Tidal River Development

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The Interreg IVB North Sea Region Programme

Tide from the viewpoint of ports

Expectations and opportunities

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Estuaries and ports in conflict?

- Goods transport deep into the hinterland by using estuaries as fairways for seagoing vessels is both the most economic and *(is potentially)* the most ecological way of transport
- The economic welfare of big parts of Northern Europe will depend on accessibility of its ports
- A major concern of the inland seaports is to maintain commercially viable water depths of the estuary navigation channel

→ need for dredging in estuaries

Estuaries and ports in conflict?

- However, dredging and disposal can affect the hydrodynamic regime and morphology of an estuary

>< Disturbing Estuarine natural balance

>< Increased flood unsafety (penetration of the tide)

>< Destruction of Habitats, disturbing Wildlife

- Ports receive most (if not all) of the blame

Nature Untouched = Nature Best?

Heath land

North-American Prairies

Habitat quality sustained because of purposeful management

“Working with nature”= Nature conservation

NEW! DELTA 2007, Issues and SystemUnderstanding

Review of existing practices in dredging management of partner countries. Report 6.1

With regard to the environmental groups, the report tries to overcome the "rejection reflex" in the debate about the impact of the proposed activities. It shows, on the basis of concrete examples, that dredging work and disposal of dredged material aimed at improving shipping access do not necessarily have a negative impact on natural habitats or on the normal morphological dynamics of the river. The perception in ecological circles is that the best way to conserve nature is for human intervention in the estuary to be kept to a minimum. Since every intervention is normally viewed as one too many – especially if it is carried out with an economic objective – the debate concerning the relationship with the Birds and Habitats Directive is currently limited to the question of how 'significant' the negative impact on the estuary will be, in comparison with other developments. By contrast, this theme aims to go further, showing how a carefully designed dredging and disposal/use strategy that forms part of an holistic approach can, in appropriate situations, actually make a positive contribution towards reducing undesirable effects on the natural system.

Estuaries of today: need for management

- Estuaries of today: management is essential to secure its different main functions
  - Ecology
  - Safety against flooding
  - Accessibility of the ports
- What is the best management strategy to reach sustainable estuaries?

Can we develop a management strategy that is beneficial for the different main functions of an estuary?

Ports believe that Tide will add to the answer:

- By integration of knowledge
- By gathering new information
- By interestuarine comparison
- By performing specific pilot measures
- By enhancing ongoing sustainable plans
- By dialogue across borders and perspectives

Morphological management strategy Keys to win-win solutions

- Not only taking into account the short term societal benefits and costs of the moment
- Goal is to generate a flexible geometry conserving morphological diversity, complexity and mobility of a multiple channel system
- Strategy should aim at the following operational targets:
  - Controlling the propagation of the tidal wave
  - Increasing self-erosive action of the currents at sills
  - Maintaining (or possibly improving) the diversity of biotopes

Morphological management strategy
Keys to win-win solutions

- Measures for morphological management
  - i. Morphological dredging
  - ii. Morphological disposal
  - iii. Modification of hard bordering that obstruct natural river flow
  - iv. Construction of new “soft” measures that could be adapted easily if needed (dynamics of the system)
- Working with nature, not against

