

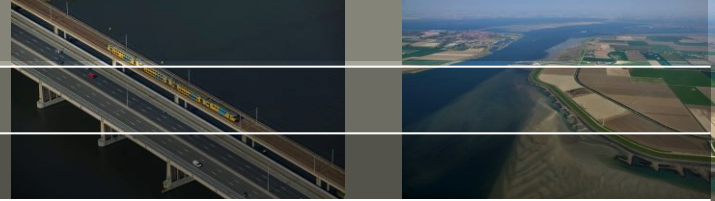


## **Nature-based engineering & Water services**

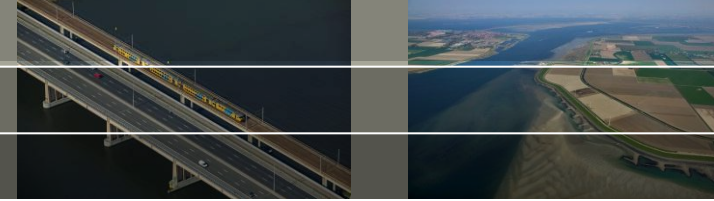
Victor Beumer, Deltares, The Netherlands

17 juni 2014

# Deltares briefly



- Over 800 employees in Delft and Utrecht, The Netherlands
- Institute for applied research in the field of water, subsurface and infrastructure
- Focus on deltas, coastal regions and river basins
- Open source works
- Hydrology, Geology, Ecology, Policy & Planning, Civil engineering, Software design.



**EU Green Infrastructure:** A strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services.

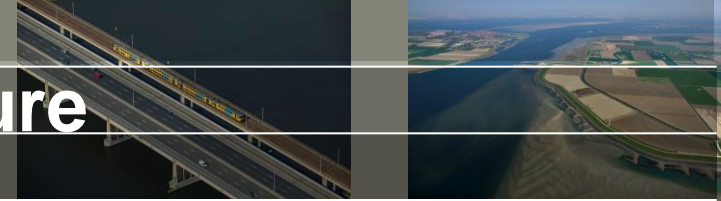
**WssTP interpretation:** Develop natural or semi-natural areas for 1. Water purification, 2. Water storage and 3. Water safety. (Nature-based engineering)

Environment Commissioner Janez Potočnik said: *"Building green infrastructure is often a good investment for nature, for the economy and for jobs. We should provide society with solutions that work with nature instead of against it, where that makes economic and environmental sense."*

# Examples for focus of WG Green Infrastructure

- **Green water retention infrastructures**
- **Green flood protection infrastructures**
- **Green buffer strips**
- **Constructed/functional wetlands**





Objective: to promote the development of innovative and effective green infrastructure solutions based on scientific evidence for local, regional, river basin and coastal environments.

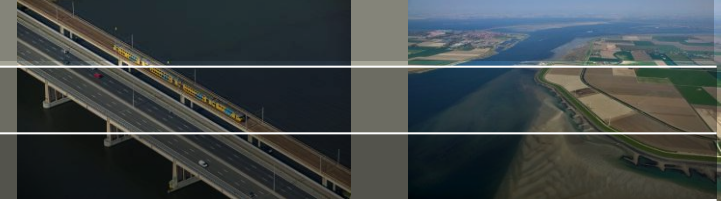
Vision: 'When ecological habitat is restored, make it functional' & 'When infrastructural works are designed, consider green infrastructure additions'

To successfully design and implement Green Infrastructures future knowledge development should focus on:

