APPLICATION OF WATER COLUMN CORRECTION IN BENTHIC HABITAT MAPPING

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APPLICATION OF WATER COLUMN CORRECTION IN BENTHIC HABITAT MAPPING

By

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Research Report submitted in partial fulfillment of
the requirements for the degree of
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Department of Marine Science
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Final Research Project Report Declaration and Verification Form

DEPARTMENT OF MARINE SCIENCE
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
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DECLARATION AND VERIFICATION REPORT
RESEARCH PROJECT I AND II

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ABSTRACT

QuickBird satellite can capture image of large area without contact with it. The image needs to be process to have better accuracy. The main objective of this project is focused on the differences between image that had undergone water column correction and without water column correction process. The images used are from QuickBird satellite. The software I used to process the image is IDRISI Andes. Image processing of Lang Tengah island image included geometric correction, atmospheric correction, masking, water column correction, supervised correction and lastly accuracy assessment. The algorithm used for atmospheric correction is ATCOR 2 that used on flat terrain. Masking in this project is to remove the unwanted area that is the land and consider the sea as wanted area. Water column correction used in this project is Lyzenga method to remove the effect of absorption and scattering caused by water. Method used for supervised classification is Minimum Distance which was applied to the images that the water column had been corrected and uncorrected. Accuracy assessment was done to the images to find out which image has better accuracy. To complete the supervised classification and accuracy assessment, in-situ data that is bottom types are required. Sampling activity was done to get the in-situ data. The result of the project show that images with water column correction is more accurate than images without water column correction. Band 1 (blue band) image has better accuracy compared to band 2 (green band) and band 3 (red band) image.

PENGGUNAAN PEMBETULAN AIR COLUM DALAM PEMETAAN PENGHUNIAN BENTHIC

ABSTRAK

QuickBird satelit boleh memberi maklumat tentang sesuatu kawasan yang luas tanpa menyentuhnya. Gambar tersebut perlu diproses untuk meningkatkan ketepatannya. Objektif utama projek ini ialah untuk membandingkan gambar satelit yang menjalankan 'water column correction' dan gambar yang tidak menjalankan 'water column correction'. Gambar yang digunakan dalam projek ini ialah dari Quickbird satelit. IDRISI Andes digunakan untuk memproses gambar tersebut. Langkah untuk memproses gambar satelit ialah 'geometric correction', 'atmospheric correction', 'masking', 'water column correction', 'supervised classification' dan 'accuracy assessment'. Algoritehm yang digunakan untuk 'atmospheric correction' ialah ATCOR 2 (topografi rata). 'Masking' dalam projek adalah mengeluarkan kawasan yang tidak diperlukan iaitu darat dan memberi tumpuan kepada kawasan yang diingini iaitu laut. 'Water column correction' yang saya gunakan dalam projek ini ialah 'Lyzenga method' untuk membuang kesan penyerapan dan pembantulan yang disebabkan oleh air. Cara 'supervised classification' yang digunakan pada gambar satelit yang menjalankan 'water column correction' dan gambar satelit yang tidak menjalankan 'water column correction' ialah Minimum Distance. Fungsi 'accuracy assessment' ialah untuk membanding gambar satelit manakah yang mempunyai ketepatan yang paling tinggi. Untuk menjalankan proses 'supervised classification' dan 'accuracy assessment', in-situ data iaitu jenis bottom diperlukan. In-

situ data boleh didapati melalui pengambilan sampel. Keputusan menunjukkan gambar satelit yang menjalankan 'water column correction' mempunyai ketepatan yang lebih tinggi daripada gambar satelit yang tidak menjalankan 'water column correction'. Selain itu, Gambar satelit jalur 1 (jalur biru) mempunyai ketepatan yang lebih tinggi berbanding dengan gambar satelit jalur 2 (jalur hijau) dan jalur 3 (jalur merah).