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Comparing pixel-based classification methods to detect land use changes in dry land ecosystems, based on time series of satellite images

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Actual issue of remote sensing data analysis is to design highly automated algorithms. In general case, full automation cannot be achieved due to complexity of most computational and analysis techniques. Nevertheless, automatic computations can be implemented in some special cases (e.g., when producing some standardized analytic products). In our study, we investigate the capabilities of automatic analysis of the land cover change in Eastern Iran, where the dry lands presented in significant amount and high risk of desertification exists. The study has a regional scale. We used automatic unsupervised classification technique to detect and monitor the desertification at the Sistan Basin in Iran. Currently, we have designed the automatic computational algorithm and evaluated its accuracy. We used the Landsat satellite imagery of years 1990s, 2000s, and 2010s. To produce the benchmark maps of the land cover. We conducted the supervised classification with training samples, based on our previous field observations on this area. In order to adopt unsupervised classification technique to the study context (i.e., to the features of arid lands), we used the Soil Adjusted Vegetation Index (SAVI) maps. These maps were used as the additional input data for unsupervised classification. As a result, the unsupervised classification produced three basic classes of land cover (vegetation cover, bare land and water bodies) in automatic mode, with appropriate accuracy. Produced land cover maps showed intensive decrease in vegetated areas, loss of water, and arid lands increased during the study period.

Biography

Kharazmi R received his BSc degree in Natural Resources from the University of Zabol, Zabol, Iran, in 2009, and MSc degree in Information System and Technology from the Moscow State University of Geodesy and Cartography (MIIGAiK), Russia, in JUN 2014. Currently, he is a PhD candidate of Geoinformatics at St. Petersburg State University (SPBU) from Sep. 2014.

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