

Operational remote sensing mapping of Estuarine suspended sediment concentrations (ORMES)

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The aim of the ORMES project is to develop a simple and robust procedure for near surface sediment concentration mapping from remote sensing data, both airborne and satellite borne. IMDC, the private partner in the ORMES project, prepares specifications and recommendations of techniques, equipment and methods for any dredging project. IMDC requires information on the spatial variation of turbidity for among others the optimization of the dredging locations and dumping sites and the better planning of new harbor locations.

Here, we will present the results of a hyperspectral airborne campaign at the Lower Sea Scheldt with the AHS Advanced Hyperspectral Sensor (SenSytech Inc). The airborne data were acquired at different stages during the tidal cycle. Simultaneously with the airborne campaign ground truth data was collected. Three survey vessels were used at different stretches of the Lower Sea Scheldt to include some spatial variability. Several measurements were done on board of each vessel on predetermined locations at the time of airplane crossing over the study area. Surface water samples were collected for analyzing total suspended matter concentration, optical reflectance measurements were carried out and a turbidity sensor continuously measured turbidity in the surface water layer.

Using these field data and the high resolution airborne data, a reliable semi-empirical algorithm has been developed to derive near-surface suspended matter maps in an operational way. The produced TSM maps showed good agreement with known variations of the suspended sediment content over the tidal cycle: maximum turbidity around high water and gradual settling of the sediment in the succeeding slack water. A resuspension of sediment takes place at the onset of the ebb flow stage, especially at the bend-related shoals. The cross-river differences in TSM matched well the variation measured at previous field campaigns.