

Applications of GIS and remote sensing in the hydrological study of the Upper Bernam River Basin, Malaysia

ABSTRACT

Rising concern over the degradation of the environment, such as erosion and sediment loads, warrants the integration of the complex and dispersed geographical data sets. This paper describes the use of Geographic Information System (GIS) and remote sensing for assessing the impact of land use changes to water turbidity in multiple watersheds. In this study, necessary data sets representing land uses, hydrology, weather, soils, elevation, and surface characteristics were integrated in a GIS in tabular, vector and grid formats. The land use maps that were derived from Landsat-5 TM imagery using a combination of different classification strategies gave an average accuracy of 95 %. Results from data analysis had shown that there exists a close relationship existed between the extent of open area and sedimentation loading rate. However, the sediment loading rates were found to be non-linear ranging from 1.47 to 2.13 tonnes per millimeter of rainfall for each kilometer-square increase of open areas, depending on their location of open areas with respect to factors such as availability of sediment, soil type, slope length, and slope steepness etc.

Keyword: GIS; Remote sensing; River basin; Sediment load; Sedimentation