

Analysis of SPOT- 5 data for mapping turbidity level of River Klang, Peninsular Malaysia.

ABSTRACT

Water bodies in urban area are considered important ecological and sociological zones. Protection and management of urban water bodies such as lakes and rivers are a primary objective to related agencies such as Department of Environment Malaysia and Municipal Council, where sediment and other debris from uncontrolled sewage system are affected water quality and reduced the function of water bodies. The traditional measurement of water quality requires in situ sampling, which is relatively costly and time-consuming effort. Due to these impediments, it is not impractical to cover the whole water bodies. Therefore, it would be advantageous if we able to detect and monitor water quality level at large coverage of water bodies with minimal field measurement. The application of remote sensing in water quality control would provide resources managers' with tools to monitor and maintain water bodies in a well-timed and cost-effective manner. The aims of this study were two folds: to map water turbidity and classify water turbidity level on SPOT 5 data based on Department of Environment classification index. A spectral reflectance of remote sensing was obtained SPOT 5 imagery for river surface analyses. By referring to the in-situ measurements of River Klang collected in September 13, 2005 at three permanent stations, which were Jambatan Pelabuhan Utara, Jambatan Bandar Kelang and Jambatan Cannought Kelang, aid with reflectance data from SPOT 5 data imagery of August 16, 2005, a spectral indicators for the above mentioned water quality parameter were analysed. Turbidity concentration levels were quantified using band 3 [NIR] (0.79 - 0.89 μm), which showed a linear relationship with in situ measurement. From spectral reflectance analysis, the best single band to represent water turbidity differences was Band 3 Result from the remote sensing analysis generates a map of water turbidity level into three classes that were high (65 – 68 DN Value), moderate (58 – 63 DN Value) and low turbidity (51 – 57 DN Value). The causes of water turbidity were due to sediment concentration caused by human activities and high development area. However, the use of higher resolution remote sensing to assess the water turbidity precisely and timely is recommended in future research.

Keyword: Water turbidity mapping; Remote sensing; River Klang.