Introduction

Some basic questions about the Scheldt estuary:
- The estuary is a way for storm surges to reach the hinterland. Are we protected enough?
- The estuary is almost entirely protected as NATURA 2000 area. Can port expansion on one of the crowdiest shipping ways go hand in hand with nature preservation?
- Larger and larger container ships are visiting the port of Antwerp. Has the estuary reached its limits yet?

Macoma balthica likes low dynamic intertidal areas. Its abundance decreases with decreasing salt levels.

Material and methods

Morphological scenario X:
- River discharges
- Water level sea
- Bathymetry

Telemac 2D model

- Salinity (t)
- Flow velocity (t)
- Depth (t)
- Water level (t)
- Sediment D50

Ecological model (Matlab)

Potential habitat map per benthos species

Morphology of system

Sedimentation/erosion map per scenario

Results and discussion

† Flood defense / Safety

Based on water level results of different scenarios the risk on flooding can be estimated.

† Port accessibility / Navigation channel

Based on sedimentation and erosion patterns for different scenarios the flow conditions in the navigation channel can be optimized to improve scouring on sills and decreasing maintenance dredging.

† Ecological value of the system

Increase or decrease of potential habitat for a specific morphological scenario up to species level. Difference maps between current situation and different scenarios are made to estimate evolution.

Conclusions

The morphology of the system that ensures a WIN-WIN-WIN situation between safety, accessibility and ecology can be found based on the specific needs of the system (dictated by its partners: ports, nature, humans). Living together means mutual respect for each other and accommodation space for each partner.