

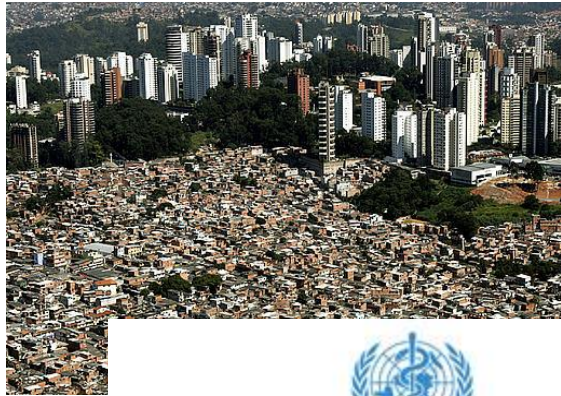
Building with Nature



EcoShape

building with nature

Why Building with Nature?



CLIMATE ACTION SUMMIT 2019



A RACE WE CAN WIN

6 CLEAN WATER AND SANITATION



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER

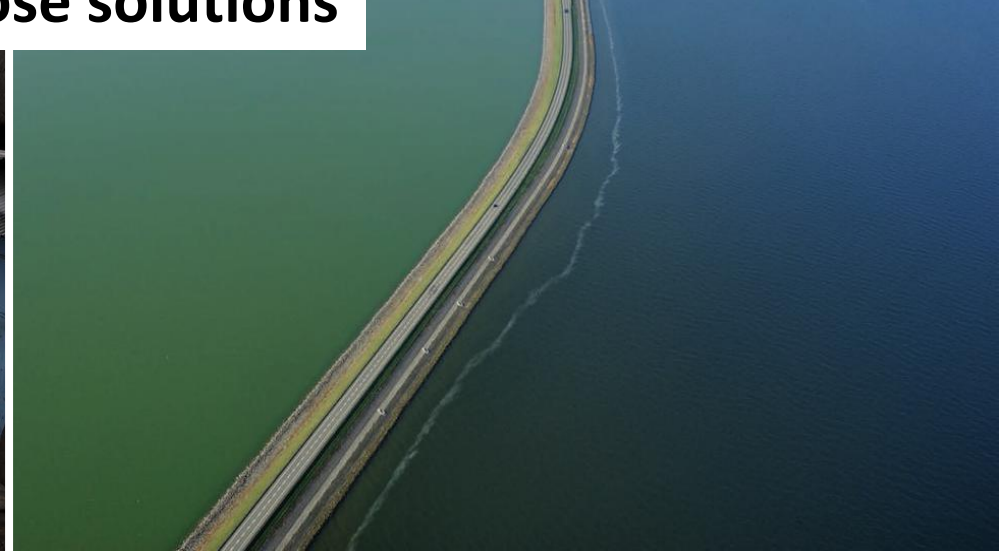


15 LIFE ON LAND





Single purpose solutions



Everything is connected

Wave regimes

Sediment
budgets

Subsoil-
conditions

Long shore
currents

Ecological
conditions

Water quality

Hydrologic flows

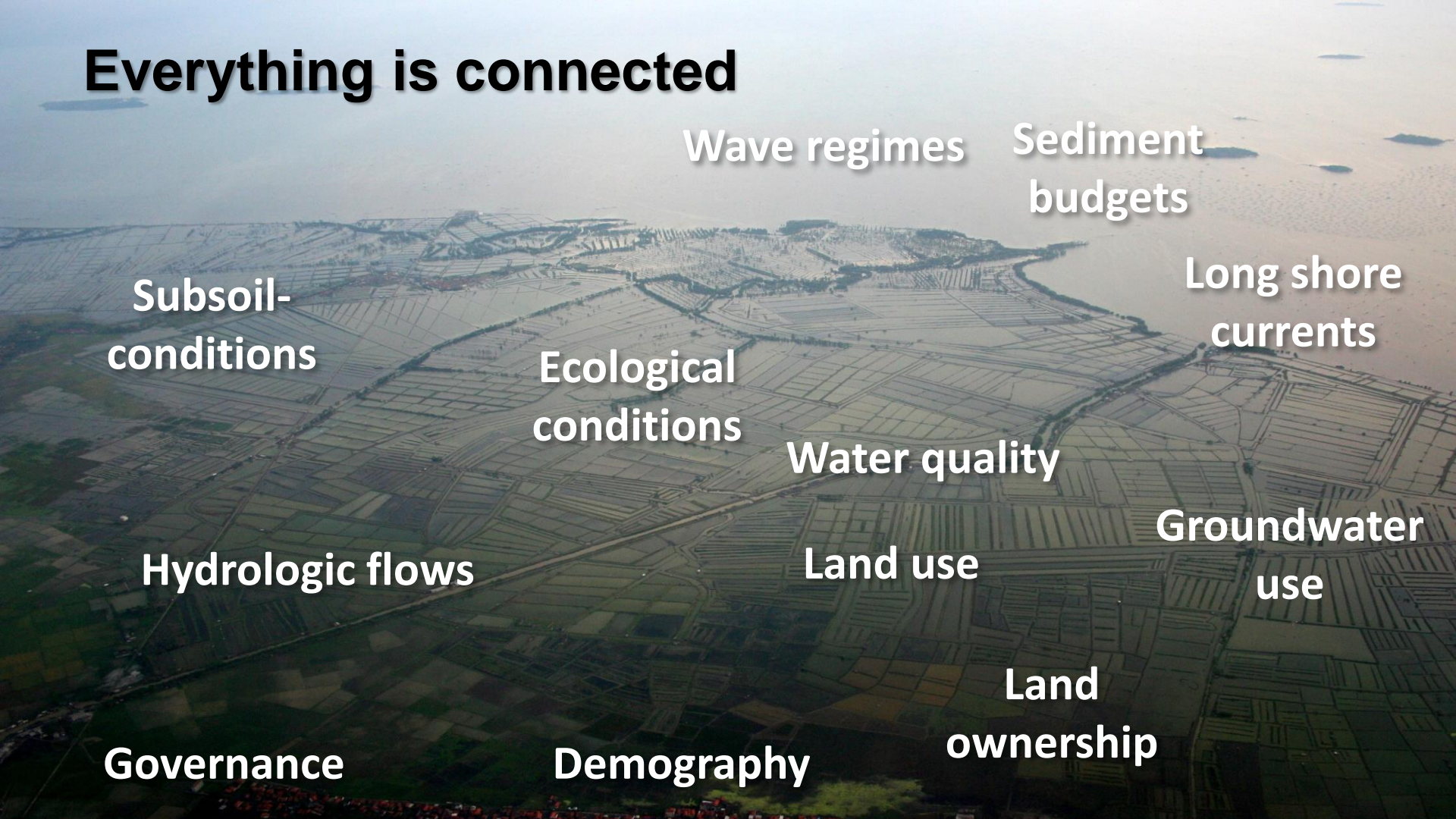
Land use

Groundwater
use

Governance

Demography

Land
ownership



Building with Nature: Motivation



Observations from the field

- More complex needs of our clients
- Traditional single-purpose vs multi-purpose solutions
- Lack of system understanding
- To tackle these global issues you need to reach scale?
- Increased complexity of permitting processes and stakeholder consultation
- Reactive approach in execution



Building with Nature - motivation

What if we are so focused on minimizing negative effects that we miss opportunities to maximize positive effects?



Need for transition



From Building *in* Nature

To Building *with* Nature



EcoShape consortium



Public Sector

Private Sector



Knowledge Institutions

NGO's



Our mission



Public Sector

Private Sector



- Develop **ecosystem knowledge** for infrastructure development
- Make the concept tangible using practical **BwN-examples**
- Develop scientifically sound **design rules and norms**
- Bring the BwN-concept forward in society and **make it happen**



