

Assessment of the ecological implications when installing an SRA between Belgium and the Netherlands: An oceanographic pilot study

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In February 2004, the International Maritime Organisation (IMO) adopted by consensus the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM). The BWM requires all ships to implement a ballast water management plan by 2024. In order to anticipate on - and react to - this future situation, several governments around the world have started analyses to determine the viability of a so-called Same Risk Area (SRA). In this SRA, it is not necessary to treat the ballast water and it can be loaded and unloaded anywhere within the SRA. Ministries within the Netherlands and Belgium have taken the initiative to analyse the viability of an SRA for certain parts of their territory. The aim of this work was to investigate the possible ecological implications when such a Same Risk Area was to be installed containing the ports of Antwerp, Zeebrugge, Vlissingen and Rotterdam. The ecological impact was assessed by looking at the available biological data (biological study) in combination with hydrodynamic simulations (oceanographic study) of the sea current circulation patterns for the year 2011 in the studied region. This work presents the results of the oceanographic study.

The hydrodynamic simulation revealed that connectivity varies greatly with season and behaviour. The modelling part of the study only demonstrated a potential direct, strong and natural connection in the area of the river mouth of the Scheldt containing the ports of Vlissingen and Zeebrugge, but not the port of Antwerp. Antwerp, the only non-marine harbour, potentially showed a low unilateral connection with the other ports during the year 2011, species would be able to move from Antwerp to the other ports, but not the other way around. This oceanographic study suggest that water ballast exchange may at least increase the spreading of species or may create new connections at the scale of the studied area. The main uncertainties of this study are the absence of inter-annual variability assessment and the simplified behaviour of species in the model. Results from the oceanographic and biological studies seem to re-enforce each other.

Keywords: Ballast water management convention; Oceanographic study; Invasive species; Hydrodynamic model; Individual based model