



Water Area Extraction Using Geocoded High Resolution Imagery of TerraSAR-X Radar Satellite in Cloud Prone Brahmaputra River Valley

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Abstract: In this study, supervised pixel based maximum likelyhood classifier (MLC) was evaluated for differentiating water area from non-water area in a cloud prone river valley region using images obtained from German TerraSAR-X radar satellite. TerraSAR-X satellite microwave data acquired on 8th May 2008 was used for a test site in Brahmaputra river valley, India. The performance of traditional supervised (MLC) classification method was evaluated on TerraSAR's X band strip geo coded high resolution (6 meter) images in VV polarization channel. The 42 training sites for water area and 40 training sites for non-water areas were carefully selected over the entire image where optical Resourcesat - 1 LISS IV multi-spectral image and pre-classification ground truth were used as apriori knowledge. The calculated backscatter coefficient ranges from approximately -24.1 to 6.5 dB where water areas usually have low dB value around -20 dB. Overall classification accuracy was 94.92 %. This study shows that high resolution TerraSAR-X radar satellite image have advantage of weather independence over optical data. Furthermore, the supervised (MLC) classification can be used for extraction of water area from single band high resolution radar images where traditional water area extraction methods i.e., NDVI, NDWI etc., can not be used on radar images.

Keywords: TerraSAR-X Radar Satellite Images, Supervised (MLC) Classifier, Accuracies, Water and Non-water area.