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Mapping Kneiss islands environment using hyperspectral data

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On the eve of PRISMA and EnMap lauching, the EO1/Hyperion data gain new interest. Despite a limited number of available views this satellite sensor offer a practical testbed to assess the improvements expected from hyperspectral remote sensing. This presentation focuses on coastal ecosystems mapping through a Kneiss islands study. These islands, located on the tunisian coast between Sfax and Gabes, are close from the coast and are surrounded by shallow waters with a significant tidal effect. Natural conditions associated with a low level of human activities made this area a migratory bird sanctuary and therefore led to the classification as a protected Ramsar zone. However the sustainability of this ecosystem in front of environmental and land use changes is an open issue and the protected area monitoring requires an accurate and repetitive mapping.

On a previous study the retrieval of the main coastal water parameters were extracted from Modis imagery. The chlorophyll content was estimated by semi-empirical algorithms OC3 and OC5 and these estimations were compared with in-situ measurements. As some of these measurements are close from EO1/Hyperion this study has been extended to the hyperspectral case. Two classes of hyperspectral indices are computed. The first indices are directly derived from Modis ones but on narrower bands. The second classe of indices are computed by algorithms close from the spectral optimization approach as supported by the HOPE processing software. Although the results are in some extents inconclusive due to small size of the processed sample they shows the importance of data quality for a proper exploitation of hyperspectral imagery. An alternative way should be to investigate for hyperspectral methods less sensitive to radiometric of atmospheric perturbations.