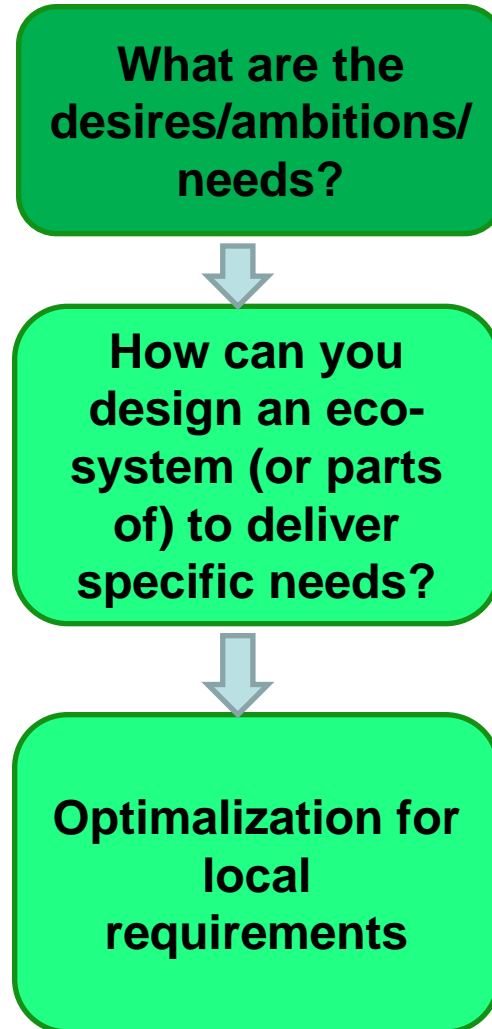
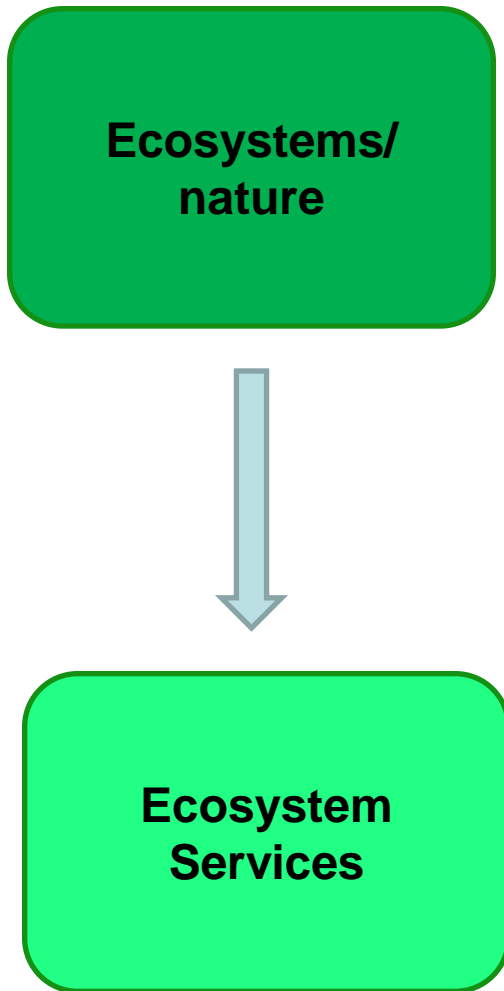
- Functional effectiveness,
- Governance & Business model, and
- Spatial design & Multi-functionality.



