Detecting vegetation stress in coastal Gabes oases using Hyperion hyperspectral sensor

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In the last decades, the environmental changes due to the human activities are the main causes of disturbance of oasian agro-systems. Gabes region, in the southeastern of Tunisia, is characterized by unique maritime oases in Mediterranean basin. Unfortunately these oases are sensitive areas due to a harsh competition for land and water between different user groups (urban, industry, agriculture). An industrial complex is now located in center of this region, cultivation practices have shifted from a traditional multi-layer plant association system and moreover the Gabes city itself is expanding in the very core of oases. The oases of Gabes are transformed into city oases; they undergo multiform interactions whose amplify their environmental dynamic. A proper management of this environment should be based on a fine cartography of land use change and remote sensing plays a major role in this issue. Although Landsat long time series archive is a valuable tool it gets some limitations due to TM sensor spectral definition. Both sparse vegetation cover area and crop stress and disease are difficult to assess. Our study deals on potential improvement of hyperspectral sensor to overcome these limitations. EO1/Hyperion data on seven different dates on 2009 and 2010 have been retrieved from NASA Web-site. From this dataset dataset, an intercomparison of various hyperspectral based indices has been carried out with a focus on information complimentary from normalized vegetation index. On this basis the most efficient indices are the anthocyanin reflectance index (ARI2), the disease water stress index (DWSI) and the photochemical reflectance index (PRI). They allow an analysis of vegetation status beyond a global greenness assessment.