

Enlargement of the navigation channel in the Scheldt estuary

Case study of a cross border EIA

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ESPOO seminar on biodiversity in EIA and SEA
2nd working group on EIA and SEA

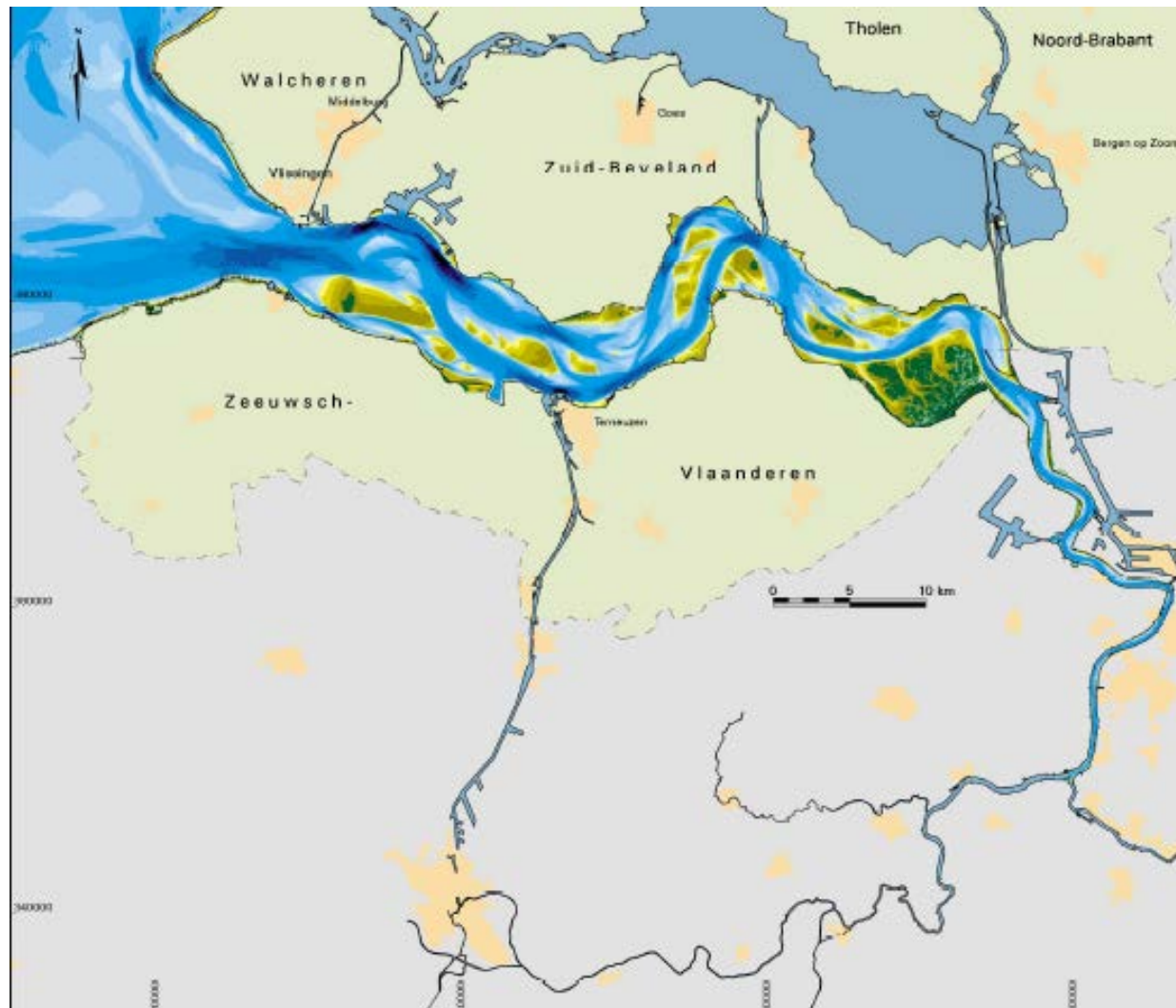
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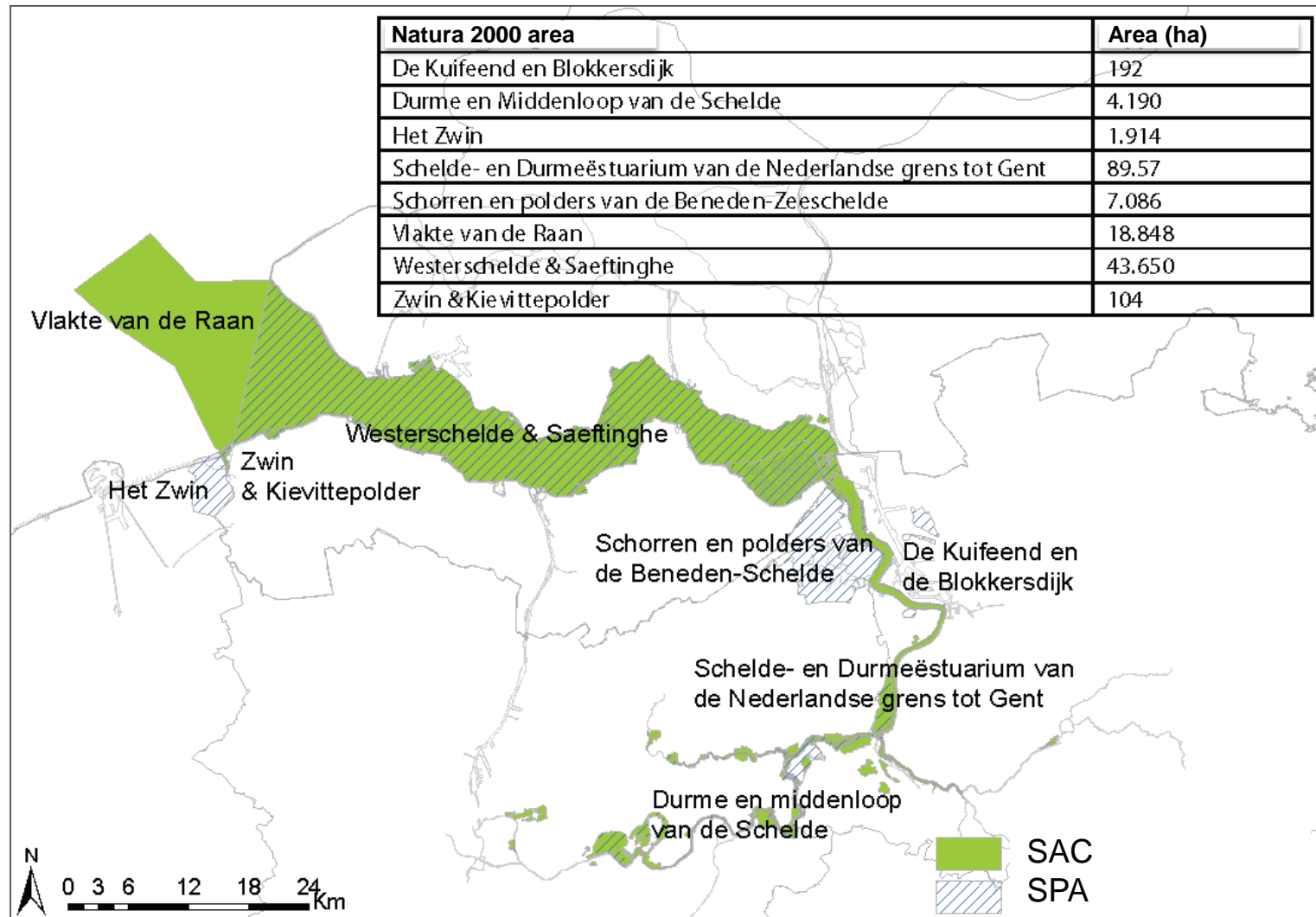
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Introduction

