Hydromorphological challenges for sediments

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Hydromorphology?

- Definition:

  “The knowledge of the shapes in the landscape as created under the influence of water.”

News: hydromorphology and sediments

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International

Belgium demands resumption of Dutch dredging

Schips on the Westerschelde going to and from Antwerp. *Photo Rob Huibers*

Flooding Dutch polder is best way to restore nature

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Dutch prime minister admits that dredging of river Scheldt will not take place this year

The Dutch prime minister Jan-Peter Balkenende admitted that there would be no dredging of the Westerschelde before January. After meeting with his cabinet he stated that all options were considered to ensure the dredging of the Westerschelde and prevent the removal of polders, but immediately added that it was up to the Council of State to rule on the matter and that his government was not authorised to interfere with the jurisdiction. Following the promises made by Balkenende

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Sediments and hydromorphology; a true challenge!

1. WFD and hydromorphology
2. Sediments and ecology
3. Examples
4. Challenges

Water Framework Directive

- European legislation
- Improving water quality & ecology
- Monitoring:
  - Chemical-physical
  - Biological
  - => Hydromorphological

WFD in NL

- Water types
  - R-type, rivers, creeks and tidal rivers
  - M- type, lakes, ditches and canals
  - K&O-types, coastal waters
- Monitoring
  - Handbook Hydromorphology
  - Fact sheets per parameter
- Sediments?

Hydromorphology in Hamburg?

- Soil type
- Bank protection
- Natural flow

Sediments and ecology

- Base for plant rooting
- Home for macro fauna
- Structure differentiation
- Hunting and foraging




Sediment related parameters coast

Quality element	Parameter
Morphology	Water depth distribution
	Soil type (natural, artificial)
	Substrate composition
	Tidal zone: a. Type of inter tidal area b. Dry period duration

Example: coastal sedimentation

- Water region: Dutch coast
- Project: the Sand Engine
  - Problem:
    Disappearing Dutch coasts
  - Solution:
    10-year cycle sand suppletion
  - Problem:
    Extinction marine beach life

Example: coastal sedimentation

- Solution – Building with nature:
  - Reconstruction large sediment island
  - Natural gradual sediment distribution

Artists Impression

Sediment related parameters rivers

Quality element	Parameter
Continuity	Possibility to pass barriers for sediment
Morphology	Drainage pattern
	Cross section and extent of naturalness
	Substrate constitution bed
	Erosion / sedimentation structures

Example: reconstructing river bed

- Water region ‘Velt en Vecht’
- Project: Mariënberg
  - Enlarging winter bed 70 ha
  - Digging new side gully

Example: reconstructing river bed

- Ecological goals
  - New riparian forest
  - New habitats for macro fauna and fish
- Hydromorphological improvements
  - More natural river flow (meandering)
  - More natural sediment distribution

WFD sediment related measures

- Examples 2010 – 2015
- State water board (paus-table)
  - Lowering flood bed - 1544 ha - M€ 2,4
  - Water soil improvement - 12.448 ha - M€ 176,0
  - New side gullies - 78 km - M€ 34,3
  - Fish passages - 218 sites - M€ 23,9

Challenges!

- Scientists:
  - Monitor hydromorphological impact?
  - Hydromorphological risk assessment?
  - Effects WFD measures?

Challenges!

- Policy makers:
  - Decide on which measures
  - Allocate money for:
    - Measures
    - Monitoring
    - Maintenance
  - Inform the public!

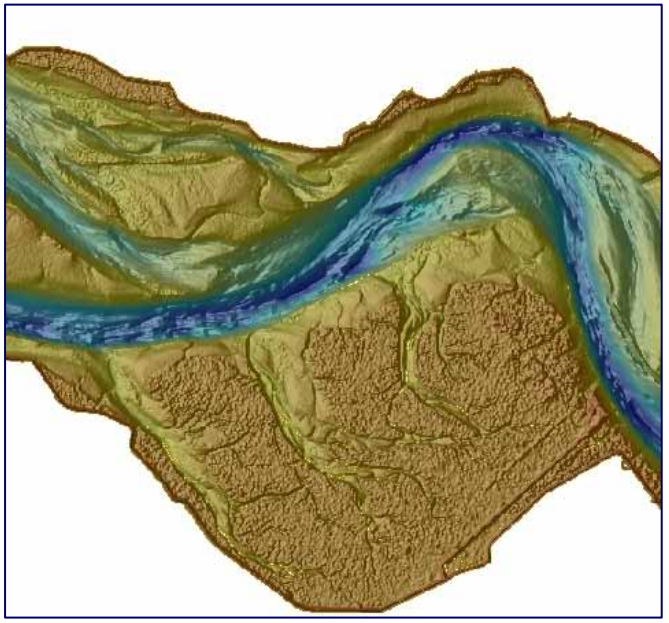
Challenges!

- Dredgers and contractors
  - Innovative solutions
  - Sediment types
  - Integrated maintenance contract
  - Monitoring methodologies and techniques

Where do sediments fit in?

- Catchment management plans?
- Sediment frame work?
- Marine Strategy Framework?

- Hydromorphology!



Example dry fall period West Scheldt

Discussion!?

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