

## **Quantitative validation assessment on shorelines extracted from image classification techniques of medium resolution satellite images based on change analysis**

### **ABSTRACT**

Shoreline extraction provides the boundary information of land and water, which helps monitor erosions or accretions of coastal zones. Such monitoring can be performed by using satellite images rather than by using traditional ground survey. To date, shorelines can be extracted from satellite images with a high degree of accuracy by using satellite image classification techniques based on machine learning, which helps identify the land and water classes of shorelines. In this study, the results of extracted shorelines of 11 classifiers were validated by using a reference shoreline provided by the local authority. Specifically, the validation assessment was performed using Mean Shoreline Change method to examine the differences between the extracted shorelines and the reference shoreline. The research findings showed that SVM Linear attained the highest number of transects and the lowest mean distances between extracted shorelines and reference shoreline, thus rendering it as the most effective image classification technique in demarcating land and water classes. Furthermore, the findings showed that the accuracy of the extracted shoreline was not directly proportional to the accuracy of the image classification, and smoothing operation using PAEK affected the quality of extracted shorelines. Moreover, the tolerance setting that was ten times the spatial resolution of satellite images was observed to be the most optimal configuration.

**Keyword:** Image classification; Medium resolution satellite image; Shoreline extraction; Validation assessment