The Scheldt estuary



Natura 2000 in the Scheldt estuary



The port of Antwerp

Port of Antwerp in numbers (2012):

- 2nd largest European port
 - ✓ cargo: 184 134 516 tons
 - ✓ number of seagoing vessels: 14 556
 - ✓ number of inland vessels: 56 476
- 145 836 FTE jobs
- 19,2 billion € added value
 - ✓ 9,5% of Flemish GDP
 - ✓ 5,4% Belgian GDP



Cross-border management of the estuary

- 2001: Long Term Vision Scheldt estuary

- ✓ Safety against flooding
- ✓ Naturalness of the estuary
- ✓ Accessibility of ports



- 2005: Development Outline 2010 Scheldt estuary, containing several projects

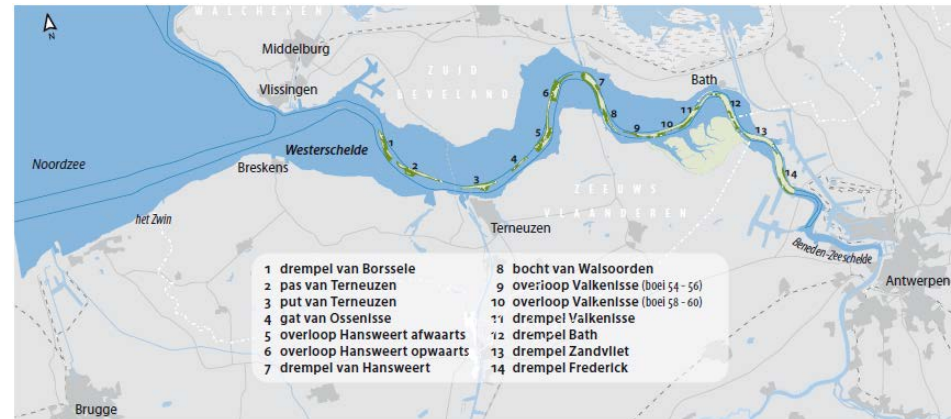
- ✓ Safety against flooding: risk assessment, actualisation Sigmoplan (Flanders), ...
- ✓ Naturalness of the estuary: controlled inundation areas, depoldering, ...
- ✓ Accessibility of ports: enlargement of the navigation channel, ...

- Joint fact-finding Flanders-Netherlands

- ✓ ProSes: common project office to coordinate all Scheldt projects from the LTV & DO 2010
- ✓ Working groups: Dutch & Flemish experts, follow-up of SEA, EIA & AA
- ✓ OAP: Flemish-Dutch stakeholder involvement

Project enlargement of navigation channel

- Economies of scale in container shipping industry
 - ✓ Number of container vessels with draft > 13m increases
 - ✓ Application of strict sailing schedules by shipping companies
- Enlargement of navigation channel
 - ✓ Deepening of sills
 - ✓ Widening of navigation channel locally
 - ✓ Capital dredging works ca. 14 Mm³, both on Dutch and Flemish territory
- Procedures environmental assessment
 - ✓ 2004: SEA + AA, social cost benefit analysis (DO 2010)
 - ✓ 2007: 1 coordinated Dutch-Flemish EIA + AA

