Rijkswaterstaat
Ministerie van Infrastructuur en Milieu

CCA, Dutch national strategy, policies and actions

Pieter de Boer
(RWS, The Netherlands)

Dutch national strategy, policies and actions

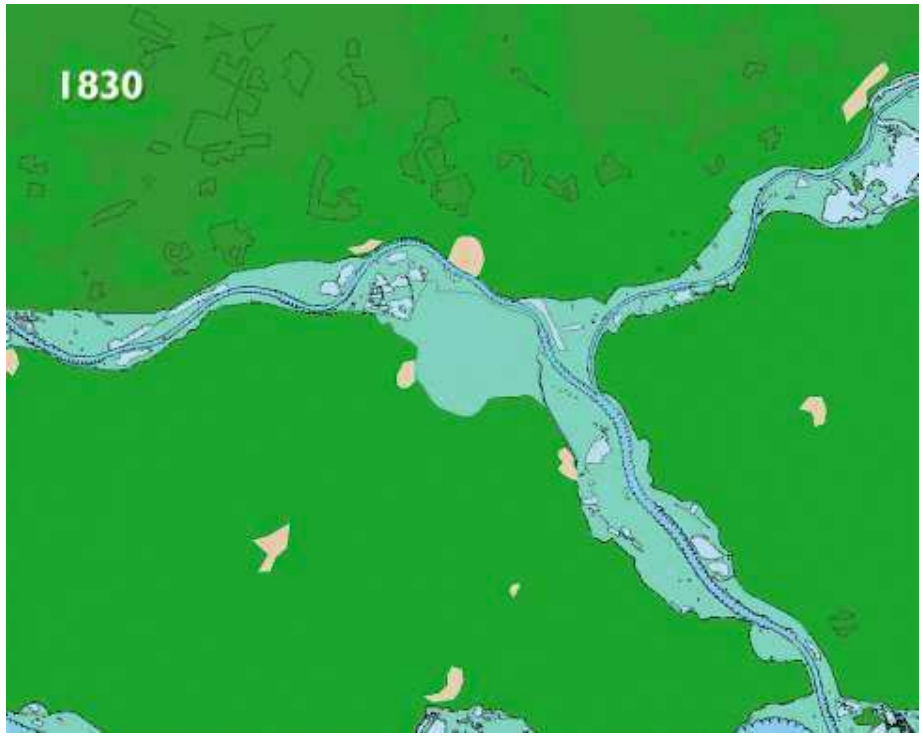
Content:

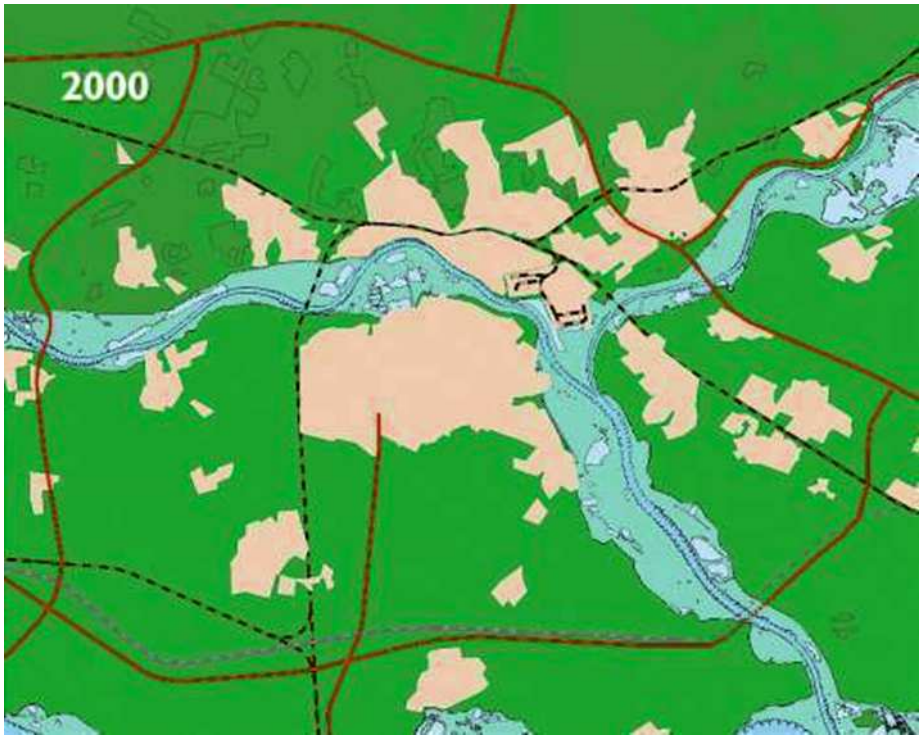
- 1. Main known threats to the Dutch coasts and rivers
- 2. Measures we are considering and taking
- 3. Use of forces of nature (Building with Nature) and the CCA measures
- 4. Application of the ecosystem's approach in CCA measures in coastal, estuarine and fluvial environments
- 5. Possibility for win-win-win solutions (positive economical, societal and ecological impacts)
- 6. Conclusions