Knowledge Institutions

NGO's



Themes

Nature Based Flood Defences



Ecosystem Restoration

Sustainable Port Development



Resilient Delta Cities

Pilot projects overview



Nature Based Flood Defences



Houtrib Dike Pilot Project



Sand Motor Delfland Coast



Hondsbosse Dunes



Sand engine lake IJssel



Interreg VB North Sea Region project Building with Nature



NatureCoast

Resilient Delta Cities



Werven Park Dordrecht



Tidal park Rotterdam



CityDeal Klimaadaptatie

Sustainable Port Development



Living Lab for Mud



Clay Ripening Pilot Project



Building with Nature in Indonesia



Salt marsh development Marconi Delfzijl



Mud Motor Koehoal salt marsh development



Marker Wadden KIMA

building with nature

Ecosystem Restoration

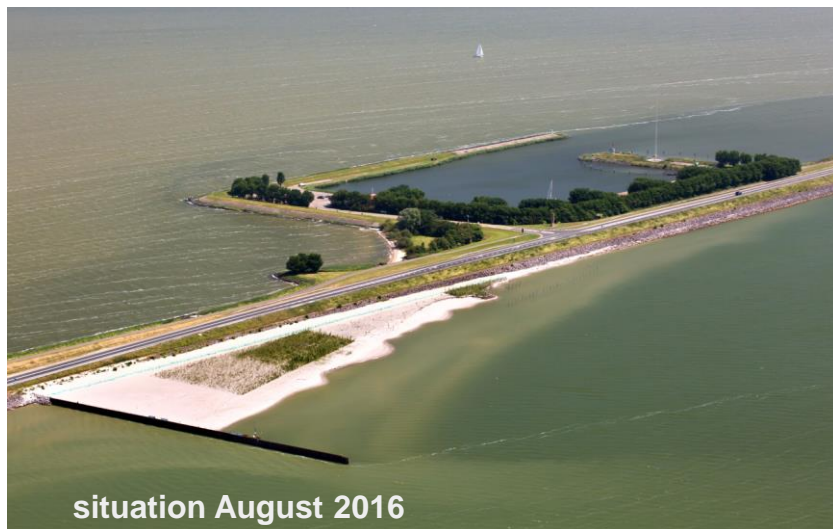
Sand Motor Delfland Coast

Project example: Nature Based Flood Defence



Houtrib Dike

Project example: Nature Based Flood Defences



Clay Ripening Pilot Project

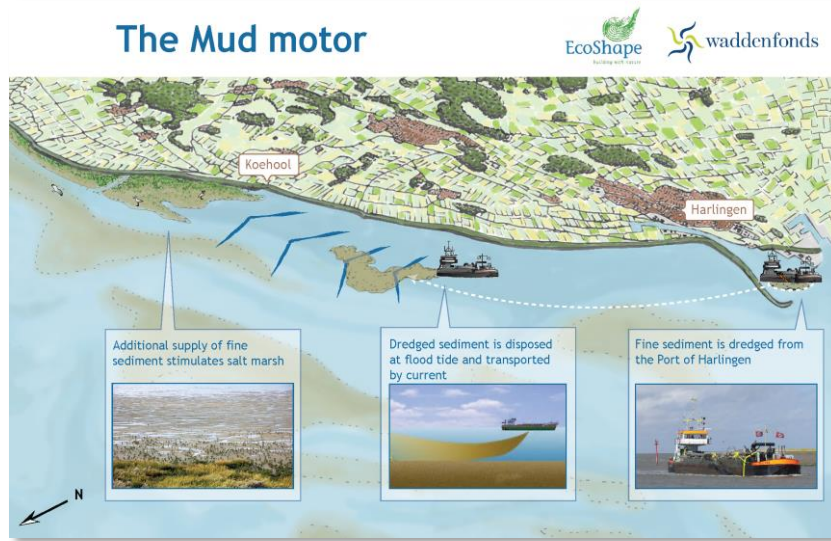


Project example: Sustainable Port development



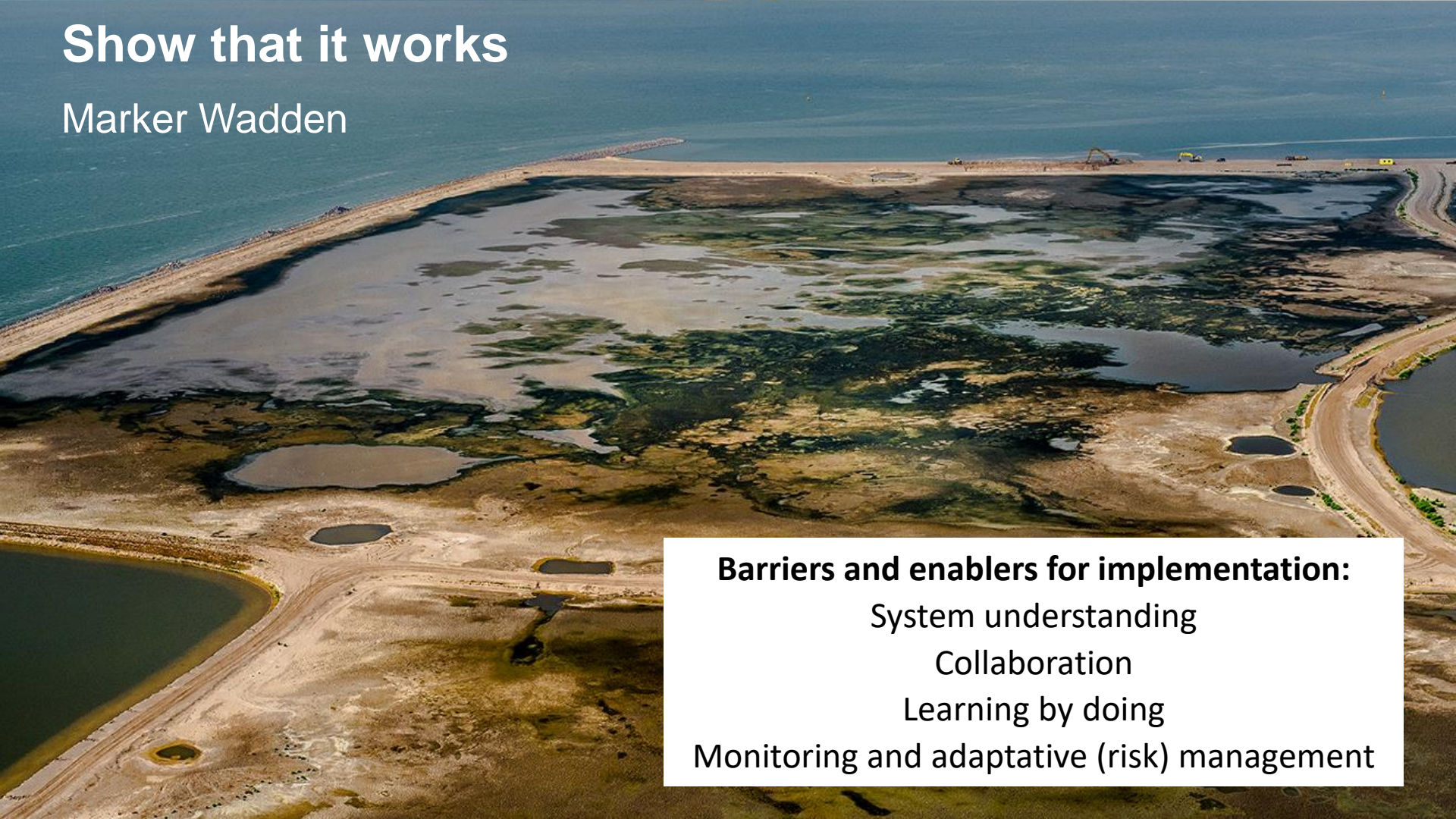
Mud Motor Koehoal

Project example: Sustainable Port development



Show that it works

Marker Wadden



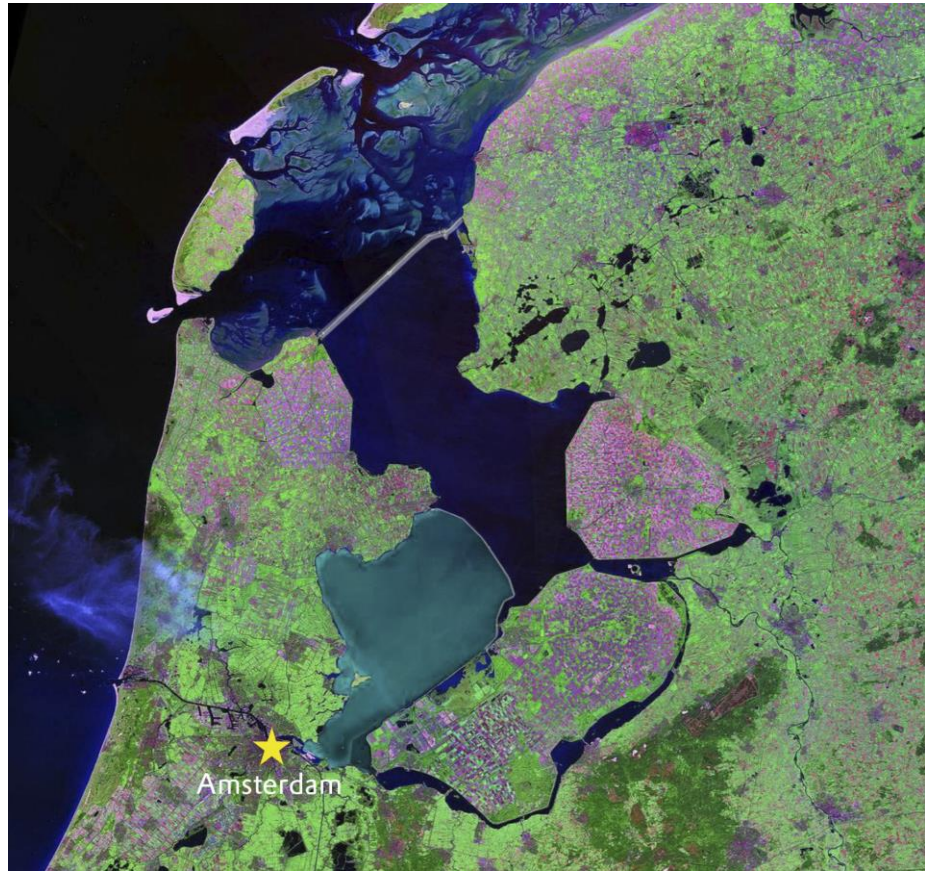
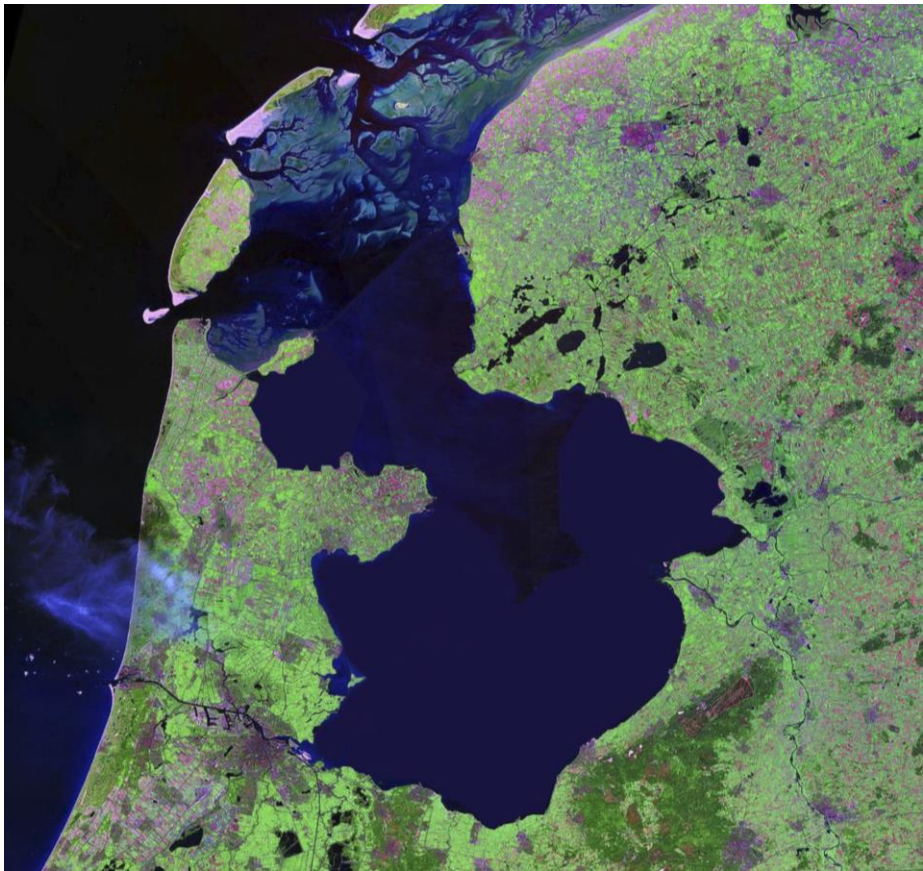
Barriers and enablers for implementation:

System understanding

Collaboration

Learning by doing

Monitoring and adaptive (risk) management



Why invest in Ecological restoration?

FOUR RETURNS ON INVESTMENT

1. Return of natural capital
2. Return of social capital
3. Return on financial investment
4. Return of inspiration



Natuurmonumenten

Marker Wadden: idea



Natuurmonumenten

Adaptive governance

- Public – private development
- Private owner
- Learning by doing!
 - Start without a clear end goal
 - Most effective construction method unclear
- Different tender approach: how to create as much nature for a fixed price?



