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Investigating algorithm to estimate shallow water bathymetry from multi-temporal satellite imageries

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Information concerning water depth of near shore water region is one of the most basic requirements for coastal zone management. Bathymetry is especially important for near coastal lines, where changes can occur rapidly due to sedimentation and erosion. Here, a simple method for estimating water depths from single spectral band is described and is applied to multi-temporal and multi-source passive remote sensing data such as Landsat 7, Landsat 8 and ASTER data. The proposed empirical method is a combination of physical and statistical model. Two different methods; Single Band Algorithm (SBA) and Radiance Based Estimation (RBE) were applied to estimate bathymetry from NIR band of multi-temporal images. The RBE, basically proposed by this study is only applied when there is no in-situ depth data available. Both methods assume a constant attenuation coefficient and homogenous bottom type all over the study area. Lyzenga' noise correction method has been used to remove atmospheric and water column reflectance. The accuracy of the depth algorithm is determined by comparison with ground-truth measurements. The correlation coefficient of least square fit and RMSE to detect the good quality of the bathymetry is derived by the proposed method. The proposed method has been provided for good correlation with various data sources with different radiometric and spatial resolution. Various methods have been developed by several authors who were tested and compared with the proposed method. Results obtained by the proposed method are comparatively better than the other methods. High radiometric resolution data (Landsat 8) provides better correlation with ground truth information than other data sources.

Biography

Vinayaraj Poliyapram has completed his Masters in Geoinformatics and is engaged in PhD studies at Osaka City University, Japan. He is presently receiving Monbukagakusho scholarship from Japan Government. Soon after completing Masters Degree, he has been working as a Research Assistant in National Institute of Oceanography (NIO), Goa. During his tenure in NIO, he qualified UGC-NET examination. He has published several papers in reputed journals.

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Impact of monthly curve number and five days antecedent rainfall-runoff data set on performance of SCS-CN method for Ozat catchment in India: A case study

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The Soil Conservation Service Curve Number (SCS-CN) is a well-established and widely used loss-rate model to compute surface runoff volume. It combines watershed and climatic parameters in one entity curve number (CN). Much of the variability in CN has been attributed to antecedent runoff condition (ARC). The (CN) exhibits an inherent seasonality beyond its spatial variability, which cannot be accounted for by the conventional methods. In the present study, CN were determined by standard CN procedure, month wise CN and five days antecedent rainfall-runoff (ARR) data set using standard asymptotic fit and gauged rainfall-runoff data with an objective to evaluate the impact of monthly CN and five days ARR data set on runoff estimation for Ozat catchment (Gujarat State-India). This study shows that the runoff predictive capability of SCS-CN methods can be improved by using monthly CN and five days ARR data set.

Biography

Manoj J Gundalia has completed his BE in Civil Engineering from M.S. University and did ME in Civil (Water Resources Management) Engineering from Gujarat University. He has published 3 research papers in national journals and 6 research papers in international journals. He has 14 years of field experience and 5 years of teaching experience and currently he is Assistant Professor and Head of the Department of Civil Engineering in Dr. Subhash Technical Campus, Junagadh, affiliated with Gujarat Technological University, Ahmedabad, Gujarat, India.

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