1. Main known threats to the Dutch coasts and rivers

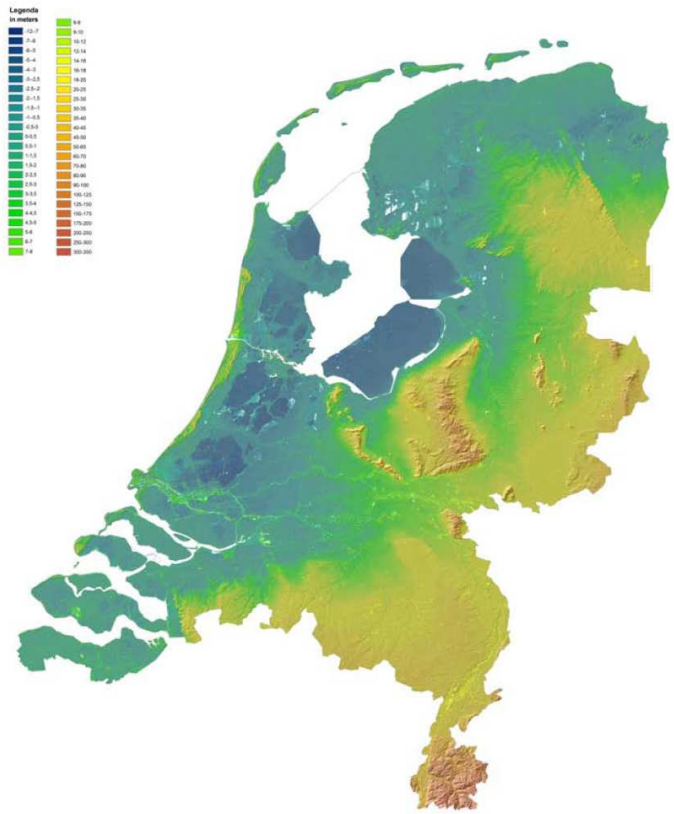
- Sea Level Rise
- Subsidence of the land
- More periods of heavy rainfall
- Temperature is rising, drier summers
- More serious impact of flooding nowadays

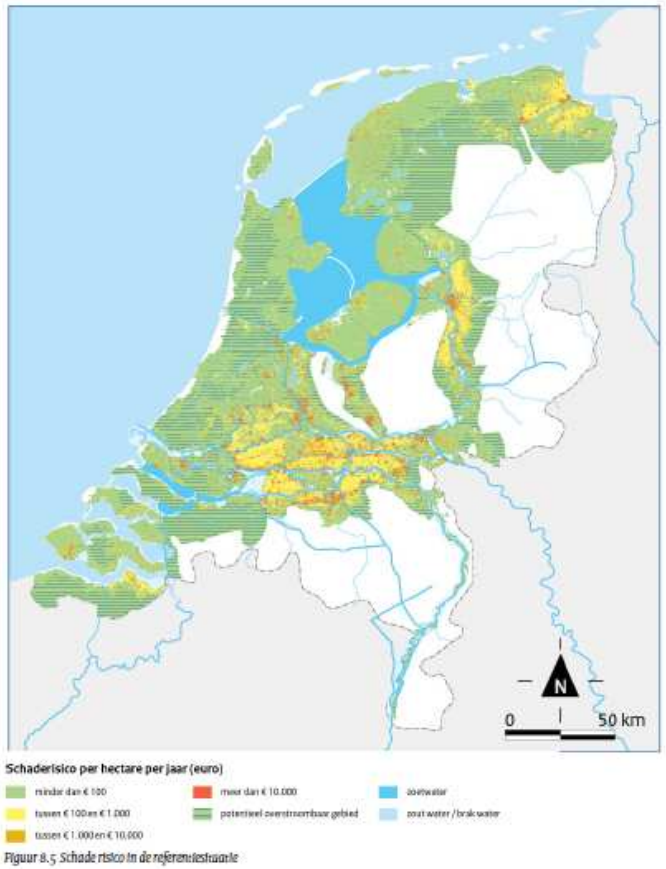
Urbanization has resulted in less and less space for water (Arnhem)





