This is the 21st newsletter of the *Knowledge Centre Manoeuvring in Shallow and Confined Water*, which aims to consolidate, extend and disseminate knowledge on the behaviour of ships in shallow and confined water. With the recent arrival of the MSC New York in the Berendrecht lock, a new record was set for the Port of Antwerp. In this newsletter, we present an item that discusses how the Knowledge Centre has been involved in accessibility studies for this large container ship using manoeuvring simulators. In a second item we discuss the development of an AIS data analysis tool with recent applications. Finally, we wish to point your attention to the first call for papers which was launched for the 4th MASHCON conference.

On 10 December 2014, the MSC New York arrived in the Port of Antwerp. With a length of 399 m and a beam of 54 m, it is the largest ship ever to pass through the Berendrecht lock, which in itself is the largest lock in the world at present. The arrival was preceded by a study executed at Flanders Hydraulics Research in cooperation with the Flemish pilotage and the Common Nautical Authority.

For this accessibility study, a sophisticated mathematical model was developed that takes both bank and lock effects into account. Simulations were then carried out in order to set the conditions for the trial run of 9 – 10 December 2014. The simulations were carried out for three scenarios, including lock entry and exit. A third scenario was the passing of the bend of Bath for the validation of the newly developed mathematical model. From these simulations, the maximum allowable wind conditions and required tug assistance were obtained.

This study illustrates how ship manoeuvring simulators driven by accurate mathematical models can play an important role in investigating and training new manoeuvres. Safe execution and completion in practice is the ultimate objective of these studies.
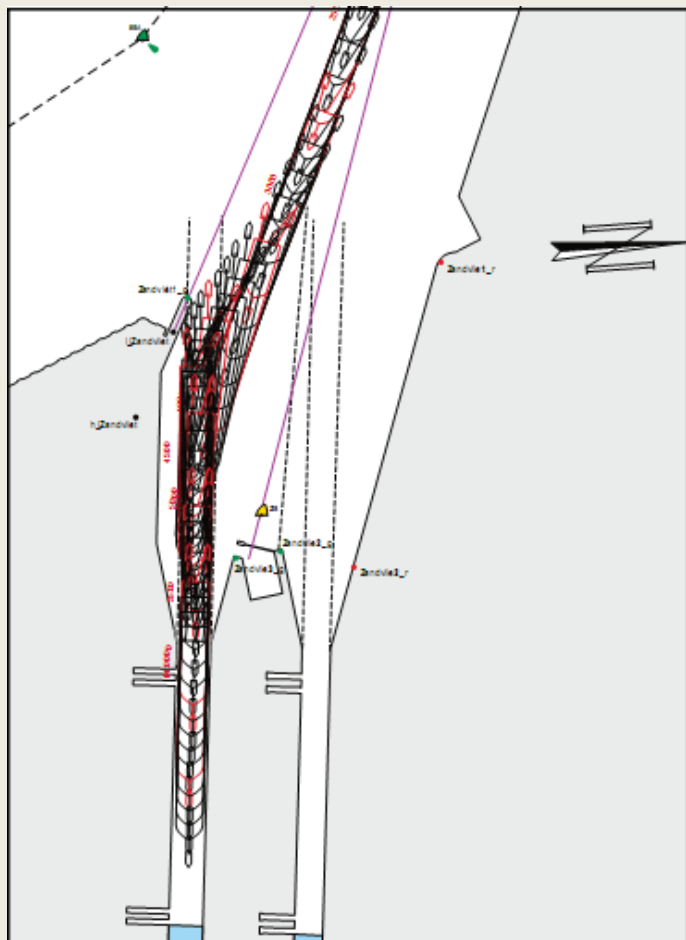
The Automatic Identification System (AIS) is a tracking system used by Vessel Traffic Services for identifying and locating ships. Each vessel exchanges data with other ships or base stations containing information on its position, course and speed. On the Western Scheldt and the North Sea AIS data are received by more than 10 base stations, which are logged in a central server operated by the Scheldt Radar Chain and each day approximately 0.5 GB of data are logged.

