

## **Object-based classification of QuickBird image and low point density LIDAR for tropical trees and shrubs mapping**

### **ABSTRACT**

This paper assessed the performance of object-based supervised support vector machine (SVM) and rule-based techniques in classifying tropical vegetated floodplain using 0.6m QuickBird image and LIDAR dataset of 1.4 points per square meter (PPSM). This is particularly significant in hydraulic modelling in which vegetation roughness is a big uncertainty and largely relies on land cover classification. The supervised classification resulted in 79.40% overall accuracy whilst the results improved by 8% with rule-based classification. 40 sample plots of trees and shrubs were measured to be compared to obtain the best classification results. The results showed a linear relationship between tree diameters and NDVI with a high Pearson correlation of 0.76 and coefficient of determination ( $r^2$ ) of 0.58. The canopy areas of shrubs were found to be representative spatially with an even higher Pearson correlation of 0.98 and  $r^2$  of 0.95. The study concluded that the fusion of QuickBird image and low point density LIDAR in rule-based classification together with field data were useful in quantifying tropical trees and shrubs.

**Keyword:** Low point density LIDAR; QuickBird; OBIA; Rule-based classification; Tropical vegetated floodplain; Vegetation parameter