Kajian spasial dan temporal kualitas perairan teluk Jakarta

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Abstrak

ABSTRACT
Since the Jakarta Bay is economically important for various stake holders, then understanding the eutrophication processes, condition and its status, in the past, present time, and in the future through scientific research is inevitable.

The objectives of this research are (1) To analyze the water quality parameters that can be used as an indicator of eutrophication phenomenon, (2) To develop monitoring tools for observing eutrophication process, and (3) To assess the tendency of eutrophication in the future using ASSETS (Assessment of Estuarine Trophic Status) model.

The method used in this research is marine remote sensing techniques through the application of multi-temporal and multi-sensor of Landsat satellites data. Results from field sampling of water quality data indicated that the mean of water transparency were stable during 1970?s to 1990?s around 7.5 m, but sharply decreased to 3.8 m in 2000?s On the other hand, the mean chlorophyll-a concentration showed a reversal pattern from water transparency, that the concentration was rapidly increased from 1.71 to 7.8 g/m3 during 1970?s to 2000?s. Based on these data, eutrophication is occuring in the Jakarta Bay.

Empirical model for predicting water transparency developed using multitemporal Landsat-7 ETM+ data and field data collected in 2004 indicated that the model was good and capable to predict water transparency. The model was applied to both old Landsat aquired in 1970?a (Landsat-1, 2 and 3 MSS), 1980?s (Landsat-4 and 5 MSS and TM), and 1990?s (Landsat-5 and 7, TM and ETM+), as well as the latest data of 2000?s (Landsat-7 ETM+). Maps of water transparency and Trophic State Indeks (TSI) derived from emprical predicting model indicated a decreasing tendency of water transparency from 7.5 to 4.0 m during the 1970?s to 2000?s with the higest decreasing rate from 1980?s to 2000?s, while the TSI showed an oligotrophic condition during 1970?s to 1980?s, but move to mesotrhopic condition in 1990, and decreasing to eutrophic and hypertrophic condition in 2000?s. Thus, all these facts proved that the eutrophication is still going from the past to the present time. Utilization of ASSETS model for knowing the eutrophication of Jakarta Bay in the future based on several input parameters showed that strong eutrophicatiom will be continued in the future in which caused worsen condition of the water quality.</i>