First step

Objectives

- Bird paradise
- Improve water quality
- Welcome to visitors
- Room for innovation

Markermeer

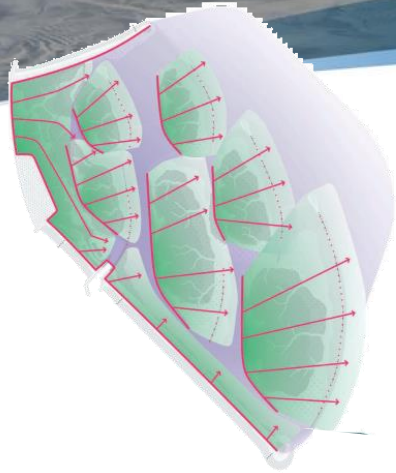
*Eerste fase
Marker Wadden*

Houtribdijk



Natuurmonumenten

Variation in soil – habitat – functions



Gradients

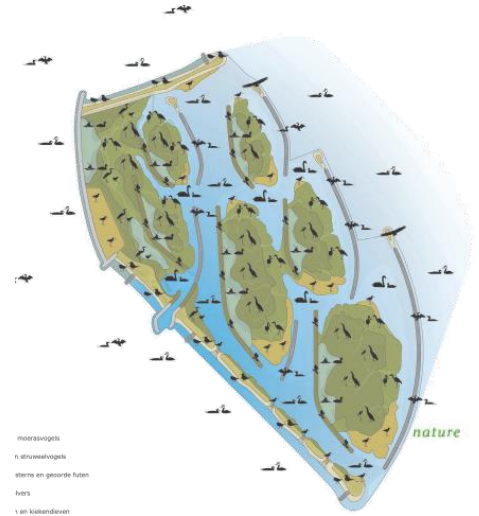


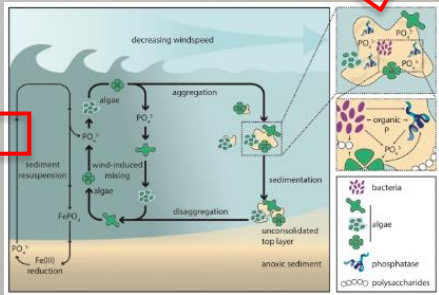
Habitats

Natural processes

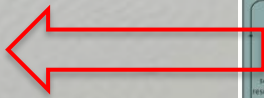


Birdspecies

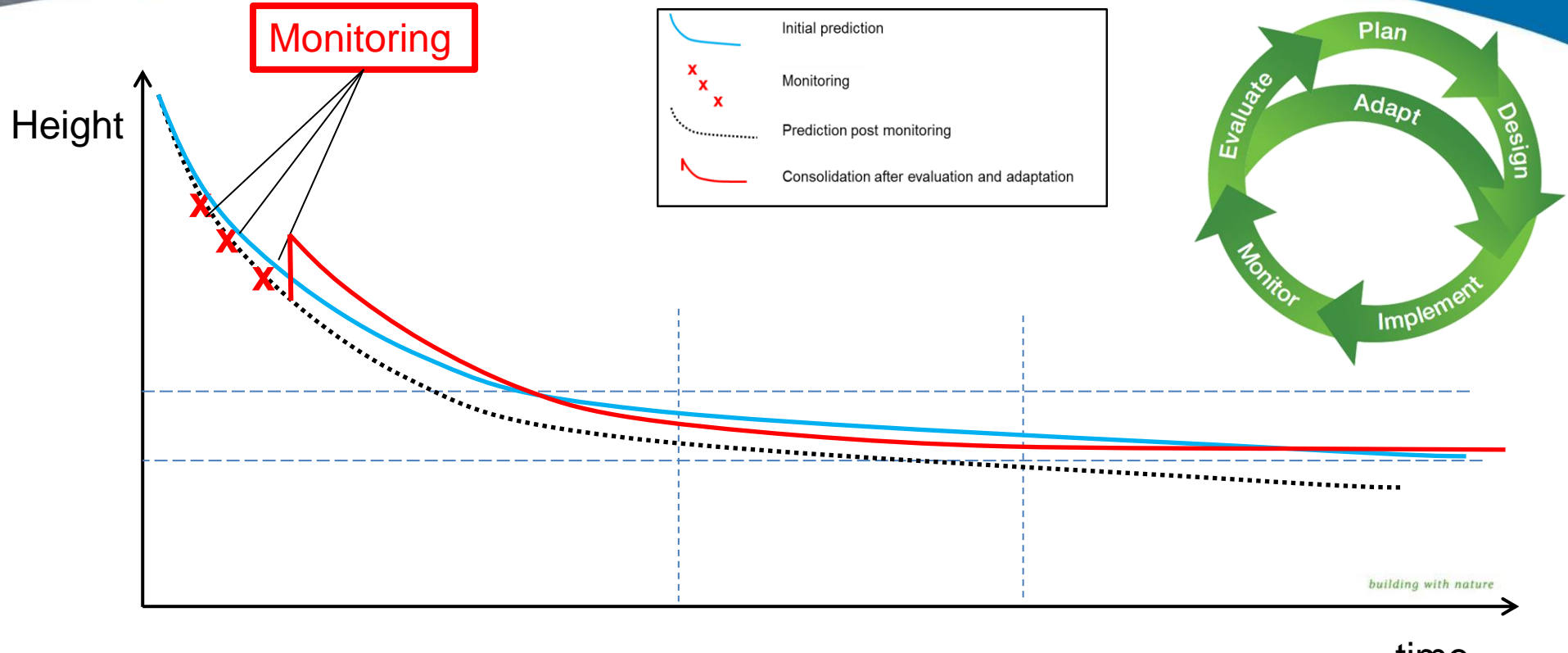




Building with Mud!!



