

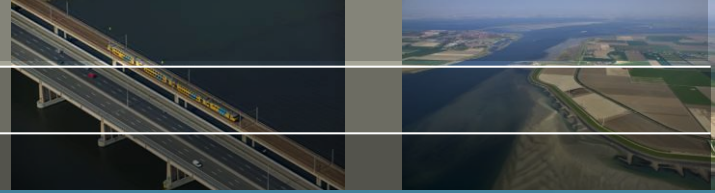


Build safety against flooding with Nature

Integrate thinking and doing into practical BwN solutions
December 2010

Mindert de Vries

Advisor eco-engineering
Lector Building with Nature Hogeschool Zeeland



**Building with Nature
challenge =**

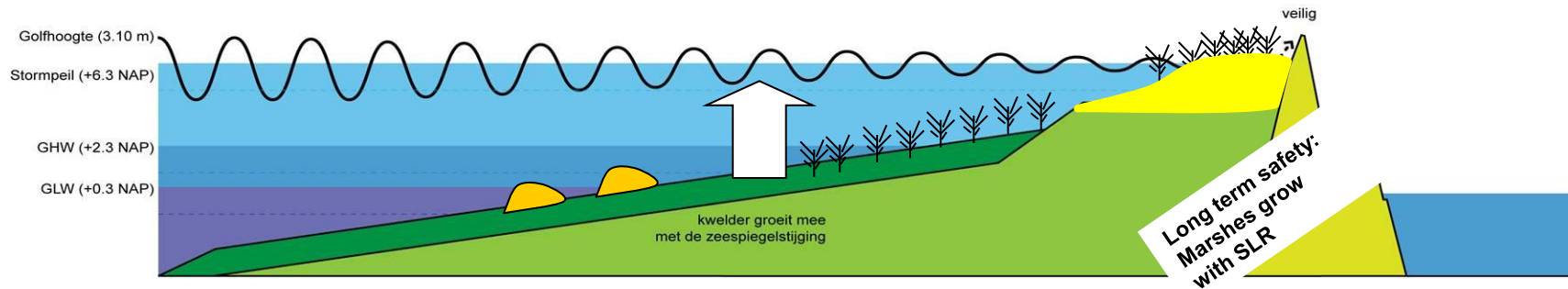
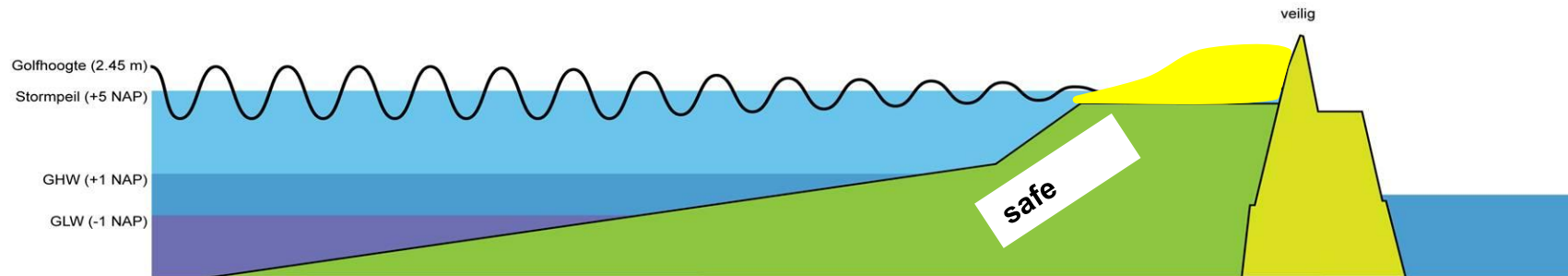
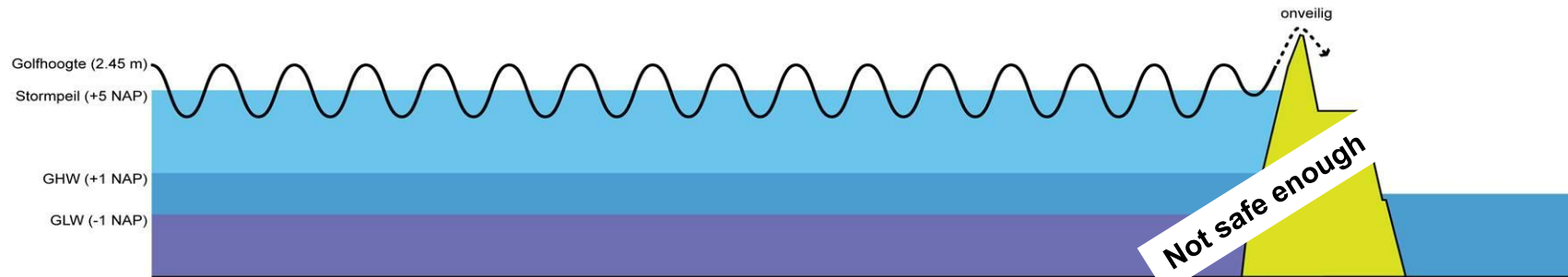
use the