# Ecosystem services

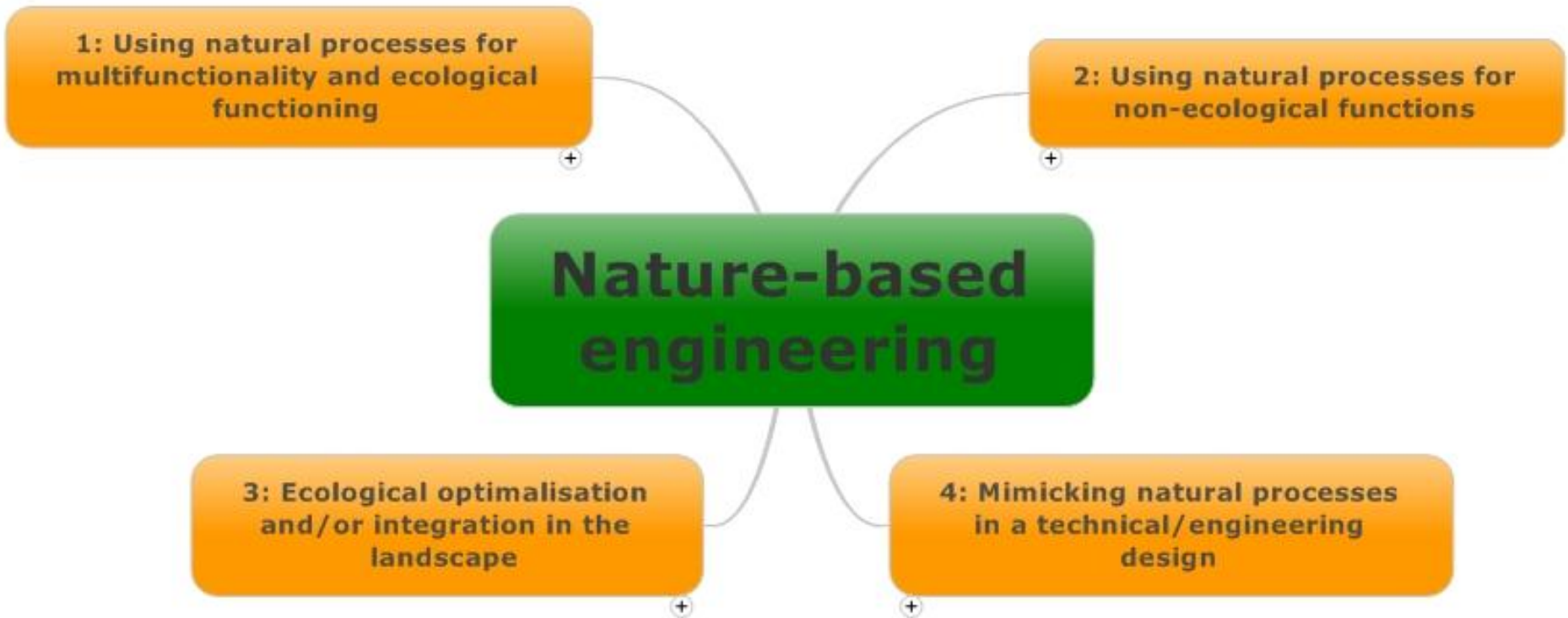


## Eco-dynamic design



# What is nature-based engineering?

For Deltares... 4 types

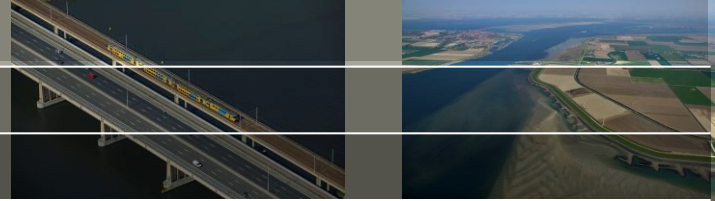


# Type 1





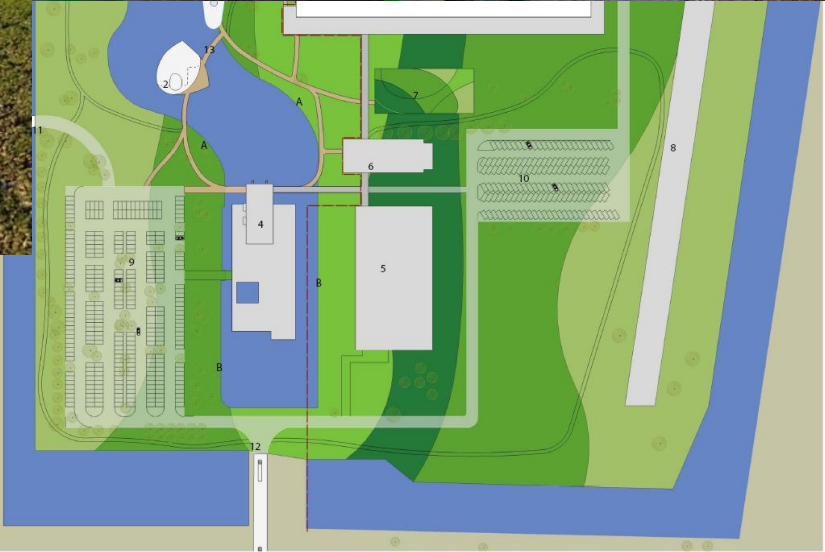
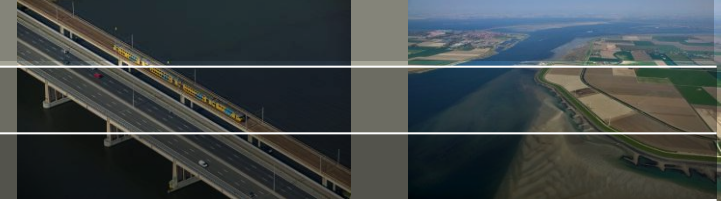
# Type 2



