

An assessment of rapid development in Dubai (UAE) between 1999 and 2008 using spectral information divergence and Landsat imagery

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Abstract. The emirate of Dubai is the most populous and most developed of the seven emirates that comprise the United Arab Emirates (UAE). During the last ten years the emirate has gradually shifted its economy from being petroleum-based to a focus on tourism and business. The city of Dubai has been growing rapidly; the population in 1999 was 862,000 inhabitants, a figure that doubled in ten years to 1.6 million by the end of 2008. This increase has been accompanied by ambitious land reclamation projects. In this paper we present remote sensing in general as an important tool to monitor development in Dubai and spectral information divergence in particular as an effective algorithm to quantify the amount of coastal alteration between 1999 and 2008. We used two Landsat ETM+ images from the same season in both years. Both images underwent classification in ENVI using the spectral information divergence algorithm and further analysis for the quantification of coastal urbanization, which also includes near-shore land reclamation, was carried out in ArcGIS. The results have shown a 40% change in the landscape of the study area over 10 years attributed to considerable increase in near-offshore development and onshore urbanization.

Keywords: landsat, Dubai, spectral information divergence.

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