dynamics and services of the ecosystem

to

**realize safety, function combinations
with economic feasibility**

Building with nature by reef, marsh, dune creation and hard structures....



Situatie bij een superstorm, 1x per 10.000 jaar

Examples of practical solutions 2009-2010



- They are practical,
- They are cost-effective,
- They fit within legal constraints.

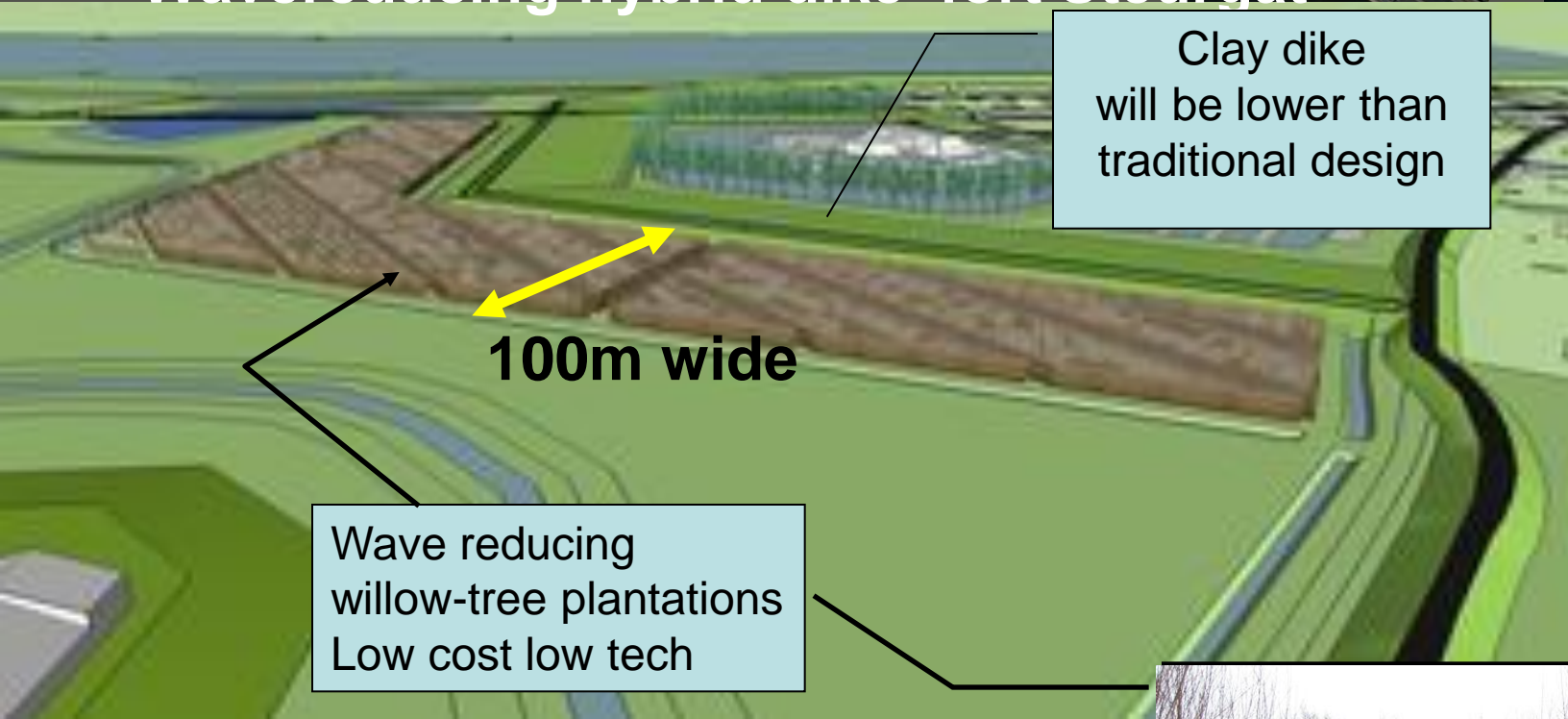
2010, Ecoshape: foreshore protection with reef large scale oyster reef experiment (2x 200m x 20m)