Risk for flooding and damage





Figuur 8.5 Schade risico in de referentiesituatie

2. Recommendations Delta Comission (2008)

- The Delta Commission made 12 recommendations, covering the following issues:
  - new standards for dike construction;
  - whether or not to build in low-lying, flood-prone areas;
  - vulnerable areas in greatest need of action: the North Sea coast, the Wadden Sea area, the Southwest Delta, the central delta, the Rotterdam area (Rijnmond), and the IJsselmeer region;
  - how to organise the political, administrative and financial aspects of flood protection.
- Following the Commission's main recommendation, a new Delta Act was introduced. This law:
  - obliges the government to update the Delta Programme every year;
  - sets out the agreements for financing the Delta Programme.

2. The Delta Programme

- The aim of the Delta Programme is to ensure that the Netherlands remains a safe place to live, with a favourable business climate.

- The Delta Programme is aimed at:
  - protecting the Netherlands against flooding, now and in the future;
  - ensuring sufficient freshwater supplies.

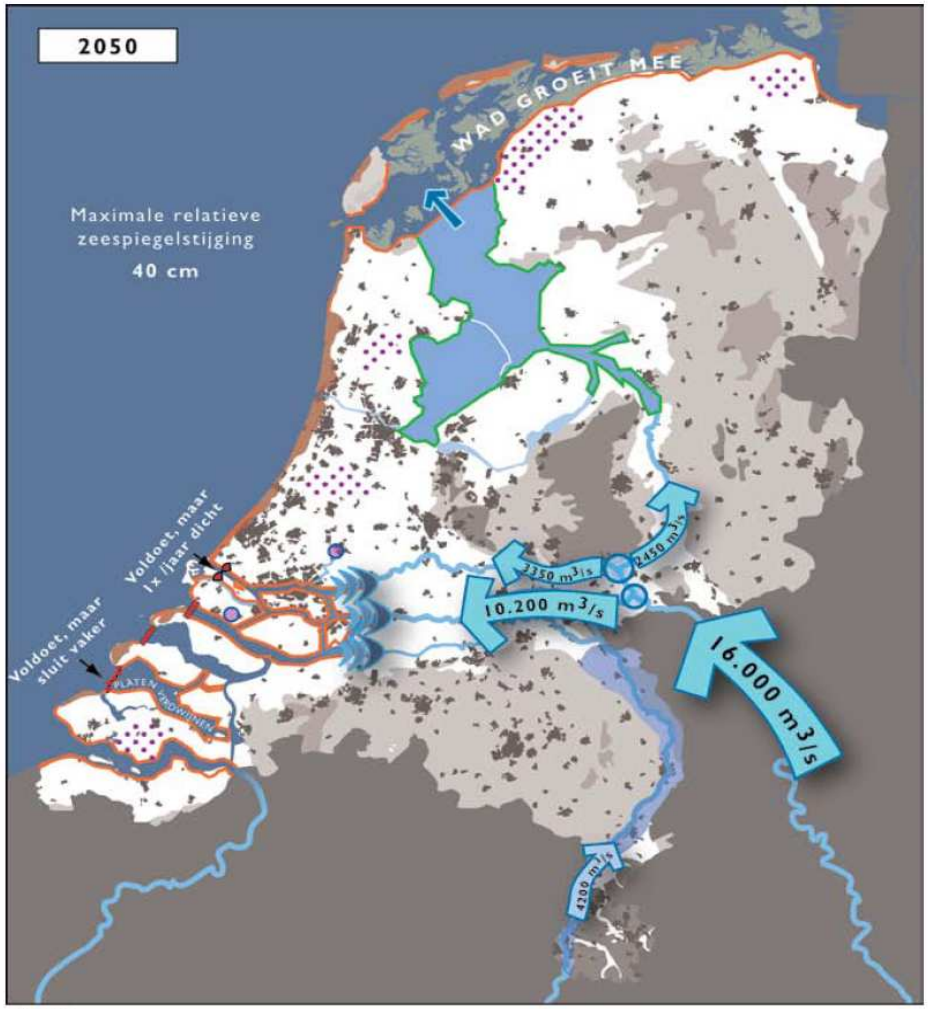
- To deal with the combination of higher temperatures, ground subsidence and the rising sea level, effective **long-term planning is necessary**. The government has responded by setting out concrete measures in the Delta Programme, which is updated every year.

