An integrated low cost remote sensing approach for monitoring and analyzing changes of Abu Dhabi mangrove

Abstract

This study aims to develop the performance and accuracy of the spectral Angular Mapper (SAM) in order to produce precise maps for mangrove trees with low cost and time consuming.

To achieve this purposes, the following steps have been done:

1. Collect high number of training samples from Quichbird images with a spatial resolution of 0.6 m to train the algorithm
2. Apply a 3×3 Sobel filter, Sieving classes, Majority/Minority analysis to refine and eliminate dark and isolated pixels in the classified maps and thus, increase its accuracy.

This study also aims to monitor the changes in mangrove forests during the period from 1990 to 2015 by subtracting every pair of the enhanced mangrove maps (aim1) using Image Difference algorithm (ID)

The study showed important results and contributions as follows:

- A significant improve of the algorithm performance and consequently, the produced 1990, 2000 and 2015 maps with an overall accuracy of 89.069 %, 90.122 and 96.096 %, respectively.
- A significant increase in the mangrove plantation in Ghanadah area than elsewhere in the study area
- The highest area of dense and healthy mangrove was observed in Abu Dhabi Mangrove National Park and its adjoining areas.

A strong spatial association between topography and tidal channels and the spatial distribution and density of Abu Dhabi Mangrove.