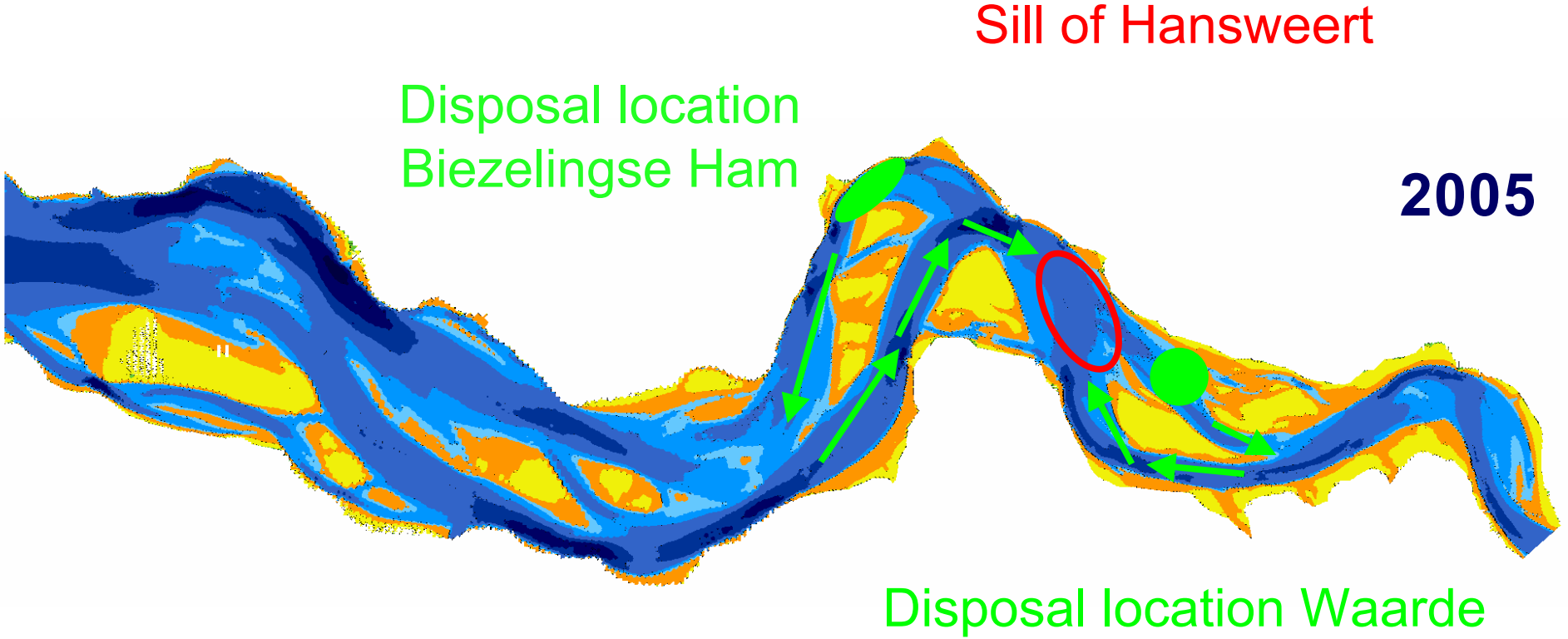
Example: counterposing disposal strategies

- Traditional disposal strategy
  - Disposed sediments will be transported to the sills anyway
  - Efficient disposal: time between disposal and “re-dredging” need to be as large as possible
- Morphological disposal strategy
  - Morphological evolutions of the estuary are observed
  - Disposed sediments are used to initiate (local) morphological evolutions of the estuary trying to improve the overall morphology (ecology, safety, accessibility)

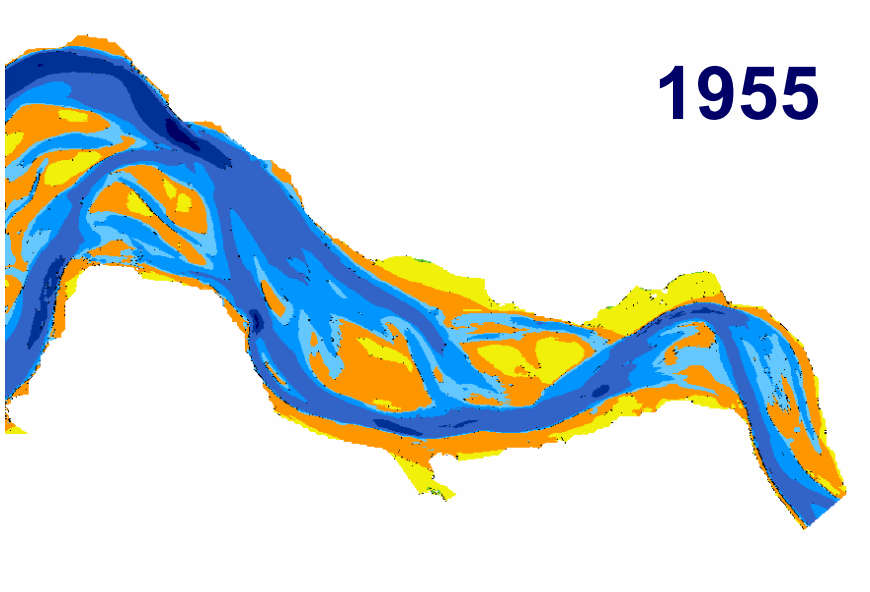
Developing a Morphological disposal strategy in the Western Scheldt.

