

# Water and sediment circulation in the ports of Zeebrugge and Ostend

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A modelling tool that simulates pollutant movements in the ports of Zeebrugge and Ostend is needed to support the development of innovative measurement techniques based on passive sampling to measure the good environmental status for descriptor 8 of the marine strategy framework directive (MSFD). The polluting substances need to be followed when dissolved in the water and when attached to the sediment. The sediments are suspended in the water or located at the sea floor. A new module will be developed to describe the behaviour of the pollutants, the displacements in the different phases are covered with a Eulerian technique and the exchange by using partitioning coefficients. To describe the water and sediment circulation the hydrodynamic module of COHERENS, a coastal shelf sea modeling system was used. Here, the water circulation and sediment movements of Ostend and Zeebrugge are calculated for 2016. The gyre often observed in the inner port of Zeebrugge is well captured by the model and matches the observations well. A first exploration of simulated and observed sediments was performed and here as well the results are promising. The development of a pollutant tool is well on its way.

Keywords: hydrodynamic modeling; sediment modeling; North Sea; pollutant movements