



Building with Nature



EcoShape

Ecological Landscaping of Extraction Sites: *Opportunities for a Second Life*

SedNet, Venice, 8 April 2011



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Presentation

- Situation (motivation)
- Building with Nature programme
- Pilot project Ecological Landscaping
 - Basis
 - Creation pilot sites
 - Results and lessons learned



Situation and trends: motivation for a BwN approach

- “Busy” coastal zones = increasingly complex projects
- Development of large-scale projects characterized by uncertainties and delays
- Focus on threats and risks instead of opportunities leads to restrictive requirements (interpretations)
- Extensive environmental management plans and monitoring requirements

***Overall acknowledgement for need of
sustainable & pragmatic solutions***

How does Building with Nature fit in?

Pilot-based, pragmatic research programme, 3 pillars:

- **Dynamics of natural system** as starting point for design and realisation of maritime infrastructure
 - Design fits with natural (eco-)system dynamics
 - Make optimal use of natural processes
 - Explore opportunities to promote nature development
- Mind-shift from defensive (minimize environmental impacts) to **offensive approach** (optimize full economic and environmental potential)
- **Integration** of disciplines: engineering & construction, ecology & environment and governance

Building with Nature Organisation

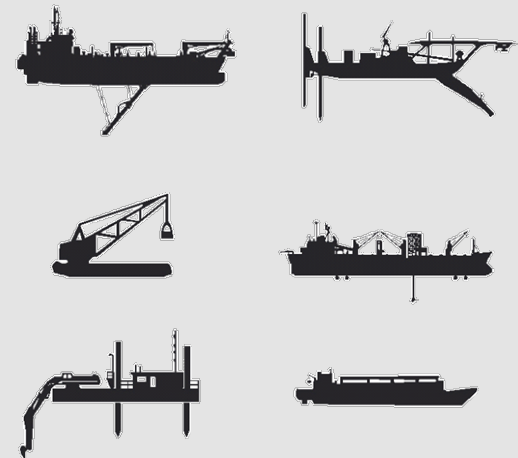
- Program duration **2008-2012**
- Budget ca 30 mln euro (approx 40 mln \$)
- Main outcome: **Guideline** & Tools for **Ecodynamic Development & Design** based on pilots and monitoring
- All key stakeholders involved!
 - Contractors (initiators): Boskalis, VanOord
 - Industry: IHC Holland, Vereniging van Waterbouwers
 - Consultants: Witteveen + Bos, DHV, Haskoning, Arcadis
 - Scientific Institutes: Deltares, Imares, NIOZ
 - Universities: Delft, Wageningen, Twente
 - Port authority: Port of Rotterdam
 - Government: RWS-DI, City of Dordrecht



Co-Initiator: *Royal Boskalis Westminster*



- Dredging and marine infrastructure contractor
 - construction & maintenance of ports and waterways
 - reclamation of land
 - protection of coastlines & riverbanks
- New contracts:
 - D&C
 - Early Contractor Involvement
- Investor in Building with Nature programme



Why start with Ecological Landscaping?

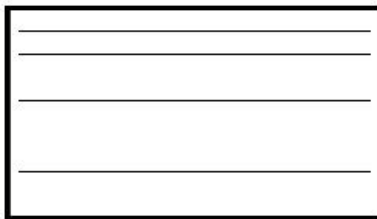
- **SITUATION:** No clear guidelines on ecology and sand extraction sites
- **RISK:** Conservative approach can lead to improbable prediction of effects and related mitigation measures
- **BENEFITS of BwN approach:** Large potential for ecological development and mutual benefits for stakeholders
 - habitat diversity (benthos)
 - Positive effect on populations of fish, birds & mammals
 - increase economical value of a dredging area?