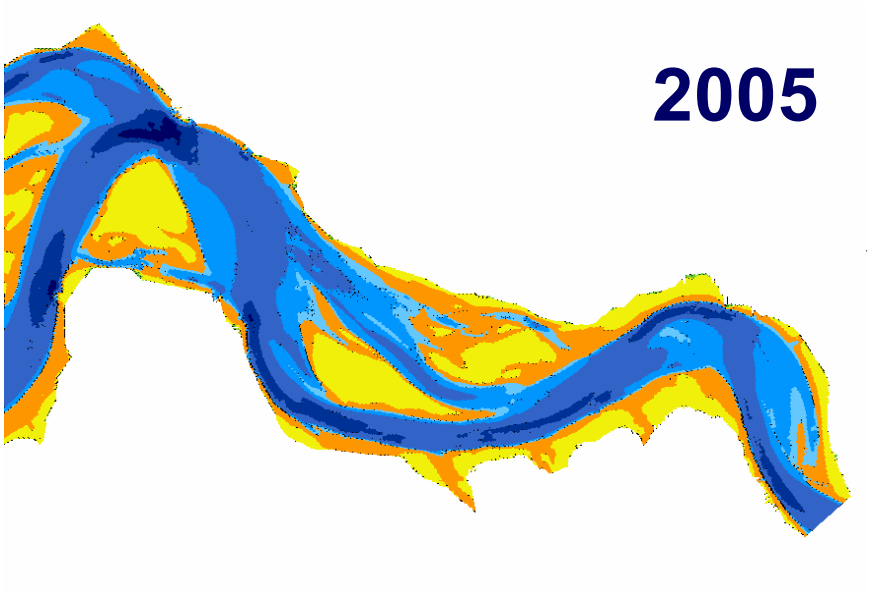
A pilot project on the shoal of Walsoorden

Shoal of Walsoorden: introduction

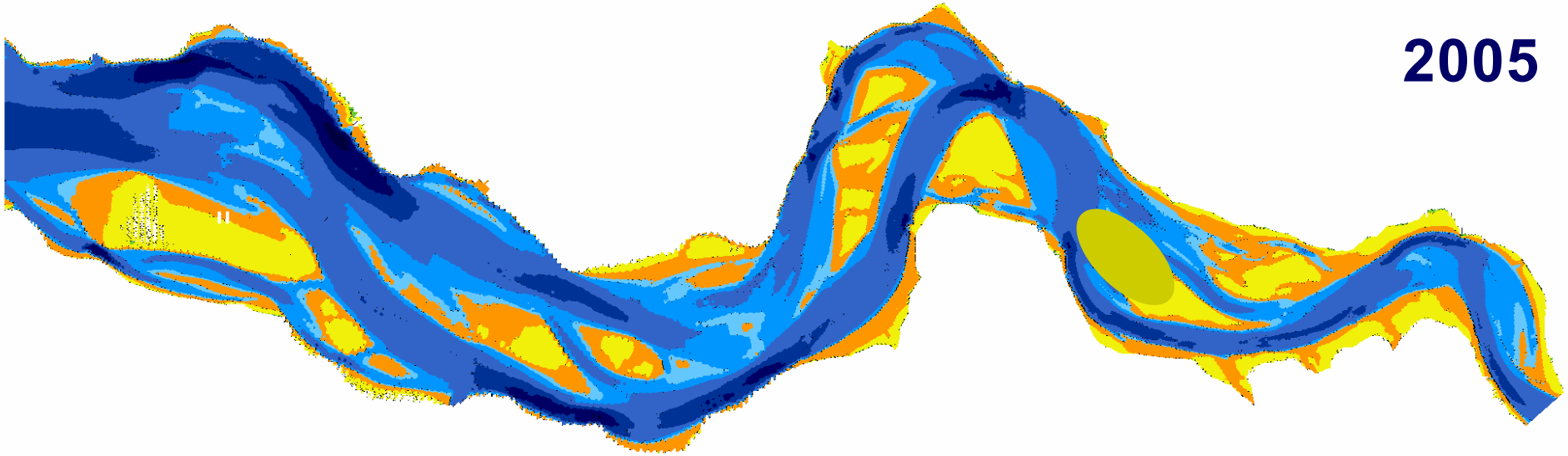


Shoal of Walsoorden: history





Shoal of Walsoorden: proposal



- Distribution of flood current (multiple channel system)
- Increasing self-eroding capacity of flow on sill
- Reduction flow velocities on shoal