**Deltares**

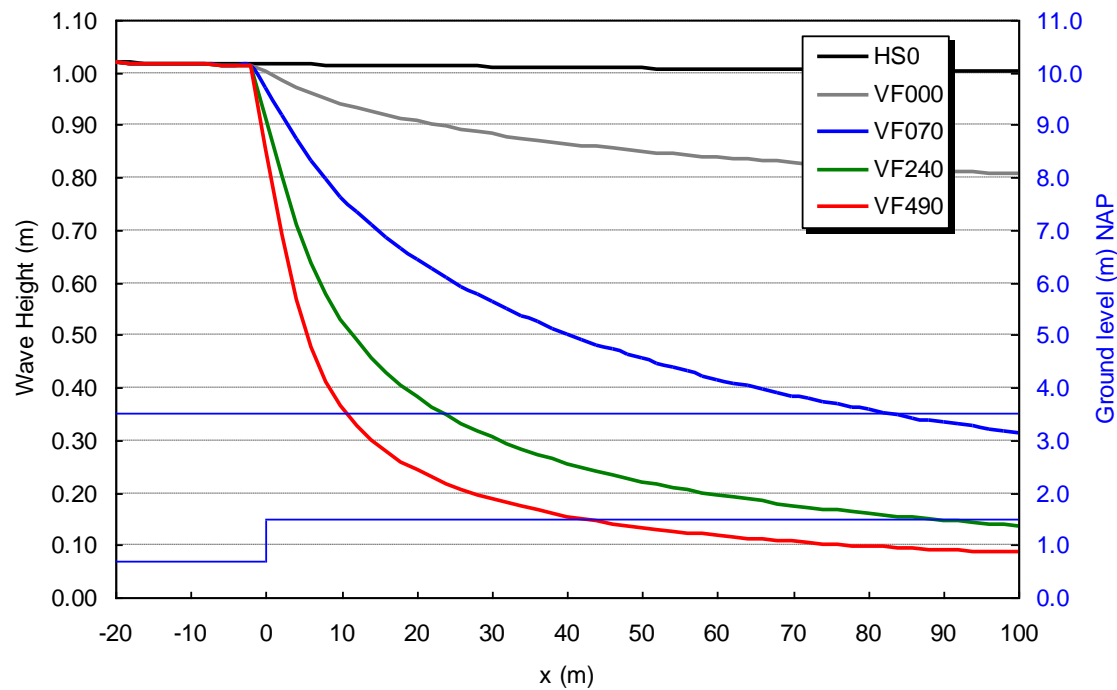


# Type 3



**Deltares**

# Intermediate solutions: willow wetlands



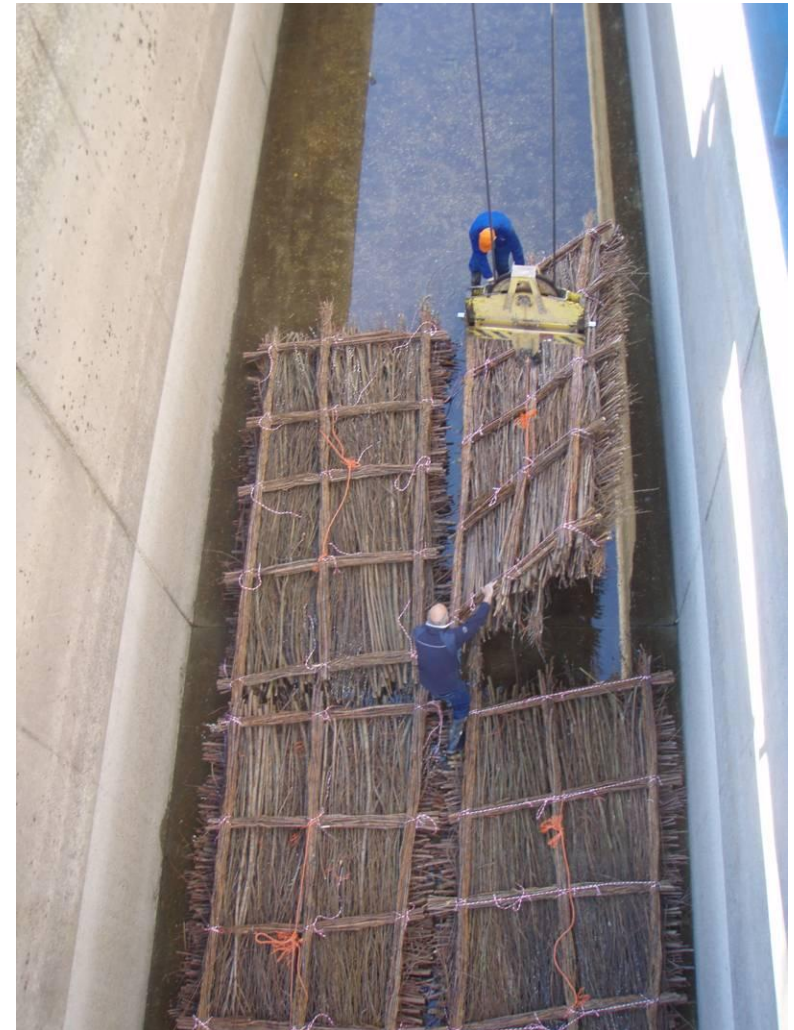


# Approach and proces: validate concepts



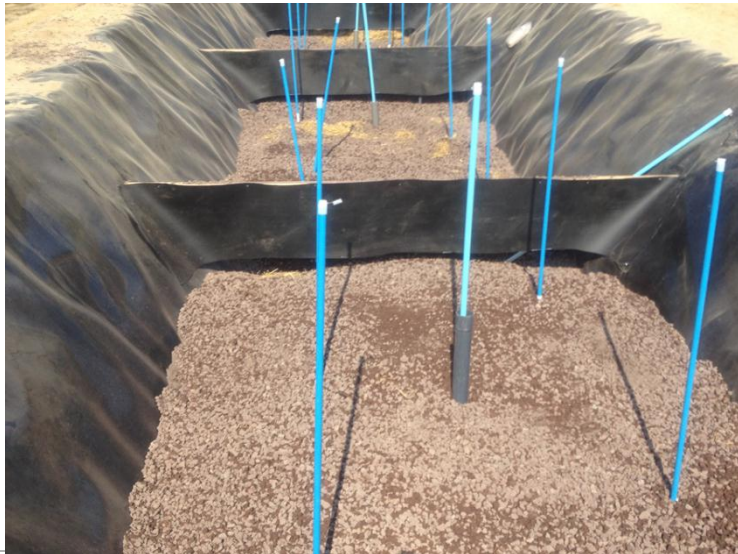


# Approach and proces: validate concepts





# Construction of purifying wetland





# Approach and proces: validate concepts





# Approach and proces: validate concepts





# Implementation of Nature-based solutions



- Show the functionality.
- Show the value for nature.
- Tell the story around.
- Check how to cope with local legacies.
- Be present at the very start of a spatial design process.
- Design a valid business case.
- Monitor so we can improve!



# Thank you!

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