Reduce erosion of intertidal areas
in Eastern Scheldt



2009 RfR programme Noordwaard Wavereducing hybrid dike 'fort Steurgat'

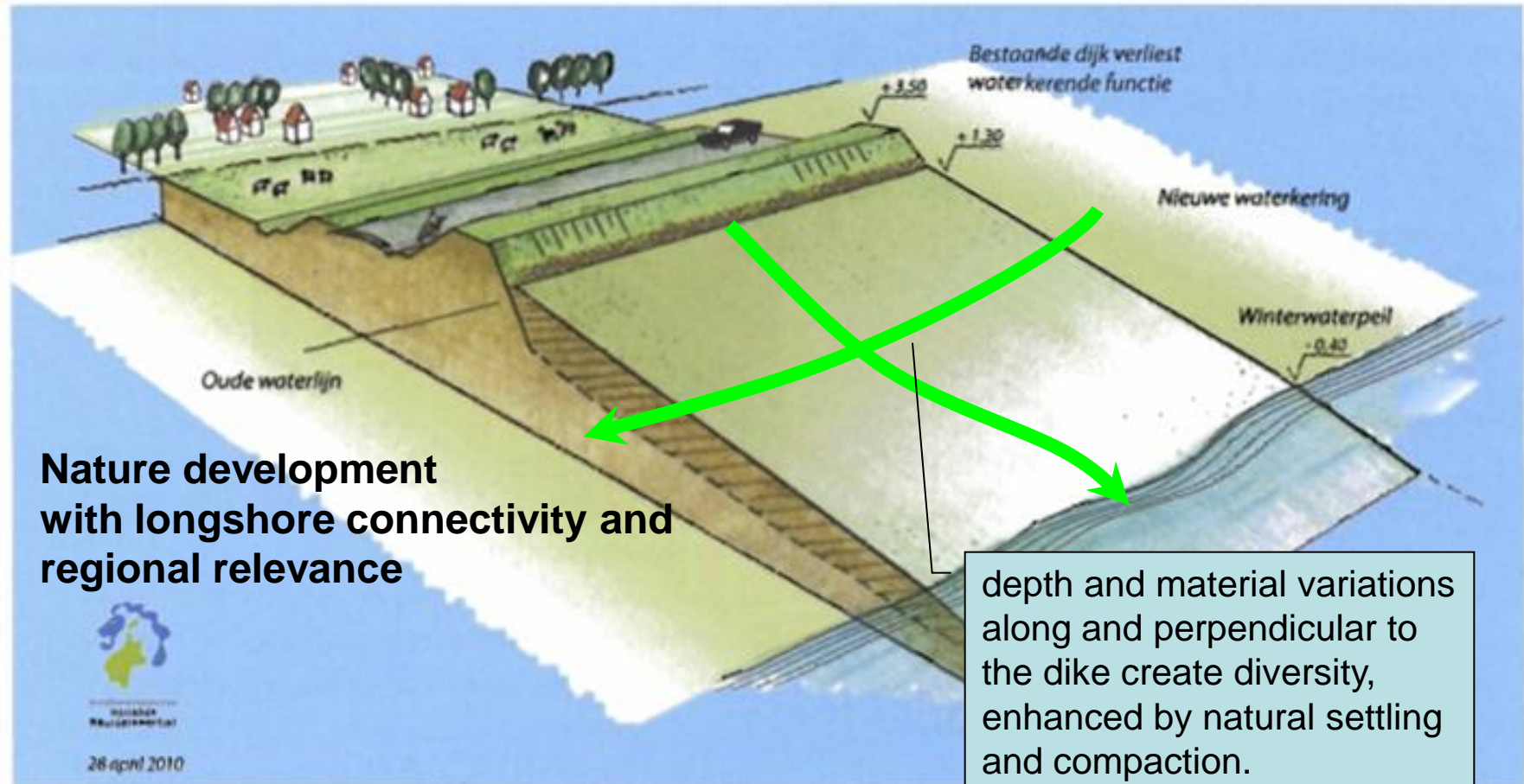


Deltares/RWS concept achieves
required 1/2000 safety standards and
will be constructed before 2015



2010, HHNK, RWS-WD, Deltares, Haskoning: 'bankdike', soft safe green flexible dike

'Principeschets' Oeverdijk (tekening: Hoogheemraadschap Hollands Noorderkwartier).

