

Oasis Dynamics Change and its Influence on Landscape Pattern Using MultiSource Data on a Regional Scale – A Case Study in the Tafilalet Plain, Morocco

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In Morocco, the huge variability of climate has constantly been a main challenge into the social and economic development of the country. The impact of desertification and oasis change and its interaction with landscape pattern have been regarded as an important content of regional environmental change research in arid areas. In this paper, the Tafilalet Plain in Morocco was selected as the research region and a quantitative method for desertification assessment was developed by using Landsat TM/ETM+/OLI, and Sentinel 1, data on a regional scale. In this method, vegetation, texture and land surface albedo indexes were selected as assessment indicators of desertification to represent land surface conditions from vegetation biomass, landscape pattern and micrometeorology. Based on considering the effects of vegetation type and time of images acquired on assessment indicators, assessing rule sets were built and a decision tree approach was used to assess desertification of Tafilalet Plain during the period of 1984a–2015a. By analyzing the causes of desertification processes, it was found that climate change could benefit for the reversion of desertification from 1984 to 1997 at a regional scale and human activities during a dry climate might explain the expansion of desertification in this period; however human conservation activities were the main driving factor that induced the reversion of desertification from 1997 to 2015.