



## Use of SPOT 5 and IKONOS imagery for mapping biocenoses in a Tunisian Coastal Lagoon (Mediterranean Sea)

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### ABSTRACT

Mapping marine biocenoses is an efficient method for providing useful data for the management and conservation of Mediterranean lagoons. Fused images from two satellites, SPOT 5 and IKONOS, were tested as management tools for identifying specific ecosystems in the El Bibane lagoon, situated in southern Tunisia near the Libyan border. The objectives of this study were to provide a precise map of the entire El Bibane lagoon using fused images from SPOT 5 and to compare fused images from SPOT 5 and IKONOS over a test-area. After applying a supervised classification, pixels are automatically classified in four classes: low seagrass cover, high seagrass cover, superficial mobile sediments and deep mobile sediments. The maps of the lagoon revealed and confirmed an extremely wide distribution of seagrass meadows within the lagoon (essentially *Cymodocea nodosa*; 19 546 ha) and a large area of mobile sediments more or less parallel to the shore (3 697 ha). A direct comparison of overall accuracy between SPOT 5 over the entire area, SPOT 5 over the test-area and IKONOS over the test-area revealed that these tools provided accurate mapping of the lagoon environment (83.25%, 85.91% and 73.41% accuracy, respectively). The SPOT 5 images provided greater overall accuracy than the IKONOS image, but did not take into account the heterogeneous spatial structure of the seagrasses and sediments present in the lagoon environment. Although IKONOS imagery provided lower overall accuracy than SPOT 5, it proved a very useful tool for the mapping of heterogeneous structures as it enabled the patchiness of formations to be better taken into account. The use of SPOT 5 and IKONOS fused images appears to be very promising for completing the mapping of lagoons in other regions and countries of the Mediterranean Sea.

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