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Comparison of support vector machine and object based classification methods for coastline detection

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Abstract. Detection of coastline is an important procedure for management of coastal zones. According to the International Geographic Data Committee (IGDC), coastlines are one of the most important environmental heritages on the earth ' s surface. In the coastal areas, main challenge is to understand the present coastline dynamics and to predict its future developments. Therefore the coastal zone monitoring is an essential process for sustainable coastal management and environmental protection. Shoreline extraction is an important issue for coastal zone monitoring.

In this study, efficiency of two different methods for detection of coastline features from satellite images, which cover Lakeland region of Turkey, has been tested. Firstly, object based classification method (OBC) has been used to extract shoreline automatically. Developed process based rule set extracts coastline as a vector file from satellite imagery. As a second method, support vector machine (SVM) algorithm has been used to extract coastline. For the application of these two different methods, Landsat 8 data have been used. The results of these two automatic coastline extraction methods were compared with the results derived from manual digitization process. Random control points over the coastline were used in the evaluation. Results showed that both methods have a sub-pixel accuracy to detect coastline features from Landsat 8 imagery.

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