni UI. Sampel diambil pada kedalaman 30 cm dan 60 cm pada kondisi tertutup dan kondisi terbuka. Analisis data dilakukan dengan menggunakan regresi, uji parametrik independent t test, uji korelasi Pearson dan Spearman Rho. Berdasarkan nilai rata-rata, menunjukkan bahwa kedalaman air memberikan pengaruh terhadap kedua parameter. Namun, berdasarkan uji independent t test didapatkan nilai sig. (2-tailed) $>0,05$ bahwa tidak terdapat perbedaan nilai produktivitas primer dan konsentrasi klorofil-a yang berarti antara kedalaman 30 cm dengan kedalaman 60 cm. Hubungan produktivitas dengan klorofil-a pada kondisi tertutup menghasilkan koefisien determinasi (R^2) sebesar 0,8, sementara kondisi terbuka menghasilkan R^2 sebesar 0,088. Hasil analisis menunjukkan bahwa korelasi produktivitas primer dengan klorofil-a lebih kuat pada kondisi tertutup. Keberadaan penutupan permukaan badan air berupa solar panel terapung memberikan pengaruh yang signifikan terhadap penurunan nilai produktivitas primer dan klorofil-a.

.....The closure of the water surface blocks the sunlight that enters the water body so that it interferes with the photosynthetic process of phytoplankton. The concentration of chlorophyll-a affects changes in phytoplankton activity which will affect primary productivity. The purpose of the study was to analyze the effect of depth on the primary productivity of phytoplankton and chlorophyll-a and the correlation between them in conditions with and without water surface cover. The research was conducted on the floating solar panel of Lake Mahoni UI. Samples were taken at a depth of 30 cm and 60 cm in closed and open conditions. Data analysis was performed using regression, parametric independent t test, Pearson and Spearman Rho correlation test. Based on the average value, it shows that the water depth has an effect on both parameters. However, based on the independent t test, the sig. value was obtained. (2-tailed) > 0.05 that there is no significant difference in the value of primary productivity and chlorophyll-a concentration between a depth of 30 cm and a depth of 60 cm. The relationship between productivity and chlorophyll-a in the closed condition resulted in a coefficient of determination (R^2) of 0.8, while the open condition resulted in an R^2 of 0.088. The results of the analysis showed that the correlation of primary productivity with chlorophyll-a was stronger in closed conditions. The existence of surface cover of water bodies in the form of floating solar panels has a significant effect on the decrease in the value of primary productivity and chlorophyll-a.