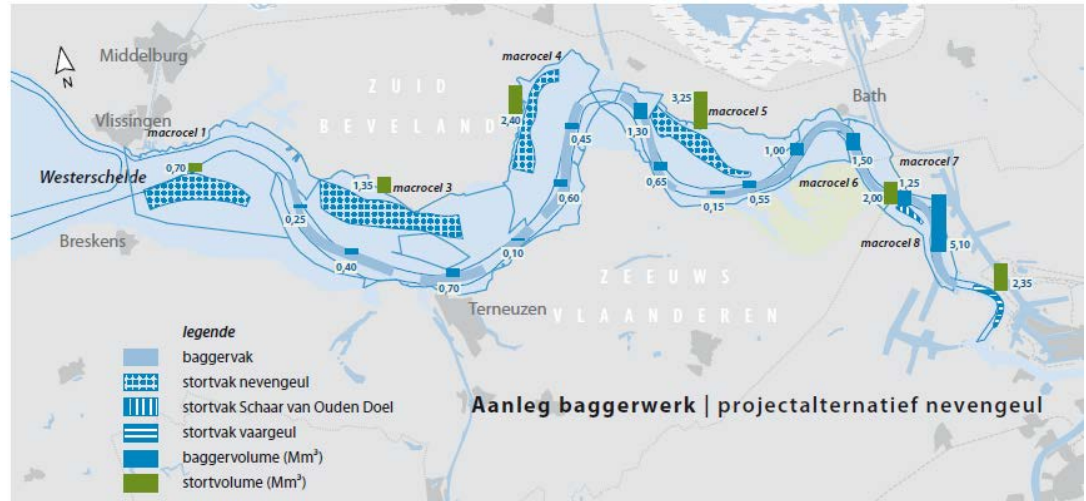


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Environmental assessment

EIA: 2 project alternatives

- Project alternative side channel



- Project alternative sandbar



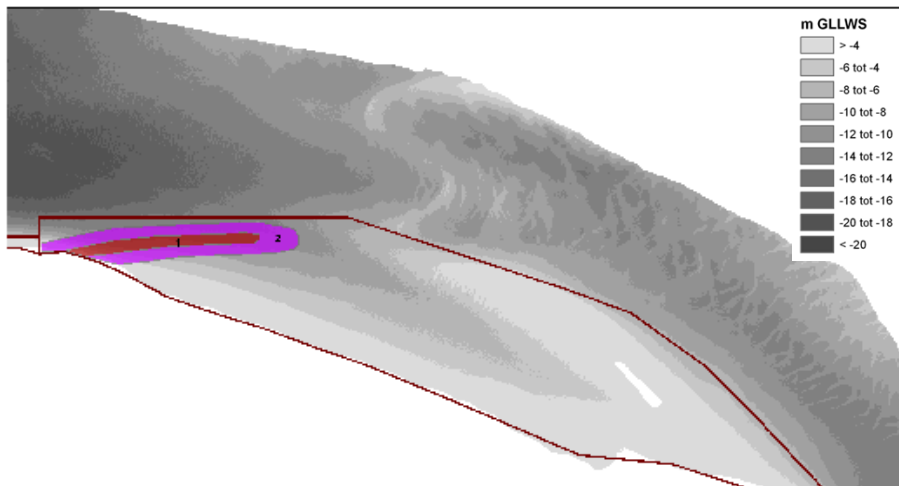
Assessment of 2 project alternatives

- Assessment of different disciplines in EIA
- No significant effect for all disciplines except “diversity species”
- Discipline “diversity species”
 - ✓ Project alternative side channel: -
 - ✓ Project alternative sandbar: +

Onderzoekdiscipline	Westerschelde	
	Projectalternatief Nevengeul	Projectalternatief Plastrand
Bodem / morfologie		
Stabiliteit meergeulensysteem	0	0
Overschrijding stortcriterium	0	0
Zandhuishouding	0	0
Water		
Waterstanden	0	0
Stabiliteit hoogwaterkering	0	0
Zoutdynamiek	0	0
Slibdynamiek	0	0
Tijdelijke effecten baggerwerken	0	0
Natuur		
Diversiteit habitats	0	0
Diversiteit soorten	-	+
Ecologisch functioneren	0	0
Ruimtegebruik en mobiliteit		
Bodem- en ruimtegebruik	0	0
Recreatieve attractiviteit	0	0
Visserijsector	0	0
Infrastructuur en mobiliteit op de vaarweg	0	0
Lucht		
Concentraties fijn stof (PM ₁₀)	0	0
Concentraties verzurende polluenten (NO _x / SO ₂)	0	0
Concentraties overige stoffen	0	0
Geluid en trillingen		
Geluidshinder	0	0
Trillingshinder	0	0
Landschap		
Geomorfologie	0	0
Archeologie	0	0
Cultuurhistorie	0	0
Visuele impact	0	0
Externe en nautische veiligheid		
Externe veiligheid	0	0
Nautische veiligheid	0	0
Mens - gezondheid		
Gezondheidsrisico	0	0
Hinder / beleving	0	0
Risicoperceptie	0	0