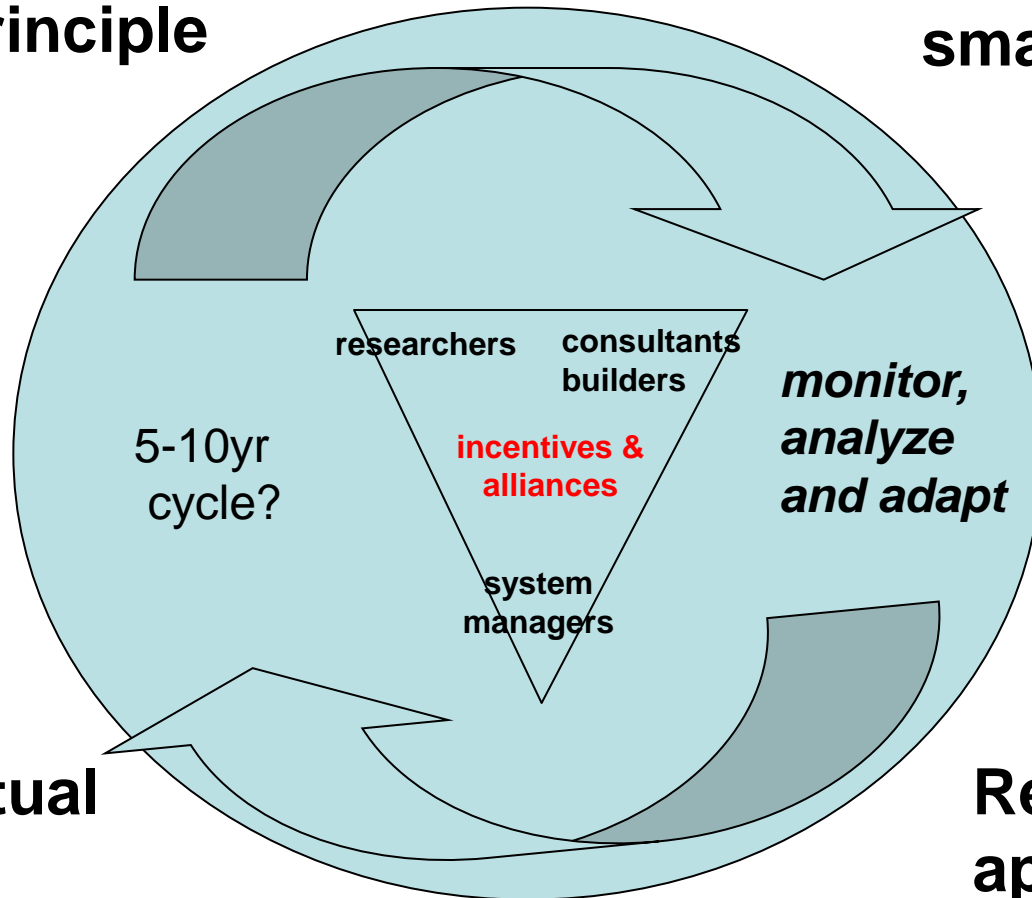


50m wide, many km, large wave reduction, high nature value, along lake shore

Cyclic approach with co-operating partners is effective, urgent need for more pilots and applications

