A new disposal strategy in the Schelde-estuary, conciliating port accessibility and nature

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Schelde-estuary

- Tides (range = 4 m)
- Salt water
- Sandy sediments
- Discharge (120 m³/s)
- Fresh water
- Muddy sediments
Future challenges

Flooding

Port accessibility

Nature

Sea level rise

Regime shift mud?

Antwerpen

C ~ 30 g/l
Long Term Vision

- In 2001 Dutch and Flemish government agreed on a LongTerm Vision for the Schelde-estuary, focussing on 3 principal functions:
  - Safety against flooding
  - Port accessibility
  - Ecology

- Importance of morphology: “preservation of physical characteristics is the cornerstone for management”
Development scheme 2010

- First phase of LTV: 26 projects to reach intermediate goals:
  - Execution of Actualised Sigmaplan (safety against flooding)
  - Deepening of navigation channel (accessibility)
  - Depoldering and reduced tidal areas (nature)
  - ...

- Stakeholder involvement (OAP – advising organisations)
- Parallel: disposal strategy could jeopardise physical characteristics ⇔ feasibility of new disposal strategy “Walsoorden pilot case” (Port of Antwerp Expert Team)

Until 2010
New disposal strategy Westerschelde

- Tide-independent draught up to 43' to port of Antwerp
- 7.7 Mm³ (capital) + ca. 10 Mm³/year (maintenance)
- Uncertainties on potential long term effects
- Three-stage rocket approach
3-step rocket approach: STAGE 1

- EIA most environmental friendly alternative: using dredged material to create new valuable areas for ecology (contributing to “estuarine restoration”) => mitigate possible effects

Dredged sediment used to create “soft” flow guiding structures:

1. Megadune: splitting flow
2. Sandspit: guiding flow

E.g. Walsoorden sandbar (type 1):

- Multiple channel system
- Self-eroding capacity sill
- Reduction of currents on sandbar
3-step rocket approach: STAGE 2

- Intensive monitoring (stability sediment, flow velocities, height of intertidal areas, grain size, ecology) and evaluation (bi-monthly meetings + annual evaluation of criteria)
3-step rocket approach: STAGE 3

- Stopping works (if necessary)
  ... but until now effects have been positive !!!

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Conclusions I

- **LTV 2030:**
  - Taking into account different estuarine functions

- **Development scheme 2010:**
  - Stakeholder involvement

- **Enlargement navigation channel:**
  - External expertise introducing new disposal strategy
  - Limitations of knowledge and tools ⇒ uncertainty
  - 3-stage rocket approach, with important role for monitoring and evaluation of results (pre-defined criteria)
Conclusions II

- Holistic approach based on system understanding
- Combining different ecosystem services and functions => striving for WIN-WIN-situations

=> MORPHOLOGICAL MANAGEMENT
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