

## **MAPPING THE COVERAGE OF SEAGRASS MEADOWS OF GULF OF MANNAR AND PALK BAY (INDIA) USING LANDSAT ETM+ DATA**

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In this study it is attempted to develop new approaches using remote sensing satellite data for better mapping and monitoring of sea grass in shallow waters (<15 m) of the Gulf of Mannar and Palk Bay. The methodology adopts atmospheric correction of satellite data, water column corrections and supervised classifications for characterization of the sea grass. Reconnaissance survey of the area was done to collect the ground-truth and field spectroradiometer was used for measuring reflectance of sand and bottom substrate types. Atmospheric correction was carried-out to retrieve water leaving radiance and water column correction was carried-out using analytical algorithm for Landsat ETM+ band 1-3. Although the panchromatic band has higher spatial resolution (15 m) that could not be used for the mapping due to its wider bandwidth (0.515–0.896  $\mu\text{m}$ ) and low relative spectral response. In addition to the above depth-invariant index method was also used. The atmospheric correction improves the contrast of the images which helps to map and characterize the seagrass and other features in a better way. Seagrass areas of Gulf of Mannar and Palk Bay were classified and mapped along with ground truth using the satellite data. An area of 127.98 Ha of seagrass cover was estimated in Munaikkadu site of the Palk Bay coast, and 386.19 Ha of seagrass cover was estimated in Vethalei site of the Gulf of Mannar. The atmospheric correction algorithm applied to the Landsat ETM+ image improved significantly the contrast between seagrass, sand and water. Overall accuracy in Water leaving radiance ( $L_w$ ) image (85.19% and 92.59%) showed significant improvement over the raw image accuracy (77.78% and 81.48%) for both study sites. The pixel size in Landsat ETM+ (30 m) produce bias in the accuracy of results because the heterogeneous nature of pixel. Besides the inherent spectral and spatial limitations of Landsat ETM+ data in studies of seagrass meadows and other submerged habitats, this method is useful for remote sensing in coastal environments.

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