Provide answers to ongoing discussion on re-use of dredging sites through innovation and factual research

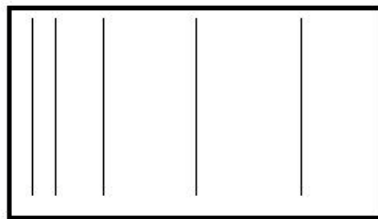
Design options

Search for operational, ecological, hydraulic/morphological parameters

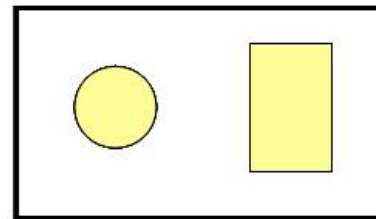
Landscaping patterns:



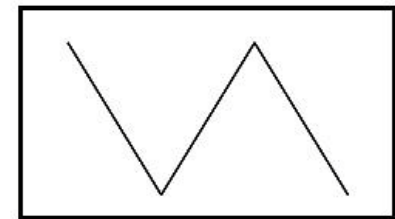
**Sand waves
in line with
main currents**



**Sand waves
perpendicular
to currents**

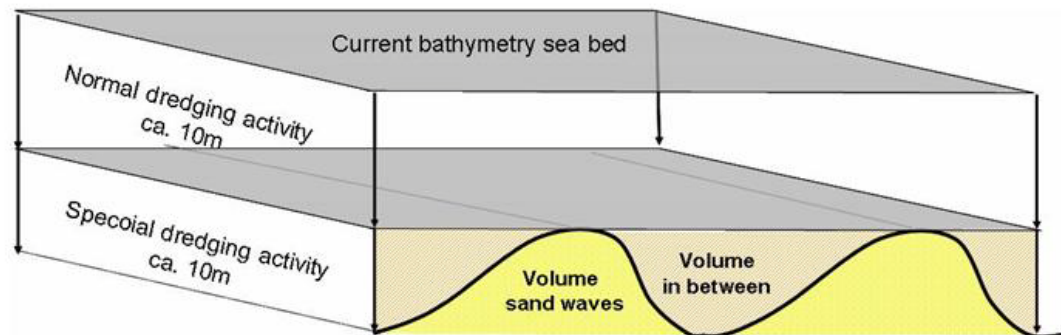
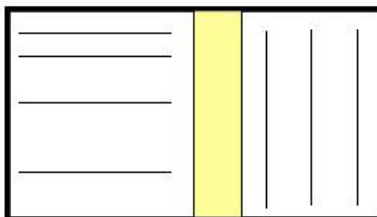


