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Classification of submersed aquatic vegetation of the Venice lagoon using MIVIS airborne data

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Abstract

In July 2001 an aerial survey with MIVIS (Multispectral Infrared and Visible Spectrometer) hyperspectral sensor and an in situ survey campaign were performed on Venice lagoon to map benthic macro-algae and sea phanerogams distribution. On MIVIS VIS spectral range images, training areas for benthic macro-algae and sea phanerogams have been selected by using sea truth data collected by CNR-ISMAR from in situ campaign and periodic area surveys used in the lagoon by the local authorities. The derived spectral signature has been used to classify the area in order to produce the maps of the pure and mixture submersed vegetation population. The algorithm applied to the data is based on the Subpixel Spectral Analytical Process (SSAP) method. The method assumes that the spectrum of a single pixel is composed of a fraction of the material of interest while the remainder of the observed spectra contains background materials. In terms of recognition processes the produced maps present a very good agreement with the sea truth data even though the fraction material expressed in the maps does not represent a quantitative estimation of the material of interest.

Keywords

MIVIS;benthic macro-algae;sea phanerogams;subpixel classification

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