Adaptive Management of Risks



22-03-2017



28-04-2017



28-07-2017



29-08-2017



29-08-2017



Learning by Doing – Knowledge Programme!



How to build with
Unsuitables?

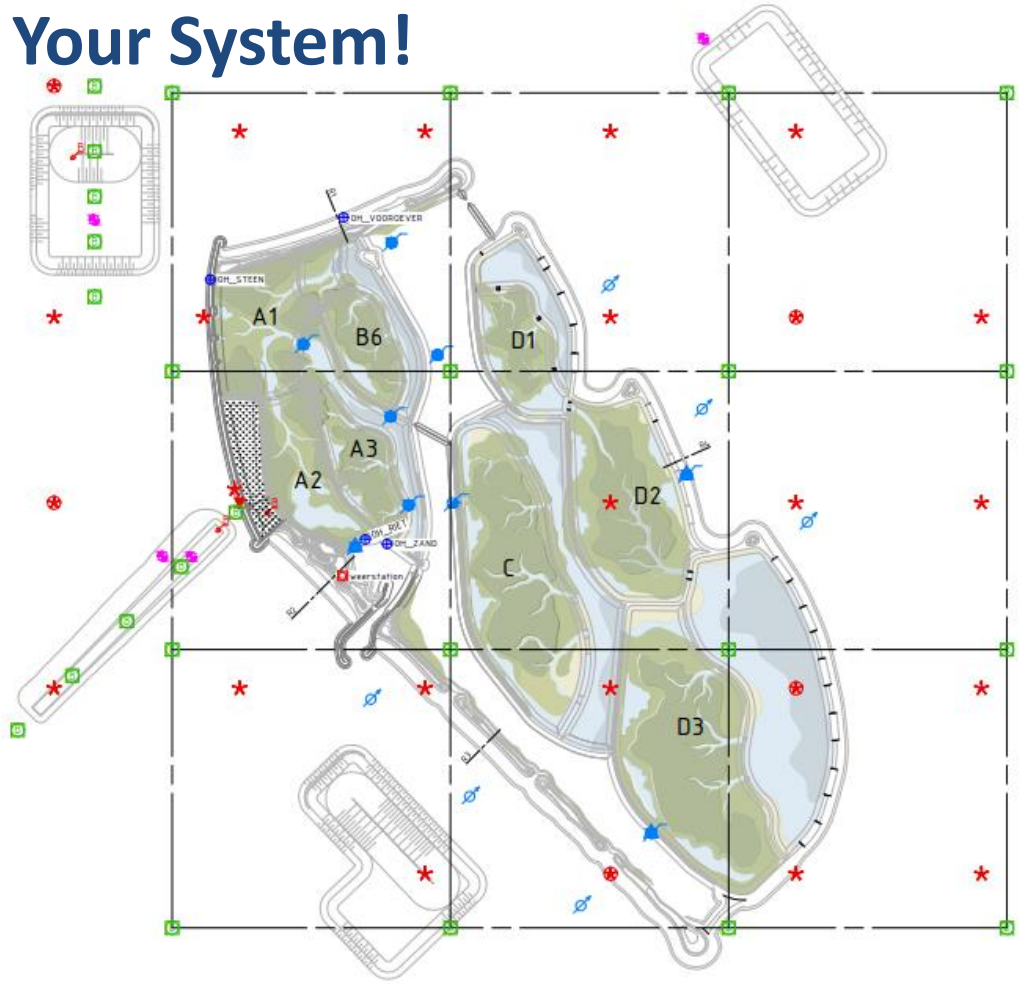


How to build of bird
paradise?



How to build with other
sectors?