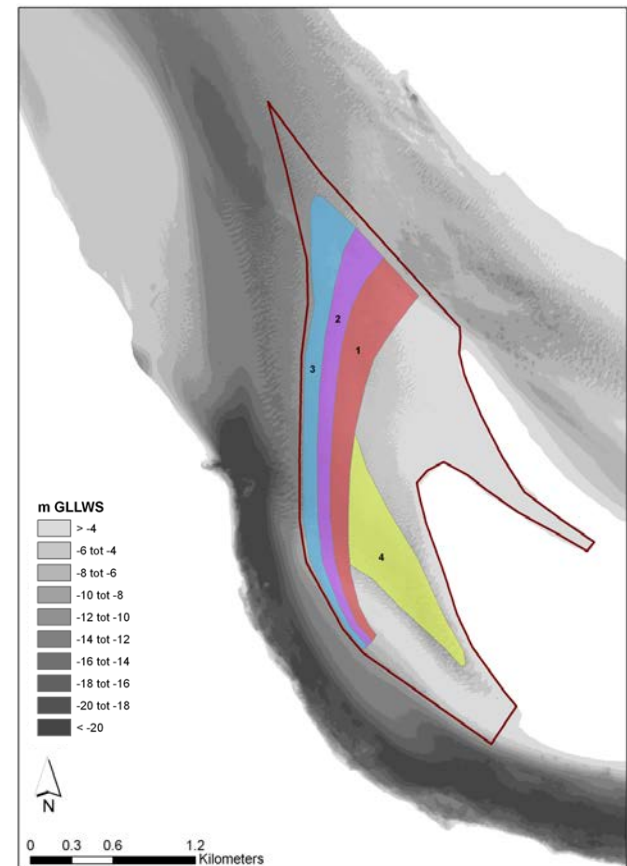
The concept of project alternative sandbar

Strategy “sand spit”