AIS data contain useful information that can for example be used to analyze shipping traffic for operational purposes or to analyze specific manoeuvres at particular locations. However, the mere size of the data files are a real challenge to work with. To this end, Flanders Hydraulics Research has developed a tool to analyze AIS information in a flexible and effective way. Voyage information
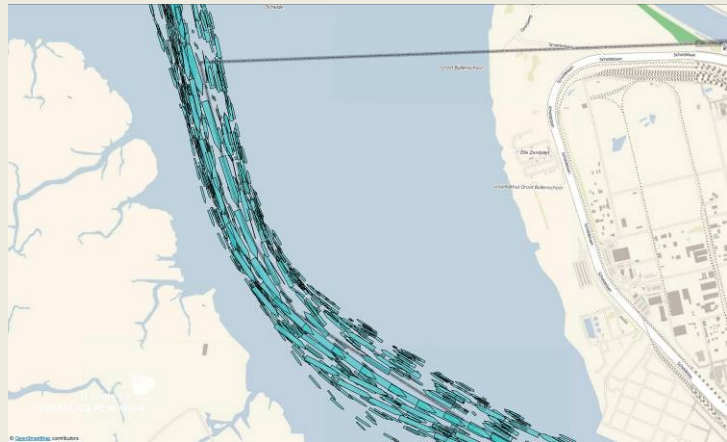
is structured based on the passing times of predefined entry lines. The data can then be filtered based on different parameters, such as ship characteristics (dimensions, type) or voyage characteristics (destination, in- or outbound sailing, draft, time). For visualisation purposes the tool also provides export options in different formats, which can be opened with Google Earth™ or other GIS-viewers.

On behalf of the Common Nautical Authority, the Knowledge Centre used the tool to analyze historic ship speeds for different ship types and destinations on the Western Scheldt. AIS data of 2012 and 2013 were supplied by the Scheldt Radar Chain. In order to reduce the dataset, the study was limited to vessels longer than 200 m and wider than 30 m.
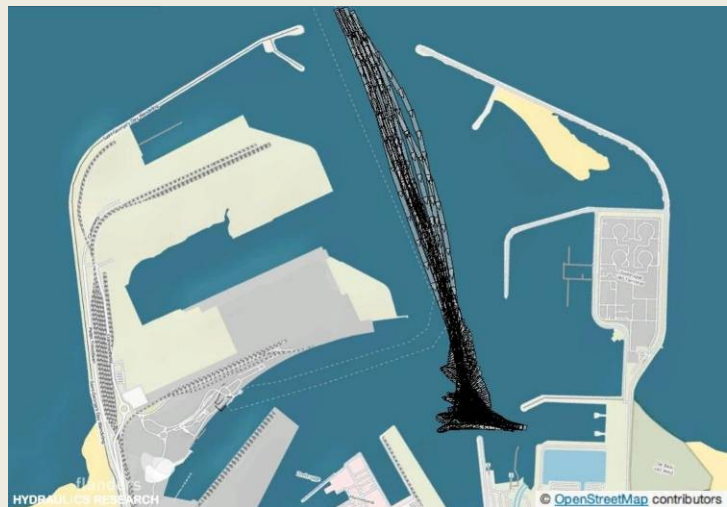
The study provided insight in the influence of ship type, draft, tidal conditions and operational boundary conditions on actual ship speed for inbound and outbound manoeuvres to Flushing Sloehaven and Antwerp.

The AIS data analysis tool was also applied for several other projects. One example is the analysis of passing distances and vessel speeds close to a wave gauge on the Western Scheldt in order to correlate water level changes with ship waves. Another example is a replay function of ship trajectories between two entry lines in the port of Zeebrugge in order to evaluate realistic manoeuvring speeds and rate of turn for a selection of vessels.

A first call for papers has now been launched for the 4th MASHCON conference, which will be held in Hamburg, Germany, on 23 – 25 May 2016. The conference will pay special attention to ship bottom interaction, but all topics relating to ship manoeuvring in shallow and confined water will be discussed.

Authors are invited to submit an abstract of 250 - 300 words to info@shallowwater.be before 30 June 2015. The official language of the conference is English and the abstracts will be reviewed by an international scientific committee. Once accepted, authors will be expected to write and submit a full paper, which will also be reviewed by the international scientific committee. More information can be found on the conference website.

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