Comparative estuary study

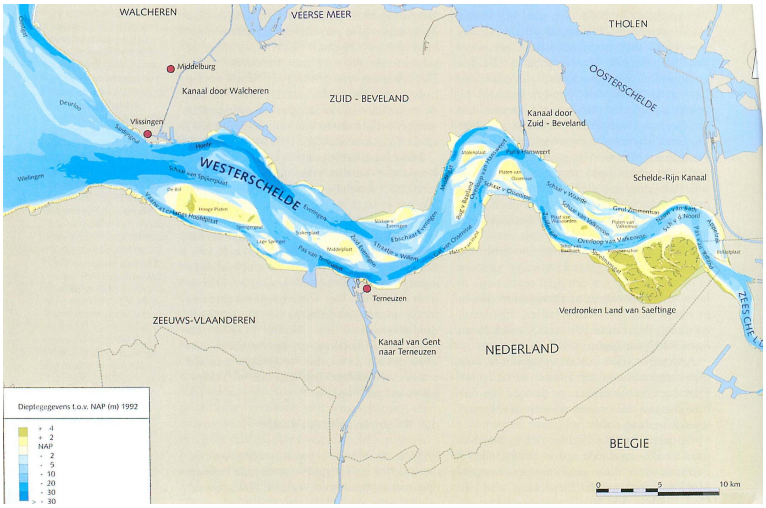
Background

From the onset of estuarine research, a large amount effort has been put into the prediction of species distribution and abundance. The abiotic factors governing the habitats that delimit the occurrences of specific species have been studied intensively. The need to explain and predict species distribution and abundance in the Western Scheldt and other estuaries has increased with the intensification of their use and the growing appreciation of their natural values. One way of improving the working knowledge of the Western Scheldt estuary is comparing a number of morphodynamic and ecological parameters in different estuaries. The comparison of estuaries addresses the following research question: What are the limiting factors for the ecological development of the Western Scheldt? This research question deals with the carrying capacity of the Western Scheldt. Carrying capacity can be defined on an aggregated scale as the total annual productivity of the estuary, and can be specified for animal groups or even species. If the productivity of an estuary is high compared to other estuaries, its carrying capacity is large and a high abundance of animals may be expected.

Objective

The study started in 2006 with the development of a Terms of Reference for a total Comparative Estuary Study. A pilot showed the possibilities for such a study. The objective for 2007 was to collect data on selected estuaries on abiotic parameters (morphological, hydrodynamical and sediment parameters) and two biotic parameters, namely the microphytobenthos production and macrobenthos expressed in biomass, density and number of species. The objective was to start the collection of data and to submit a selection of data to a preliminary comparison.

Type of project	comparative study
Location	Scheldt and other estuaries, e.g. Elbe
Partners	Grontmij|AquaSense and University of Antwerp
Client	Rijkswaterstaat, The Netherlands
Period	2006-2007



Project description

Alkyon
Hydraulic Consultancy & Research

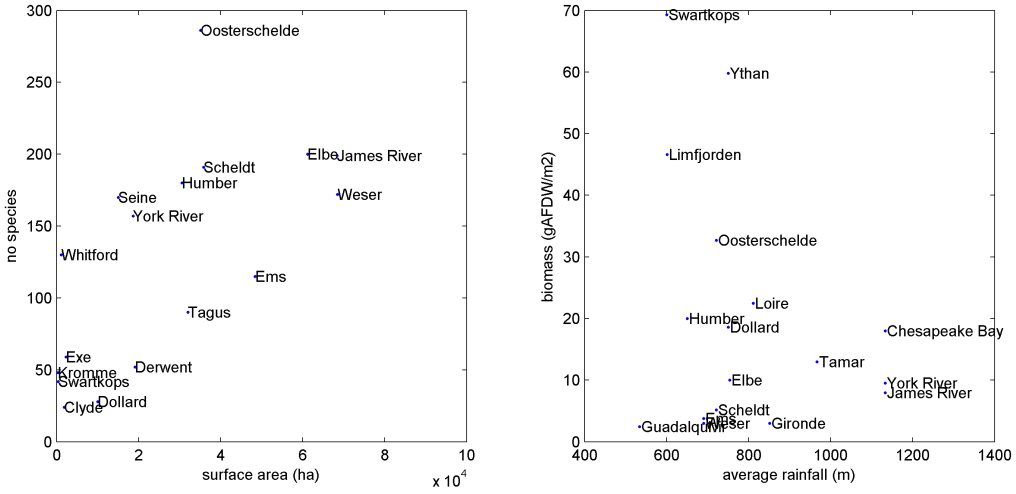
A2015

Study approach

The study started with the selection of the morphodynamic parameters to be studied. The selecting was based on the importance of these parameters to microphytobenthos production and macrobenthos, as found in scientific literature.
Information was collected for the Scheldt estuary and 31 other estuaries in Europe, North America, Canada and South Africa. Information was sought on the Internet, in scientific literature and by approaching persons or institutes knowing to study an estuary.

Results

Parameters on salinity were not easy to collect, but almost every estuary had information on rainfall and river discharge, which influences salinity. Therefore, a number of correlations could be plotted using these indirect parameters. Morphological parameters were moderately available. In this study, information was collected successfully on average depth, volume and surface area of intertidal flats. Next to this, two parameters describing the hypsometry were successfully developed. System-averaged sediment properties were scarce. Average air temperature is a useful, available and homogeneous parameter. Data on system-averaged primary microphytobenthic production are available for several estuaries. It was further possible to collect data on macrobenthic parameters, although there is also a high level of bias.
Plotting and analysing the relationship between abiotic and biotic parameters revealed interesting information, which will be used to better understand the carrying capacity of the Scheldt estuary.



Information

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