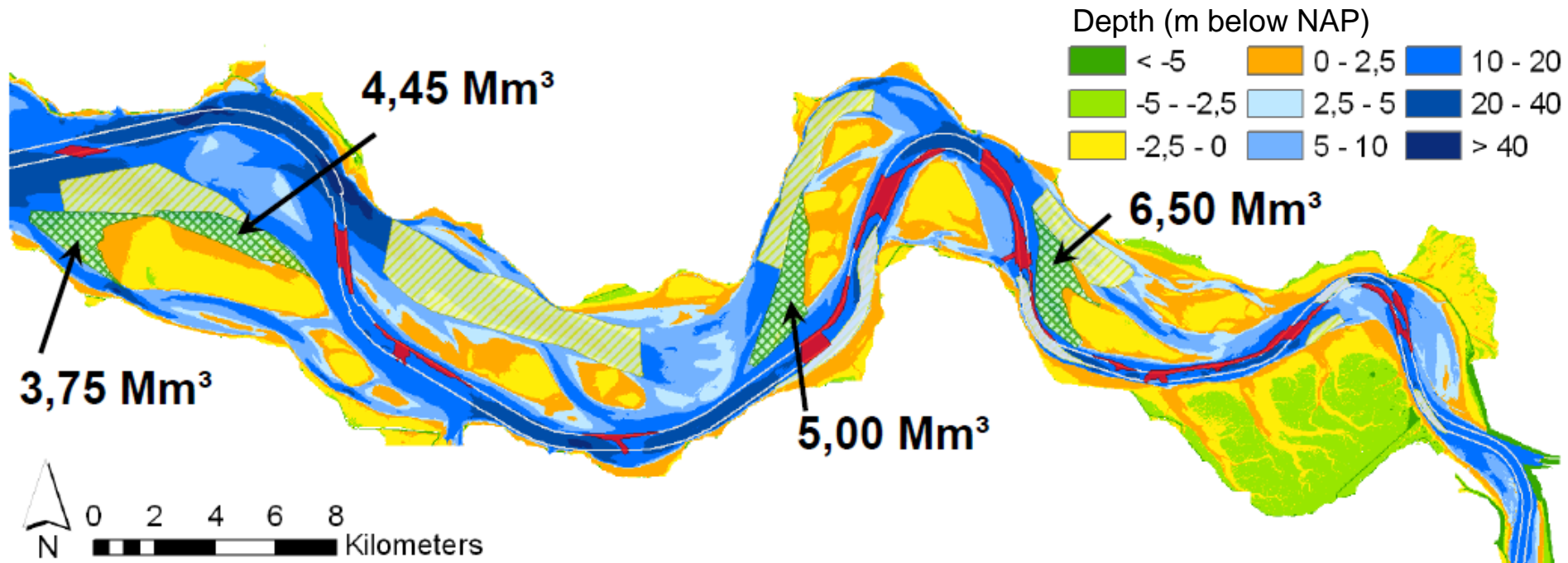


Disposal strategy as mitigating measure!

Strategy “megadune”



Most environmental friendly alternative



- Project alternative sandbar is most environmental friendly alternative
- Little significant effects of the project
 - ✓ Dutch territory:
 - no significant negative effects
 - significant positive effect on ecology (biodiversity)
 - less maintenance dredging works on sills
 - ✓ Flemish territory:
 - significant negative effect diversity of species & ecological functioning
 - loss of 4ha mudflat and tidal marsh area (Natura 2000)
 - no viable alternatives + project being of imperative reasons of overriding public interest (recognized by Flemish government)
 - permission if compensation
- Due to unfavourable conservation status of Scheldt estuary, every negative effect is considered as being significant negative
 - importance of a favourable conservation status, i.e. robust nature