Morphological disposal strategy in the Western Scheldt
Pilot project Walsoorden

- Feasibility study (2002-2003)
- 2 in situ disposal tests (2004 & 2006)
- Extensive monitoring programme (2004-2009)

=> Conclusion: the morphological disposal strategy at the shoal of Walsoorden is feasible

Morphological management strategy

The cause of erosion of the shoal tip in the past needs to be taken care off as well!

↓

Morphological disposal strategy is only part of morphological management strategy of the Scheldt estuary

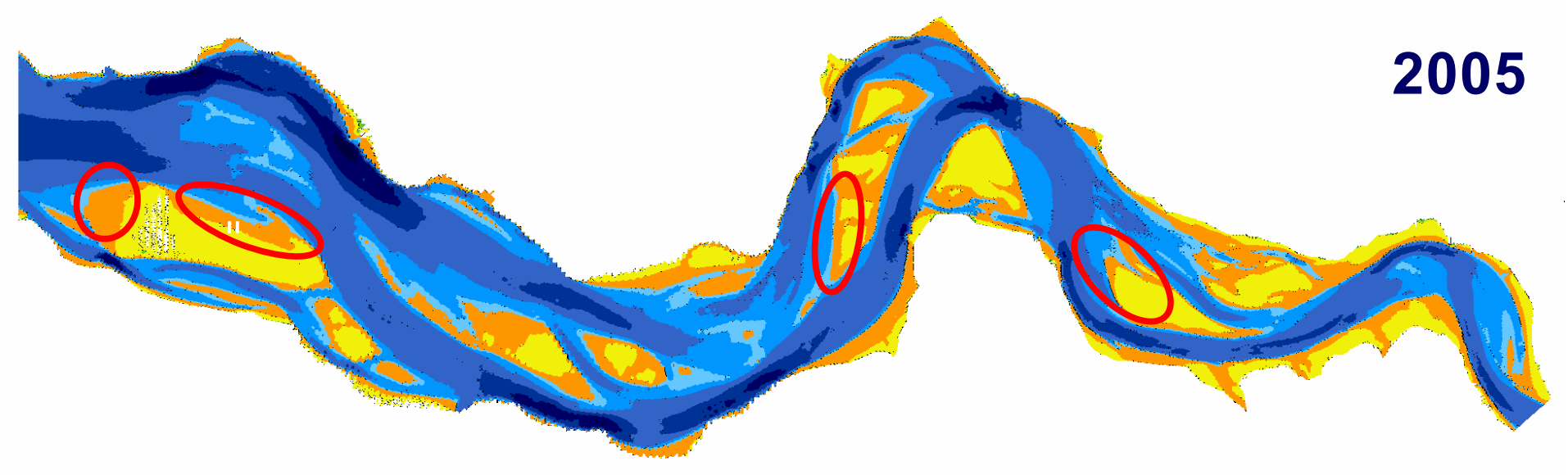
Enlargement of the navigation channel in the Western Scheldt

Elements of a morphological disposal strategy

Enlargement of navigation channel

- Tide independent accessibility to port of Antwerp for ships with draught up to 131 dm
- Capital dredging works: 7,7 Mm³ in Western Scheldt
- Environmental impact assessment: creation of ecologically valuable ecotopes through morphological disposal on the edges of sandbars

Morphological disposal locations



Conclusions

- Tide offers a good opportunity to enhance the sustainable development of estuaries
- One specific point of interest is learning from each other with regard to sustainable morphological strategies
- Win-win solutions should prevail: morphological management should be economically viable, decrease flooding risks and promote nature conservation simultaneously

Conclusions

- A paradigm shift can support these solutions: careful, purposeful management, based on excellent know-how as a means to reach a better estuarine nature than leaving it as it is
- Ultimately morphological management strategies, including maintenance dredging and disposal, could be accepted as instruments to preserve valuable estuarine ecology, and no longer as a threat

Questions?