**Mounds or
plateaus**

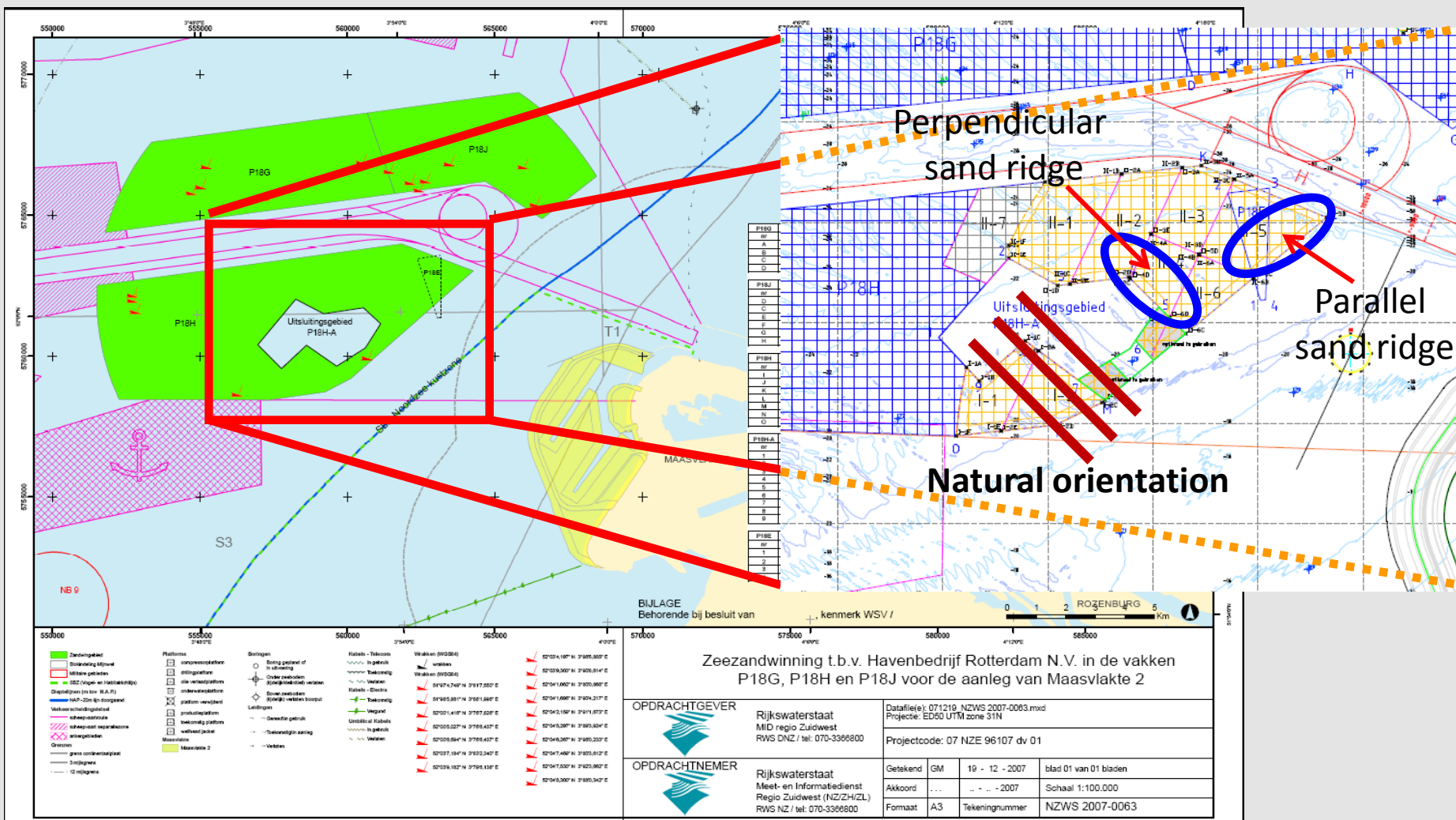


**Varying shapes
based on sand
availability**

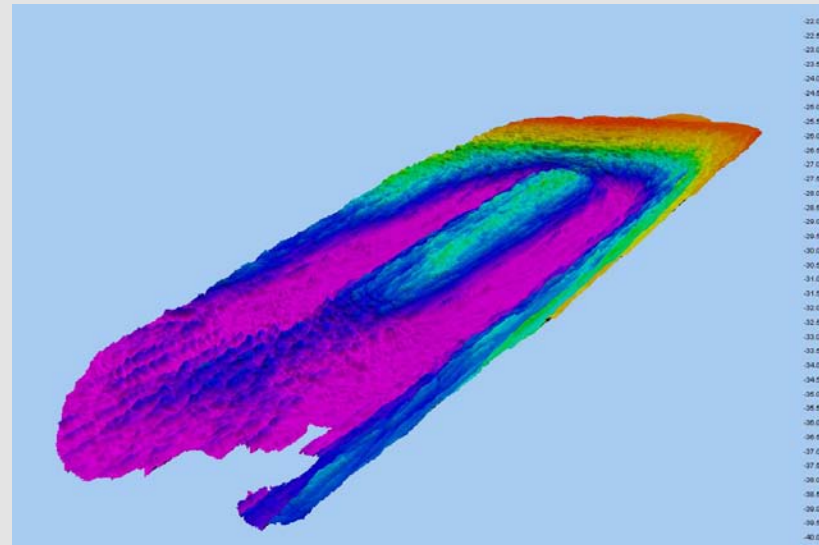
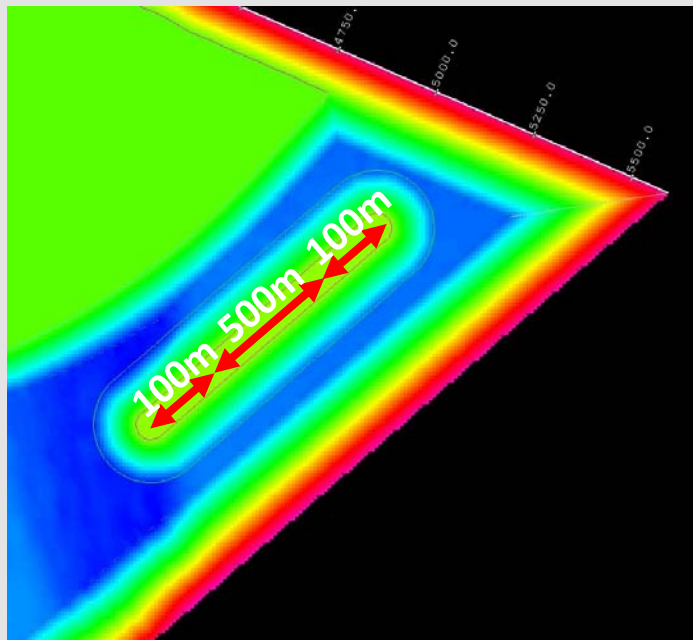
Combination:



