

Comparison of Data Classification Techniques for Wetland Mapping Using Hyperspectral Data

Alvin Lau Meng Shin, Mazlan Hashim
Department of Remote Sensing Universiti Teknologi Malaysia
Faculty of Geoinformation Science & Engineering
Johor 81310 Malaysia
E-mail : mazlan@fksg.utm.my

Remote sensing provides an important tool for exploring, monitoring, and analyzing wetland systems. Most of the early studies carried out in the mid 90's have used multi-spectral scanners which were subjected to limitations of spatial and spectral resolution. When the spectral and spatial limitations of multi-spectral scanners are considered, one can begin to appreciate the difficulties in using data from these sensors for mapping and analyzing areas as complex as wetlands. To overcome the problems as stated above, hyperspectral sensor is therefore used. This paper highlights the comparison of classification techniques for hyperspectral data by looking into results of classification of an airborne Pushbroom Hyperspectral Imager (PHI) hyperspectral data for wetland mapping in Langkawi Island, Malaysia. Two issues addressed in the study are : (1) which of the hyperspectral classification techniques would provide improvised classification accuracy over high spatial resolution (2m) of PHI data for wetland mapping, and (2) whether or not high spatial resolution PHI data will help in improvising classification accuracy significantly especially when the mixed pixels are abundant in mapping mangrove classes. Three classification algorithms examined in this study, namely Binary encoding, Spectral Angle Mapper and Linear spectral Unmixing. All the necessary data calibrations (radiometric, atmospheric, topographic calibration and normalization) were applied to the test sites prior to data classification.