

Classification of intertidal sediments based on biophysical characteristics obtained by imaging spectroscopy

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The ability of remote sensing for defining the character of intertidal sediments is increasingly recognized. Hyperspectral airborne remote sensing is the main issue in this paper, and the subject areas are two estuarine intertidal flats in the North Sea and Westerschelde, “De IJzermonding” and “Molenplaat”. Hyperspectral Imagery was obtained in 2005 by the Airborne Hyperspectral Sensor (AHS). Furthermore, field data were acquired for both sites in a time frame close to each overflight period. The field work consisted of sediment sampling along with GPS measurements, digital photography, and in-situ reflectance measurements. Sediment samples were analyzed for grain size distribution, pigment content, and, for the IJzermonding samples, water content and organic matter. These available field data were used either for training the classification algorithm or for validation purposes. Both supervised and unsupervised classification techniques were used. The supervised classification followed a binary classification approach based on feature selection and linear discriminant analysis. In addition, AHS images were classified using unsupervised techniques to reveal features in regions where there was no field sampling. Maps of different sediment aspects were obtained with relatively high classification accuracies, thus allowing comparison with campaigns of previous years.