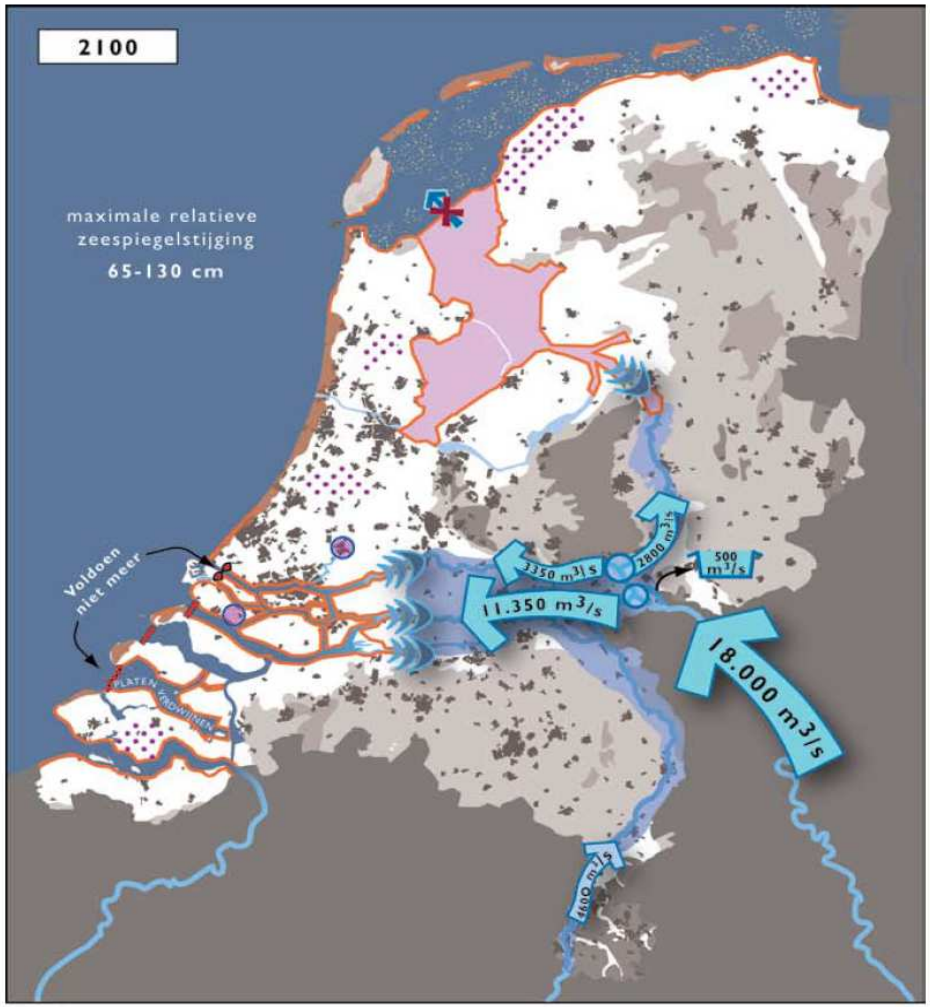
- 1 billion Euro's a year

2. The Delta Programme

- 7 Area's

- 3 Theme's (sub-programs)
  - Safety
  - Freshwater supply
  - Spatial Adaptation (a.o realignment)


