

Comparison of Three Methods for Shorelines Extraction Based on Digital Image Processing of SPOT-4

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ABSTRACT

Indonesian legislation (Undang - Undang) No. 22, 1999, mentioned that shoreline can be used to determine the boundaries, either countries or within the country, for example to determine the boundaries of the province, district and city. Shoreline is an imaginary line separating sea and land. Shoreline extraction done using Satellite Pour l' Observation de la Terre-4 (SPOT-4) images. SPOT-4 image is an optical satellite image with 20 meters of spatial resolution. SPOT-4 has four bands consist of green, red, near infrared (NIR) and middle infrared (SWIR) wavelength.

The purpose of this study was to compare the shoreline extraction based on the digital image processing of SPOT-4 using three methods. Those methods were ratio of infrared and green band, Normalized Difference Vegetation Index (NDVI) and single band (band infrared). Those methods were applied on both clear (no-cloudy) and cloudy (10% cloud) SPOT-4 images. The calculation of accuracy was done by comparing the shoreline result of processing with RBI map that has classified into sea and land. The research location was in the Klara beach, Padang Cermin district in Lampung. The location was chosen because there is no big difference between shoreline on SPOT-4 image and on RBI map. Thus it is assumed that the difference in shoreline results of processing with RBI map occurred due to effect of digital processing.

The accuracy of shoreline result of clear SPOT-4 image processing for the ratio infrared and green method are 97.99%, NDVI method are 98.73% and single band method are 98.47%. However, shoreline result of cloudy SPOT-4 image processing give an accuracy of ratio infrared and green method are 98.07%, NDVI method are 96.67% and single band method has accuracy 97.03%. Thus those three methods give good accuracy for clear SPOT-4 image, but cloudy SPOT-4 image give an influence for accuracy of processing result from NDVI and single method.

Key words: *digital processing, shoreline, SPOT-4 image, ratio method, NDVI, single band infrared*