Location of pilot site



Creation of 'parallel' Sand Ridge



North Sea
(ca. -25m)

plateau
(ca. -33m)

70-100m

Slope 1:7 - 1:10

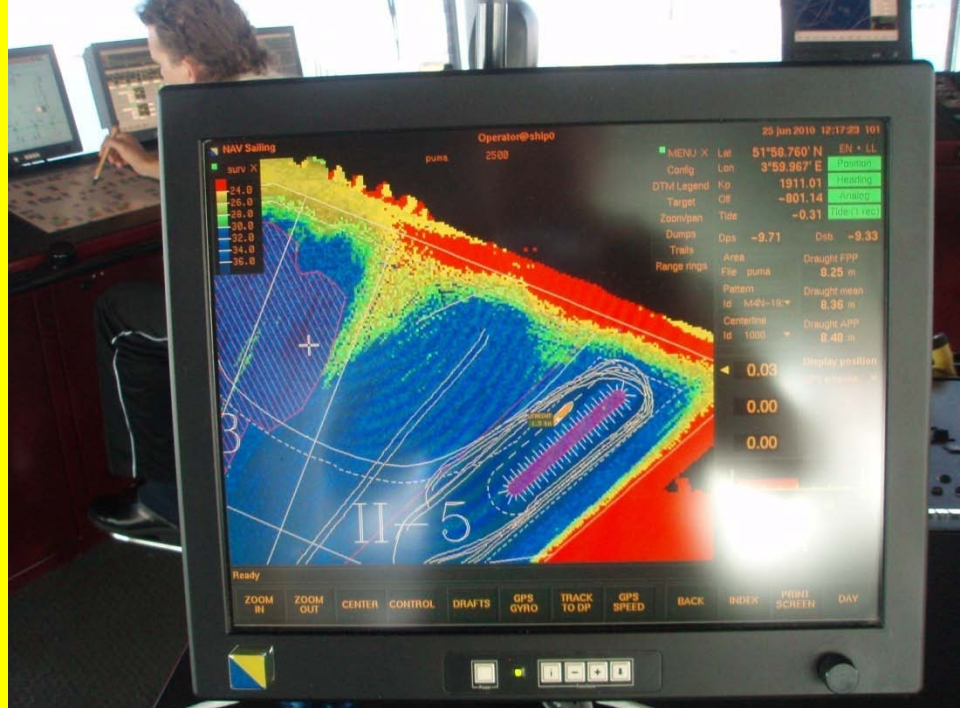
Edge of dredge area

10m

ca. -42m

Sand Ridge

>3Mm³ / week !!