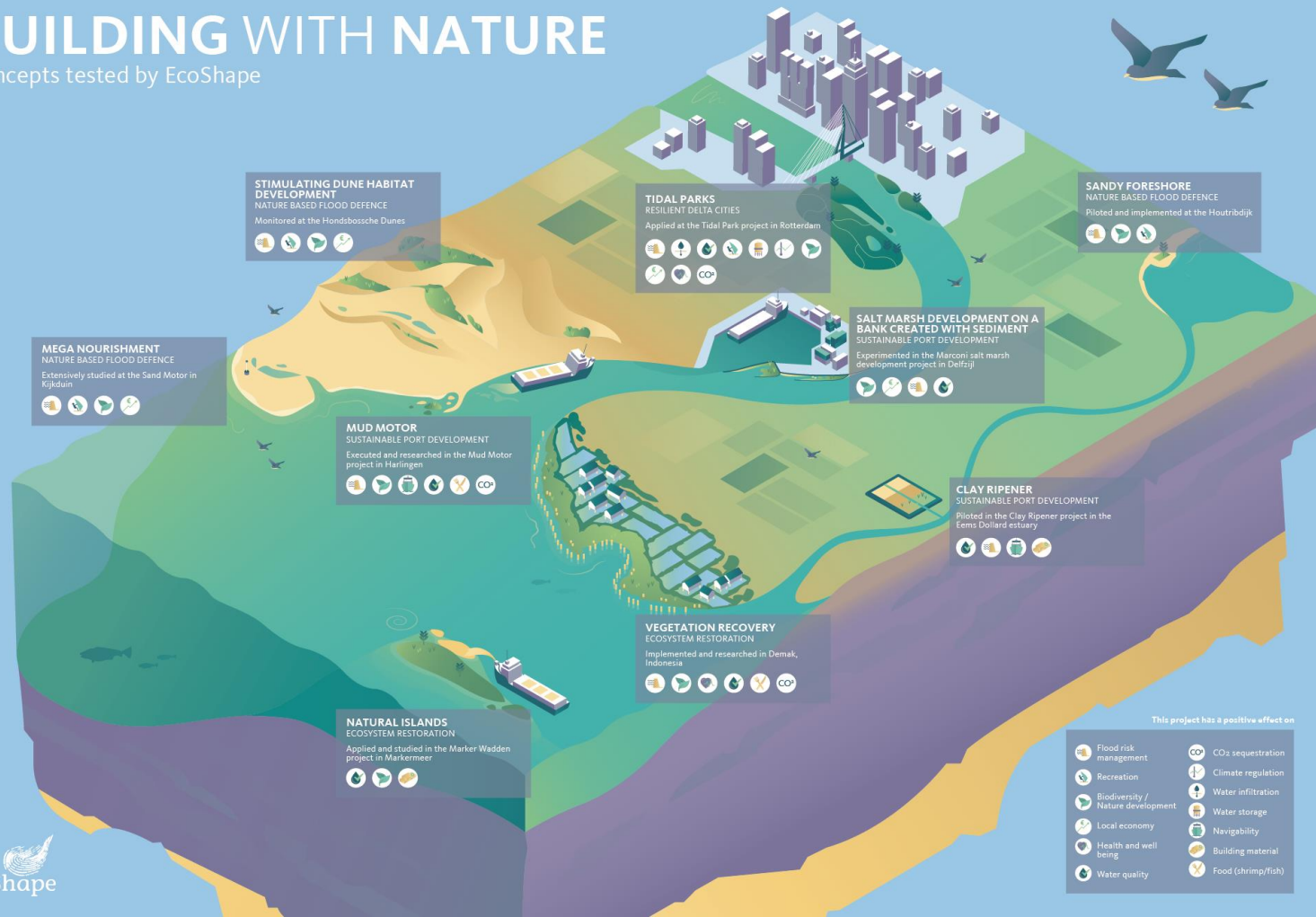
Know Your System!



- MWTL Vis
- MWTL biotoop macrofauna
- MWTL Waterplanten
- ▼ MWTL Mosselen
- ^{VP} Meetpaal waterkwaliteit
- ⊕ Flexibel meetframe
- ★ Slibmonster locatie
- ⊗ Slibmonster locatie met extra metingen
- ⊗^B Slibkarakterisering
- ┌ Meetraai met raainummer
- Minimeetpaal met alle loggers
- Minimeetpaal met waterkwaliteit loggers
- Minimeetpaal met waterpeillogger
- ⊕ Boei met waterkwaliteitloggers
- ◻ Weerstation
- Waterplanten veld
- ⓑ Benthos bemonsteringspunt
- - - Meetraai benthos monsterpunten
- ⊘ meetpaal
- ⊘ Vegetatieonderzoek

BUILDING WITH NATURE

Concepts tested by EcoShape



STIMULATING DUNE HABITAT DEVELOPMENT
NATURE BASED FLOOD DEFENCE
Monitored at the Hondsbossche Dunes



TIDAL PARKS
RESILIENT DELTA CITIES
Applied at the Tidal Park project in Rotterdam



SANDY FORESHORE
NATURE BASED FLOOD DEFENCE
Piloted and implemented at the Houtribdijk



MEGA NOURISHMENT
NATURE BASED FLOOD DEFENCE
Extensively studied at the Sand Motor in Kijkduin



SALT MARSH DEVELOPMENT ON A BANK CREATED WITH SEDIMENT
SUSTAINABLE PORT DEVELOPMENT
Experimented in the Marcon salt marsh development project in Delfzijl



MUD MOTOR
SUSTAINABLE PORT DEVELOPMENT
Executed and researched in the Mud Motor project in Harlingen



CLAY RIPENER
SUSTAINABLE PORT DEVELOPMENT
Piloted in the Clay Ripener project in the Eems Dollard estuary



VEGETATION RECOVERY
ECOSYSTEM RESTORATION
Implemented and researched in Demak, Indonesia



NATURAL ISLANDS
ECOSYSTEM RESTORATION
Applied and studied in the Marker Wadden project in Markermeer



This project has a positive effect on

- Flood risk management
- Recreation
- Biodiversity / Nature development
- Local economy
- Health and well being
- Water quality
- CO2 sequestration
- Climate regulation
- Water infiltration
- Water storage
- Navigability
- Building material
- Food (shrimp/fish)

We are not alone, but...



