

HUBUNGAN PRODUKTIVITAS PRIMER FITOPLANKTON DENGAN DISTRIBUSI NUTRIEN DI WADUK SERMO, KULON PROGO

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INTISARI

Waduk Sermo sebagai satu di antara area rekreasi dan sumber air di Kulon Progo terletak sangat dekat pemukiman warga. Aktivitas manusia serta pengalihan area di sekitar Waduk Sermo menjadi pertanian berpotensi meningkatkan laju erosi, sedimentasi, dan masukan-masukan nutrien ke dalam waduk. Lahan pertanian tersebar di daerah tangkapan air Waduk Sermo membentuk aliran limpasan permukaan dikala musim hujan yang berpotensi membawa nutrien berlebih masuk ke badan air. Akumulasi nutrien yang terbawa limpasan permukaan dari pupuk berlebih pertanian ke dalam perairan, akan direspon oleh komunitas fitoplankton. Penelitian dilakukan pada bulan dasarian III (10 hari terakhir) bulan Oktober di Waduk Sermo didapat hasil bahwa nilai produktivitas primer berkisar 137-1035 gC/m³/tahun, mengindikasikan status trofik eutrofik dengan hubungan positif antara produktivitas primer fitoplankton dan distribusi nutrien. Konsentrasi nutrien lebih tinggi di dekat inlet akibat limpasan dari aktivitas antropogenik dan berkurang menuju outlet akibat proses pengenceran, sedimentasi, atau asimilasi. Distribusi nutrien secara vertikal ditemukan bahwa nitrat dan fosfat lebih banyak terkonsentrasi di lapisan hipolimnion karena dekomposisi organik. Distribusi nutrien secara spasial memiliki keterkaitan signifikan dengan kelimpahan fitoplankton, terutama alga koloni yang merespons kadar nutrien dan parameter fisikokimia. Komunitas fitoplankton di Waduk Sermo cenderung melimpah, dengan indeks dominansi yang bergantung pada kondisi fisikokimia, ketersediaan nutrien, dan variasi spasial.

Kata kunci : *algal bloom*; eutrofikasi; distribusi nutrien; produktivitas primer.

PHYTOPLANKTON PRIMARY PRODUCTIVITY IN RELATION TO DISTRIBUTIONS OF NUTRIENTS IN SERMO RESERVOIR, KULON PROGO

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ABSTRACT

Sermo Reservoir, as one of the recreational areas and water sources in Kulon Progo, is located in close proximity to residential areas. Human activities and land-use changes into agricultural areas around Sermo Reservoir have increased erosion, sedimentation, and nutrient inputs into the reservoir. Agricultural land scattered within the catchment area of Sermo Reservoir generates surface runoff during the rainy season, potentially carrying excessive nutrients into the water body. The accumulation of nutrients from agricultural fertilizer runoff is responded to by the phytoplankton community. Research conducted during the third ten-day period (decad) of October in Sermo Reservoir found that primary productivity ranged between 137-1035 gC/m³/year, indicating an eutrophic trophic status with a positive correlation between phytoplankton primary productivity and nutrient distribution. Nutrient concentrations were higher near the inlet due to runoff from anthropogenic activities and decreased toward the outlet as a result of dilution, sedimentation, or assimilation processes. In thermally stratified waters, nutrients were more concentrated in the hypolimnion layer due to organic decomposition. The spatial distribution of nutrients was significantly related to phytoplankton abundance, particularly colonial algae that respond to nutrient levels and physicochemical parameters. The phytoplankton community in Sermo Reservoir tends to be abundant, with dominance patterns varying depending on physicochemical conditions, nutrient availability, and spatial variation.

Keywords: algal bloom; eutrophication; nutrient distribution; primary productivity.