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Hyperspectral Mapping Methods for Differentiating Mangrove Species along Karachi Coast

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Abstract : It is necessary to monitor and identify mangroves types and spatial extent near coastal areas because it plays an important role in coastal ecosystem and environmental protection. This research aims at identifying and mapping mangroves types along Karachi coast ranging from 24.79 to 24.85 degree in latitude and 66.91 to 66.97 degree in longitude using hyperspectral remote sensing data and techniques. Image acquired during February, 2012 through Hyperion sensor have been used for this research. Image preprocessing includes geometric and radiometric correction followed by Minimum Noise Fraction (MNF) and Pixel Purity Index (PPI). The output of MNF and PPI has been analyzed by visualizing it in n-dimensions for end-member extraction. Well-distributed clusters on the n-dimensional scatter plot have been selected with the region of interest (ROI) tool as end members. These end members have been used as an input for classification techniques applied to identify and map mangroves species including Spectral Angle Mapper (SAM), Spectral Feature Fitting (SFF), and Spectral Information Diversion (SID). Only two types of mangroves namely Avicennia Marina (white mangroves) and Avicennia Germinans (black mangroves) have been observed throughout the study area.

Keywords : mangrove, hyperspectral, hyperion, SAM, SFF, SID
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