2050
WAD GROEIT MEE
Maximale relatieve zeespiegelstijging
40 cm
Voldoet, maar sluit vaker
Voldoet, maar 1x /jaar dicht
3350 m3/s
2450 m3/s
10.200 m3/s
16.000 m3/s
4390 m3/s
PLATEN VAN FLAKKEE
Legenda
Spuien onder vrij verval mogelijk
Zoetwatervoorraad IJsselmeergebied te beperkt
Invloedsgebied zee verschuift rivieropwaarts
Aandacht voor hoogte en stabiliteit dijken
Aandacht voor hoogte en afslag duinen
Zoetwaterinname Bernisse en Gouda moet vaker gestaakt worden
Overstromingskansen Maas nemen toe
Zoute kwel
0 km
50 km
N


2100
maximale relatieve zeespiegelstijging
65-130 cm
Voldoen niet meer
3350 m3/s
2800 m3/s
500 m3/s
11.350 m3/s
18.000 m3/s
4390 m3/s
PLATEN VAN FLAKKEE
Legenda
Zonder peilopzet spuien onder vrij verval niet langer mogelijk
Zoetwatervoorraad beperkt / aandacht voor beperkte mogelijkheid tot spuien
Invloedsgebied zee verschuift rivieropwaarts
Aandacht voor hoogte en stabiliteit dijken
Aandacht voor hoogte en afslag duinen
Zoetwaterinname Bernisse en Gouda moet vaker gestaakt worden
Overstromingskansen rivieren nemen toe
Zoute kwel
Retentiegebied rivierwater
0 km
50 km
N

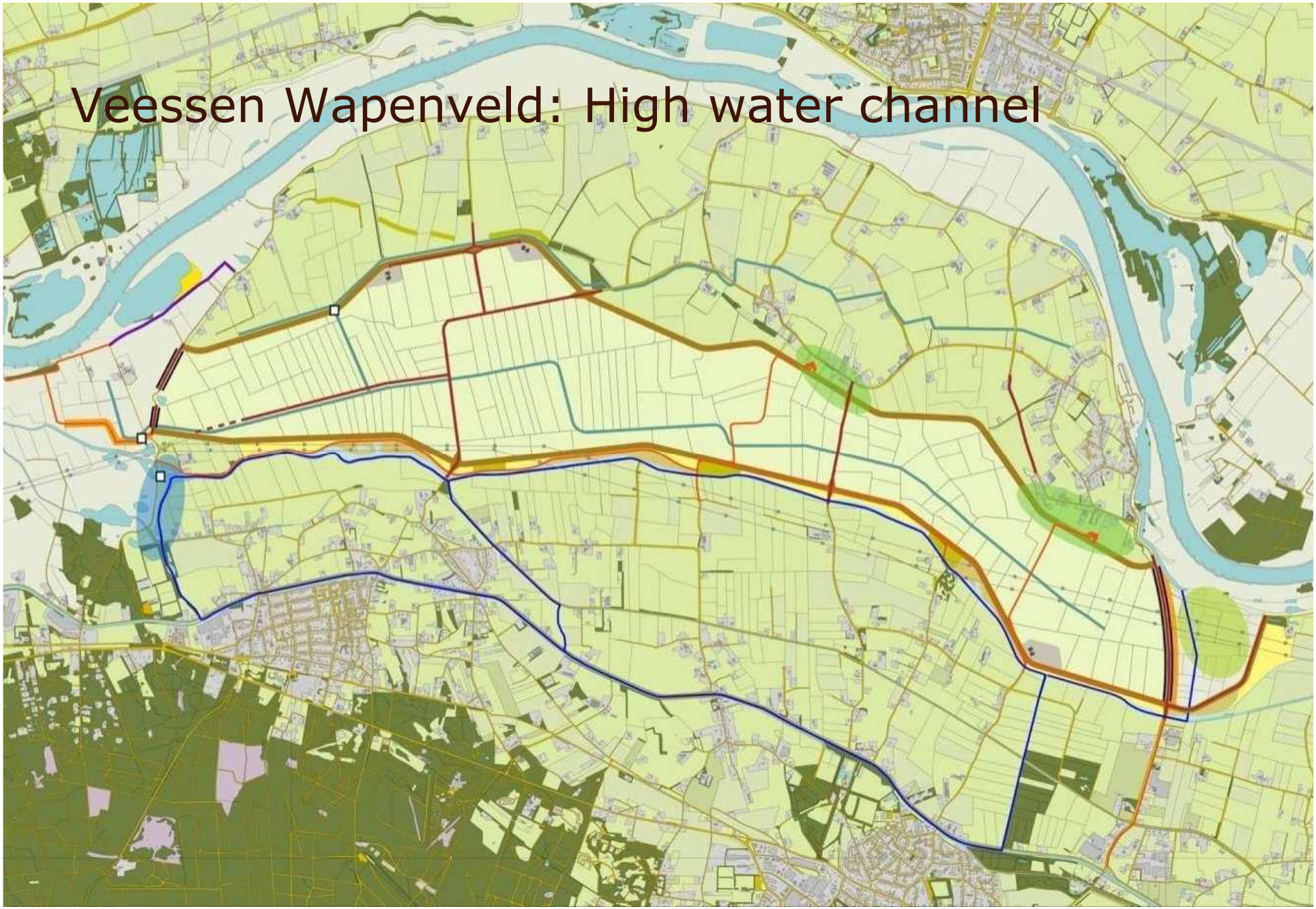
2. Room for the River Programme and the River Maas programmes (2007 – 2015)