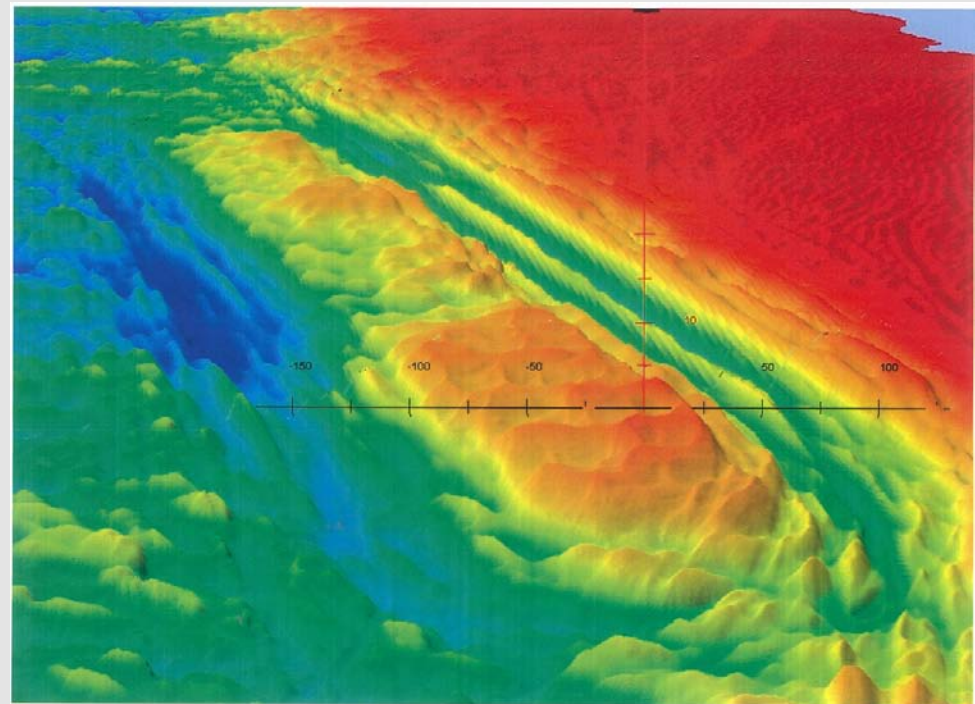
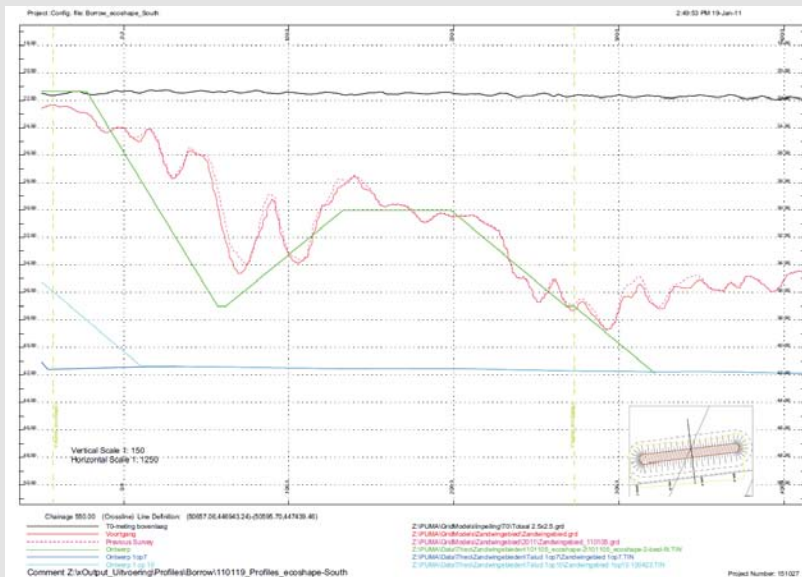
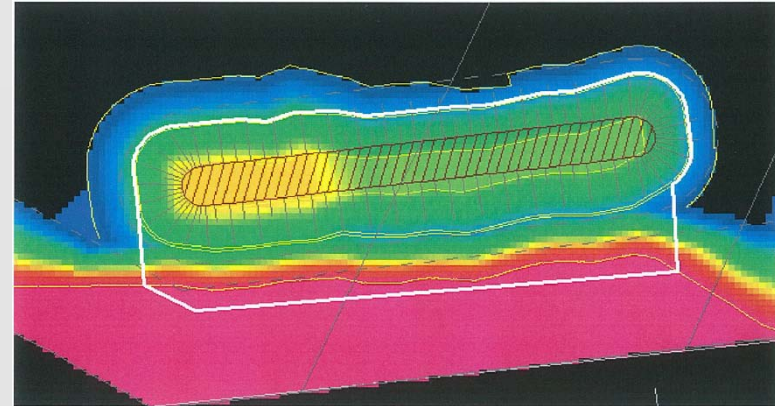
25 June 2010