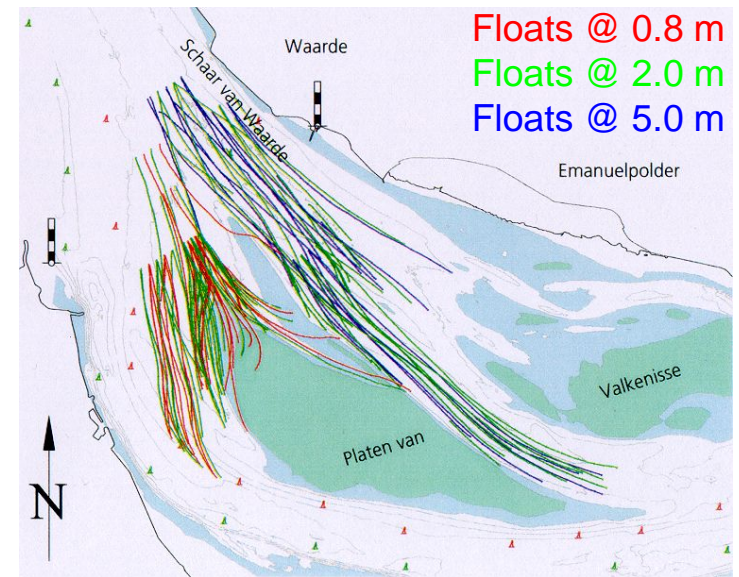
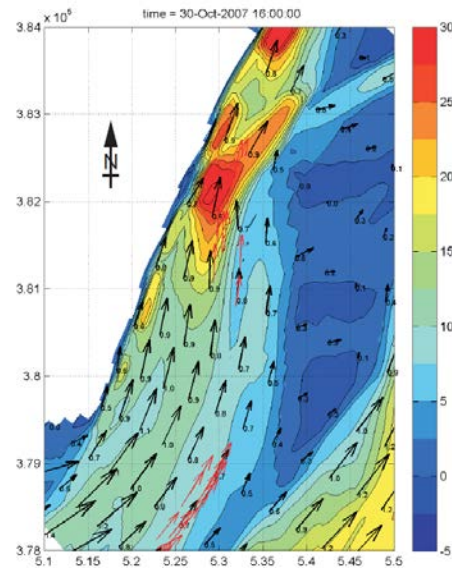
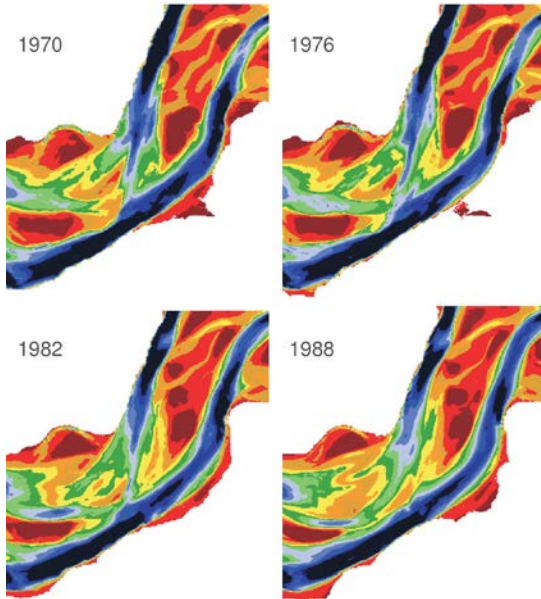
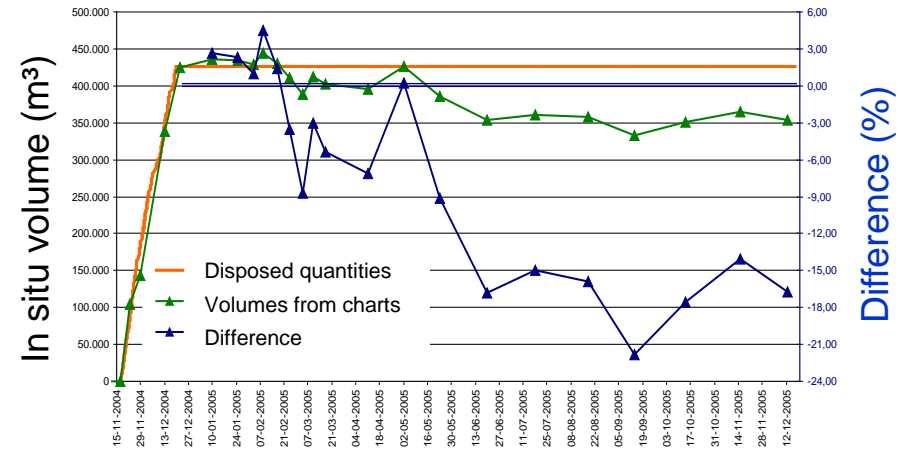
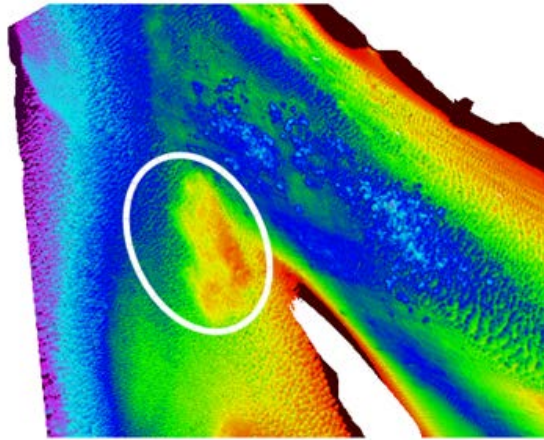
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Uncertainties

