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Integrated approach to monitor water dynamics with drones

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Remote sensing has been used for more than 20 years to estimate water quality in the open ocean and study the evolution of vegetation on land. More recently big improvements have been made to extend these practices to coastal and inland waters, opening new monitoring opportunities, eg. monitoring the impact of dredging activities on the aquatic environment. While satellite sensors can provide complete coverage and historical information of the study area, they are limited in their temporal revisit time and spatial resolution. Therefore, deployment of drones can create an added value and in combination with satellite information increase insights in the dynamics and actors of coastal and aquatic systems. Drones have the advantages of monitoring at high spatial detail (cm scale), with high frequency and are flexible. One of the important water quality parameters is the suspended sediment concentration. However, retrieving sediment concentrations from unmanned systems is a challenging task.

The sediment dynamics in the port of Breskens, the Netherlands, were investigated by combining information retrieved from different data sources: satellite, drone and in-situ data were collected, analysed and inserted in sediment models. As such, historical (satellite), near-real time (drone) and predictive (sediment models) information, integrated in a spatial data infrastructure, allow to perform data analysis and can support decision makers.