Working with Nature
PIANC



Building with Nature
EcoShape



Engineering with Nature
US Army Corps of Engineers



Green Infrastructure
European Commission



Nature Based Solutions Initiative
Oxford University



thinknature

Think Nature
EU programme



THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

Nature Based Solutions
World Bank

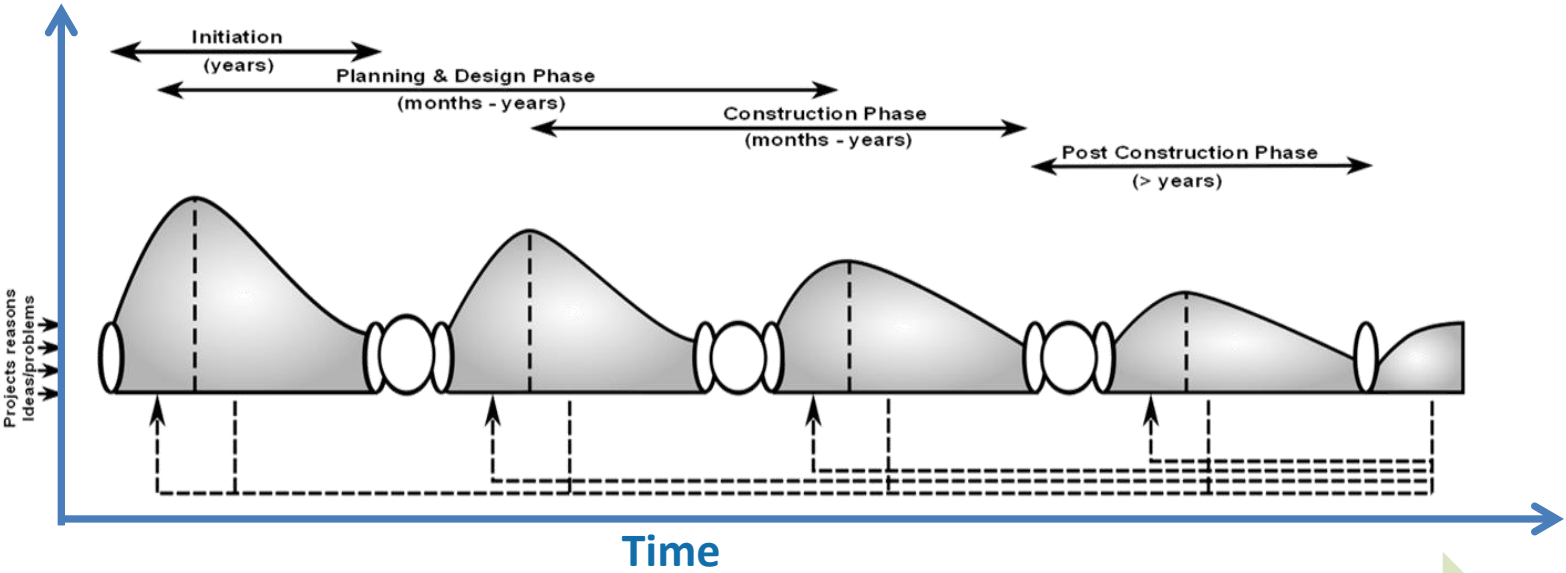


Working with Natural Processes
Environment Agency (UK)

Building with Nature = implementation



Design freedom



Building with Nature



BUILDING WITH NATURE

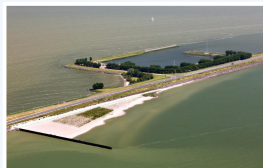
Concepts tested by EcoShape

Lessons learned: Key enablers for Building with Nature

SHARE RISKS TO REACH SCALE

PARTNERSHIPS

BUSINESS CASE



STIMULATING DUNE HABITAT DEVELOPMENT
NATURE-BASED FLOOD DEFENCE
Monitored at the Hondeloose Duinen

- 1
- 2
- 3
- 4

TIDAL PARKS
RESILIENT DELTA CITIES
Applied at the Tidal Park project in Rotterdam

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

SANDY FORESHORE
NATURE-BASED FLOOD DEFENCE
Pilot and implemented at the Houtduin

- 1
- 2
- 3
- 4

SALT MARSH DEVELOPMENT ON A BANK CREATED WITH SEDIMENT
NATURE-BASED FLOOD DEFENCE
Experimented in the Maroon salt marsh development project in Delfzijl

- 1
- 2
- 3
- 4

MUD MOTOR
SUSTAINABLE PORT DEVELOPMENT
Executed and researched in the Mud Motor

- 1
- 2
- 3
- 4
- 5

RIPEPER
NATURE-BASED FLOOD DEFENCE
in the City Ripeper project in the island of Riep

- 1
- 2
- 3
- 4

ISLANDS
RESTORATION
Pilot in the Marker Wadden

- 1
- 2
- 3
- 4



- 1. Flood risk
- 2. Recreation
- 3. Biodiversity / Nature development
- 4. Local economy
- 5. Health and well-being
- 6. Water quality
- 7. Water infiltration
- 8. Water storage
- 9. Navigability
- 10. Building material
- 11. Food (phosphorus)

A photograph of a mangrove forest on a sandy beach. The trees have dense green foliage and prominent, exposed roots extending into the sand and shallow water. The sky is clear and blue.

Thank you for your attention

The EcoShape logo consists of a stylized green leaf or wave shape made of concentric lines.

EcoShape

Contact: Fokko.vandergoot@ecoshape.nl

For more info visit www.ecoshape.nl

 [@EcoShapeBwn](https://twitter.com/EcoShapeBwn)

 [EcoShape](https://www.linkedin.com/company/ecoshape)

building with nature