The Western Scheldt: an analysis of the water level

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The Western Scheldt is one of the few natural estuaries left in Western Europe. Besides the ecological value, the estuary also has an important economical function, in particular as a shipping route for container ships to the harbors of Antwerp and Flushing.

The Western Scheldt is monitored extensively, with emphasis on parameters of morphological and fysical changes that may have consequences for the ecological functions of the water body. For this reason it is important to carefully analyse and evaluate these parameters.
In 2002 a pilot study was started to detect possible changes in the physical and morphological behaviour of the Western Scheldt estuary over the past 30 years. The parameter 'water level' has been the subject of the first analyses since this parameter is expected to have a high potential to detect changes and is frequently monitored on many locations.

The analysis was based on hourly values of the water level in the period between 1971-2001. Analysis of the yearly averaged amplitude of the most important frequency components resulted in some remarkable results. For example, in the period 1986-1988 a disturbance in the normal repeating pattern of the M_2 component seems to occur. Furthermore, during the last five years the trend of the M_2 component in the eastern part of the estuary differs from the trend in the western part of the estuary and from expectation. These effects are possibly due to anthropogenic impact on the Western Scheldt system. More research has to be carried out to identify the causes of these observations.