**Test
proof principle**

**Pilot
small scale**



**Conceptual
design**

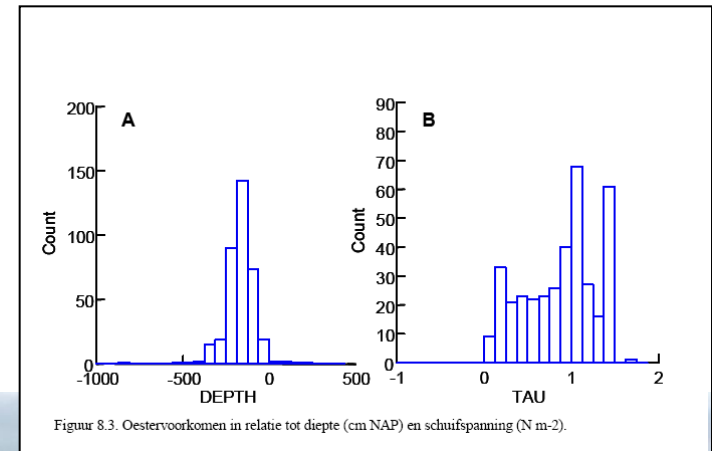
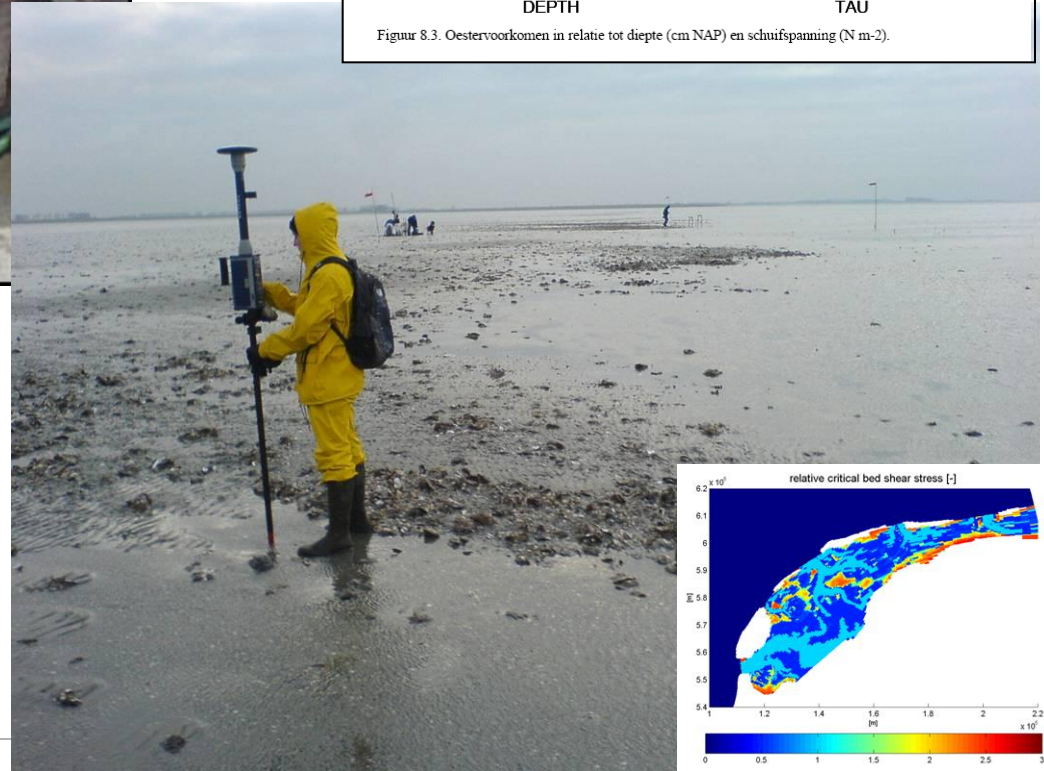
Application: Floating wavereducing marsh, Houtrib sinking marsh for Zeeburg, EVZ (NMIJ, gem Amsterdam)



We need an improved floating design!



Research must go on, we want proof of principle and predictive capability



New thinkers and do-ers: The next generation being trained at Delta Academy in Zeeland



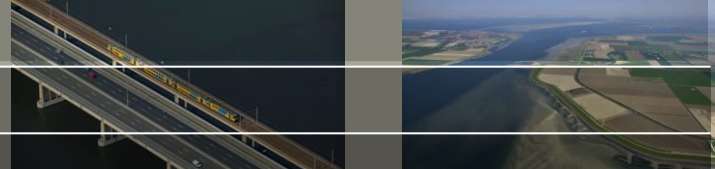
We can build cost-effective safety with nature!



Need for different thinking and different acting

- What can the project do for the ecosystem, what can the ecosystem do for the project? Think beyond compensation and mitigation;
- Allow dynamics and accept site specific nature of the BwN solutions;
- Think in cycles and allow adaptive designs and management;
- Accept and manage involvement of new parties into the development, implementation and maintenance process;
- Provide adequate training, tools, guidelines and protocols;
- SLR/Deltaprogramma/HWBP: We have time and space to work with nature and increase knowledge/experience: use it!

Thank you!



You can contact me at
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see also:

Levendewaterbouw.nl