

## Object Oriented Classification Based on Feature Extraction Approach for Change Detection in Coastal Ecosystem across Kochi Region

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**Abstract :** Change detection of coastal ecosystem plays a vital role in monitoring and managing natural resources along the coastal regions. The present study mainly focuses on the decadal change in Kochi islands connecting the urban flatland areas and the coastal regions where sand deposits have taken place. With this, in view, the change detection has been monitored in the Kochi area to apprehend the urban growth and industrialization leading to decrease in the wetland ecosystem. The region lies between 76°11'19.134"E to 76°25'42.193"E and 9°52'35.719"N to 10°5'51.575"N in the south-western coast of India. The IRS LISS-IV satellite image has been processed using a rule-based algorithm to classify the LULC and to interpret the changes between 2005 & 2015. The approach takes two steps, i.e. extracting features as a single GIS vector layer using different parametric values and to dissolve them. The multi-resolution segmentation has been carried out on the scale ranging from 10-30. The different classes like aquaculture, agricultural land, built-up, wetlands etc. were extracted using parameters like NDVI, mean layer values, the texture-based feature with corresponding threshold values using a rule set algorithm. The objects obtained in the segmentation process were visualized to be overlaying the satellite image at a scale of 15. This layer was further segmented using the spectral difference segmentation rule between the objects. These individual class layers were dissolved in the basic segmented layer of the image and were interpreted in vector-based GIS programme to achieve higher accuracy. The result shows a rapid increase in an industrial area of 40% based on industrial area statistics of 2005. There is a decrease in wetlands area which has been converted into built-up. New roads have been constructed which are connecting the islands to urban areas as well as highways. The increase in coastal region has been visualized due to sand depositions. The outcome is well supported by quantitative assessments which will empower rich understanding of land use land cover change for appropriate policy intervention and further monitoring.

**Keywords :** land use land cover, multiresolution segmentation, NDVI, object based classification

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