How uncertainties were minimized

- Use of state-of-the-art numerical models to make morphological predictions
 - ✓ Process-based model for medium term (Delft3D)
 - ✓ Empirical model for long term (Estmorf)
- Maximal use of expert judgement (accredited experts) to interpret results of models
- Maximal use of experience from the past
 - ✓ Intensive measurements following previous deepening campaign
- Worst case judgement of effects on nature values
- Additional research work on disposal strategy maximizing ecological potential
 - ✓ State of the art numerical models
 - ✓ Intensive field measurement campaigns to get insight in local processes
 - ✓ In situ tests to study the effect of disposal along sandbars

Maximizing the ecological potential



Despite:

- state-of-the-art models
- maximal use of expert judgement
- maximal use of experience from the past
- Intensive field measurement campaigns
- 2 in situ disposal tests

uncertainties on eco-morphological predictions in a complex estuarine environment such as the Scheldt estuary can not be avoided!

→ How to cope with this?

The 3-stage rocket approach

- Stage 1: use of most environmental friendly alternative as determined in EIA + additional mitigation measures
 - ✓ Respect distance of at least 600m to foraging areas of birds
 - ✓ Adapt disposal areas in order not to disturb haul-out sites of seals
 - ✓ Avoid disposal with sailing TSHD to minimize area subjected to burial of benthos
 - ✓ ...
- Stage 2: use of flexible disposal strategy
 - ✓ Within the permit a flexibility for the disposal strategy is foreseen
 - ✓ Based on continuous monitoring of the effects of the project, as decided by the “Flexibel disposal project group” based on **predefined thresholds**
 - ✓ Every 2 year, a **report** on the monitoring results is made. A team of cross-border experts (the so-called Western Scheldt monitoring Commission) will review this report and give recommendations to responsible government on
 - Change of disposal strategy
 - Change of monitoring programme
 - Additional research
- Stage 3: possibility to stop the project if negative effects would occur
 - ✓ (temporarily) stop of disposal activities
 - ✓ remove disposed material

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TIDE project

- Project within the Interreg IVB North Sea Region Programme
- Study on how is coped with uncertainties in recent case studies in estuaries
 - ✓ Eems: enlargement of navigation channel
 - ✓ Humber: Immingham Oil Terminal Approach channel dredging
 - ✓ Scheldt: enlargement of navigation channel
 - ✓ Stour & Orwell: Harwich Harbour Approach channel deepening, Trinity III Terminal Extension, Barths Bay Container Terminal, Felixstow South Reconfiguration
 - ✓ Weser: construction container terminal 4
- Strategy
 - ✓ Literature review
 - ✓ Interviews with different stakeholders involved in the project



Origin of uncertainties



- No universally accepted limits exist on significance of an effect
- The predictions made through modeling are often subject to significant uncertainty. Interpretation of results by experts is necessary.
- Past experience is often crucial in gaining acceptance to a project
- Mechanisms to deal with uncertainties in EIA/SEA and AA have been developed:
 - ✓ Implementation of **precautionary compensation** to account for potential failure (e.g. new mitigation technique)
 - ✓ A **legal agreement** that commits applicant to take corrective measures in case mitigation and/or compensation don't meet objectives
 - ✓ Establishing a forum for reporting results of monitoring programmes which can allow changes to be made to a programme of mitigation or compensation (**flexible approach**)

- In case of any remaining scientific uncertainty with regard to the effects of a project, the consenting authority could grant its consent under **special conditions** (e.g. adaptive strategy)
- Such special conditions should include a **pre-defined and validated scheme to monitor** the actual impacts as well as a **framework to adapt the mitigation/compensation measures** regarding the actual impact
- Such special conditions could be accompanied by a separate **legal agreement** committing an applicant to take corrective measures or eventually stop the project
- A long-term **forum with stakeholders for reporting** the results or any other vigorous follow-up mechanism is required
- **Financial warranties** should be put in place that can guarantee long-term implementation and protection

Questions?



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