

**PEMANFAATAN CITRA MULTISPEKTRAL *PLÉIADES* UNTUK
PEMETAAN *TOTAL SUSPENDED SOLID (TSS)*
DI PERAIRAN WADUK JOMBOR, KABUPATEN KLATEN**

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ABSTRAK

Padatan tersuspensi/*Total Suspended Solid (TSS)* merupakan salah satu parameter kualitas air yang menjadi permasalahan di Waduk Jombor, diakibatkan proses erosi akibat perubahan penggunaan lahan di sekitar waduk. Pentingnya pemantauan *TSS* guna mengetahui distribusi *TSS* serta kadar *TSS* perairan Waduk Jombor apakah melebihi ambang batas yang telah ditetapkan guna pemanfaatan air Waduk Jombor. Peran penginderaan jauh berupa citra multispektral dan Sistem Informasi Geografi (SIG) berupa aplikasi berbasis spasial mampu memetakan dan mengetahui distribusi *TSS* secara spasial di Waduk Jombor. Tujuan dari penelitian ini untuk mengetahui distribusi spasial *TSS* di perairan Waduk Jombor serta data dengan akurasi terbaik untuk memetakan distribusi spasial *TSS*.

Data untuk memetakan distribusi spasial *TSS* di Waduk Jombor berupa citra multispektral *Pléiades* yang memiliki empat saluran spektral. Citra dilakukan proses transformasi nilai spektral pada tiap saluran yang ada untuk membuat nilai spektral baru. Pemodelan *TSS* dilakukan pada hasil transformasi nilai spektral menggunakan analisis regresi antara nilai piksel citra dengan nilai *TSS in-situ* sehingga diperoleh koefisien determinasi untuk memodelkan distribusi spasial *TSS* di Waduk Jombor.

Kadar *TSS* di perairan Waduk Jombor diketahui berdasarkan pemodelan sebesar 17 mg/l – 120 mg/l dengan persebaran merata di seluruh kawasan perairan Waduk Jombor dan kadar tertinggi *TSS* terkonsentrasi di tengah waduk yang berangsur-angsur menurun di tepi waduk. Kadar *TSS* tinggi memiliki asosiasi terhadap keberadaan karamba dimana perairan sekitar karamba juga memiliki kadar *TSS* cukup tinggi. Data terbaik untuk memetakan *TSS* di perairan Waduk Jombor yakni transformasi nilai spektral *Band 3/Band 1* dengan hasil uji akurasi *RMSE* sebesar 9,684.

Kata Kunci: Citra Multispektral, Waduk Jombor, *Total Suspended Solid*, Regresi.

**UTILIZATION OF PLEIADES MULTISPECTRAL IMAGE FOR TOTAL
SUSPENDED SOLID (TSS) MAPPING IN JOMBOR RESERVOIR, KLATEN
REGENCY**

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ABSTRACT

Suspended solids/Total Suspended Solid (TSS) is one of the water quality parameters that are a problem in the Jombor Reservoir, caused by the erosion process due to changes in land use around the reservoir. The importance of TSS monitoring is to determine the distribution of TSS and whether the TSS level in the Jombor Reservoir waters exceeds the threshold that has been set for the utilization of Jombor Reservoir water. The role of remote sensing in the form of multispectral images and Geographic Information Systems (GIS) in spatial-based applications can map and determine the spatial distribution of TSS in Jombor Reservoir. The purpose of this study was to determine the spatial distribution of TSS in the waters of the Jombor Reservoir and the data with the best accuracy to map the spatial distribution of TSS.

The data to map the spatial distribution of TSS in Jombor Reservoir is in the form of Pleiades multispectral imagery, which has four spectral channels. The image is carried out by transforming the spectral value on each existing channel to create a new spectral value. TSS modelling was carried out on the results of the transformation of spectral values using regression analysis between the image pixel values and the in-situ TSS values so that the coefficient of determination was obtained to model the spatial distribution of TSS in the Jombor Reservoir.

TSS levels in the waters of Jombor Reservoir are known based on modelling at 17 mg/l – 120 mg/l with uniform distribution throughout the Jombor Reservoir waters, and the highest levels of TSS are concentrated in the middle of the reservoir, which gradually decreases at the edge of the reservoir. High TSS levels are associated with cages, where the waters around the cages also have high levels of TSS. The best data for mapping TSS in the waters of the Jombor Reservoir is the transformation of the Band 3/Band 1 spectral value with the RMSE accuracy test result of 9,684.

Keywords: Multispectral Imagery, Jombor Reservoir, Total Suspended Solid, Regression.