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The Feasibility of Bio-Hydrogeomorphic Features for Aras River by Using Satellite Images

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Introduction

The use of remote sensing techniques to assess water resources started in the 60's with the availability of the first digital satellite images. Initially, it was the presence of chlorophyll-a in the water and the water surface temperature that motivated the use of such techniques and also motivated the study of optical properties of water components to determine if these water quality related parameters could be estimated remotely. It is the relation between the spectral behavior of water and the presence of optically active components that make remote sensing and digital image processing valuable tools to monitor the quality of water. The fact that water has a very distinctive spectral signature, characterized mostly by its strong absorption in the near and shortwave infrared makes it easily detectable using these wavelengths. Recent research in many parts of the world involving water quality have made use of data from Landsat-8. Understanding the factors bio-Hydrogeomorphic and its work in the recognition and management of the environment in the river Aras River, is very important. These factors can be pointed to the growth of algae. Nowadays Eutrophication considered as an important global issue that affects the aquatic ecosystem and balance it to come together. This phenomenon is caused by the growth of algae in a water bed that one of the causes of the excessive use of fertilizers and entry into the water. So, monitoring and observation of this phenomenon is necessary to deal and manage it. In this regard remote sensing technology as a new method, the necessary means to identify the emergence and development of river algae and modeling of spatial and temporal variations provide them.

Methods

The current research developed based on the remote sensing timeseries image processing methods. It is well known that remote sensing technology allows accurate identification of areas covered with temporal images algae and provides growth and development.

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Feasibility study aimed to identify the areas covered by algae within the Aras River is considered as the most important border river. In this study, Landsat 8 satellite imagery has been used. The process is based on the techniques of image processing and identification of algae.

Results

Results of this study indicated the efficiency of remote sensing for bio-hydrogeomorphic mapping. Based on the results, due to the similarity of spectral reflectance of vegetation and chlorophyll algae, the band 4 and 5 and NDVI were used and the output of the index as input fan supervised classification maximum likelihood method was applied in the assessment of classification accuracy, overall accuracy 73 % Kappa coefficient was 0.82. Based on the results the field campaign lasted about six hours which probably caused problems for the surface temperature that responds very quickly to the sun elevation.

Conclusion

The research indicated that although the remaining parameters in image processing for Alga mapping are considered more stable, they are still affected by the changing conditions of temperature and illumination. This means that conducting faster sampling near the image acquisition time could potentially improve these models as well. Future campaigns will try to reduce these effects by using two teams instead of one. From the methodological perspective, we conclude that the proposed method can be applied for similar studies efficiency and results will also provide critical information for decisionmakers and authorities.

Keywords: Remote Sensing, Landsat 8, Satellite Images Processing, Detection of Algae's, River of Aras

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