

Mapping of Sabah Islands using Airborne Hyperspectrometer

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Abstract

Human recreational activities and tourism are concentrated on the islands and in coastal waters, often depending on the maintenance of high water quality. The managing of impacts of urbanization and industrialization on the coastal zone ecology has become a high priority for many nations such as Malaysia and, hence, the need to develop better methods for monitoring and predicting change in islands and their coastal systems. Many of the dynamics of the open ocean, islands and changes in their coastal areas can be mapped and monitored using remote sensing techniques. Hyperspectral imaging is a tool that can provide an increasing number of marine and coastal properties over a spatial and temporal range. The remote-sensing measurements of some selected Sabah islands and their coastal waters were collected using a 4 kg "bread-box" sized UPM-APSB's AISA (Airborne Imaging Spectroradiometer for different Applications) airborne spectrographic imager where it was flown over the islands of Bohey, Mabul, Pom-Pom, Kulapuan, Omadal and Larapan study areas as part of the 2004 Sabah's "Ops Pasir" inaugural flight experiment in Sabah on July 13, 2004. The purpose of the study was to determine the current capabilities of a locally developed UPM-APSB's AISA airborne hyperspectral remote sensing applications to operationally map and monitor the islands in Sabah and observe the status of their coastal waters and reef environment. The airborne data were pre-processed on-board a fixed wing aircraft and later processed using spectral end member during the advance digital processing techniques. AISA AeroMAP™ research products showed that the current technology did a good job of conveying spatial variability of the parameters being tested such as human activities and impact, presence of fishing boats, coral reef, near shore shallow bathymetry, shoreline features and coastal vegetation.

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Journal of Geography and Geology ISSN 1916-9779(Print) ISSN 1916-9787 (Online)

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