Perpendicular Sand Ridge



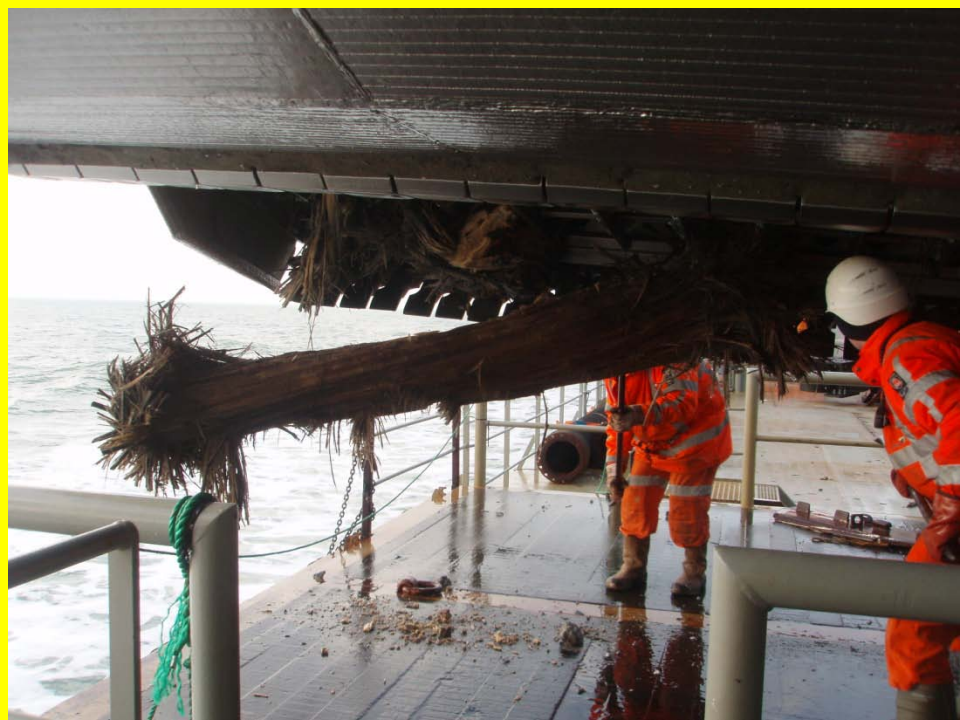
Creation of 'perpendicular' Sand Ridge



Under construction!!



22 November 2010



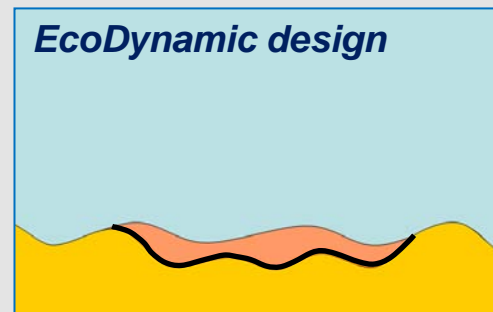


Monitoring, Monitoring, Monitoring, Monitoring, Monitoring!!



Results and lessons learned

- Gained new insights and created database (learning process)
 - Preliminary results show differences in fish population
 - New results in summer 2011
 - Yes, a second life appears to be feasible!
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1. Investigate and understand natural situation
 2. Discuss and integrate ecological design at start of project
 3. Involve all stakeholders, determine aim and expectations
 4. Involve dredgers to test design practicality
 5. Landscape during extraction process





Thanks for you attention!

More information on Building with Nature

www.ecoshape.nl