- After the floods of 1993 and 1995, the government introduced various measures to improve water safety along the Rhine and its offshoots and the River Maas. New levels of protection apply to the Rhine. **This means that by 2015, the river must be able to discharge 16,000 cubic metres of water per second at Lobith.**

- The River Maas programmes are being carried out along the stretches of the Maas near the Dutch-Belgian border under the headings Zandmaas and Grensmaas. The work is designed to improve flood protection, enhance the natural surroundings and accommodate shipping more effectively.

Room for the River program project area with the 38 projects

Veessen Wapenveld: High water channel



Noordwaard Depoldering

Biobuilders; Water reducing forest-dike combi “fort Steurgat”

Clay dike
will be lower than
traditional design

100m wide

Wave reducing
willow-tree plantations
Low cost low tech

-1550 euro cheaper per meter, 2 euro per meter management more expensive

- 80% wave reduction: dike 1m below norm

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

2. Delta-decisions (2014)

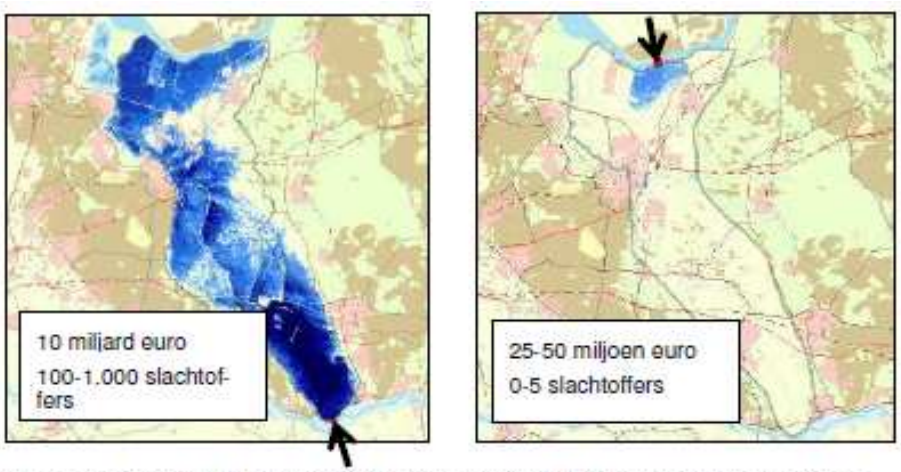
- Watersafety (standards, minimalisation of consequences of flooding)
- Freshwater Strategy
- Spatial Adaptation
  - Incorporate the impact of new infrastructure on floodings, and the climate (city's) in decision-making
- Area of Lake IJssel
  - Discharge to Waddensea
  - Flexibility of the water level
- Decision on the Rhine Meuse Delta

Beach nourishment

- To strengthen the coastal defences, the sand level is being replenished.
- Protection of the “coastal-fundament”

BWN-pilot: Sand Engine.

New standards for water safety (Dike Construction)



Figuur 6.1 Verschil in gevolgen bij dijkring Gelderse Valle[illegible] tussen een doorbraak van de Grebbedijk in het zuiden (links) en een dijkdoorbraak bij de randmeren aan de noordzijde (rechts)

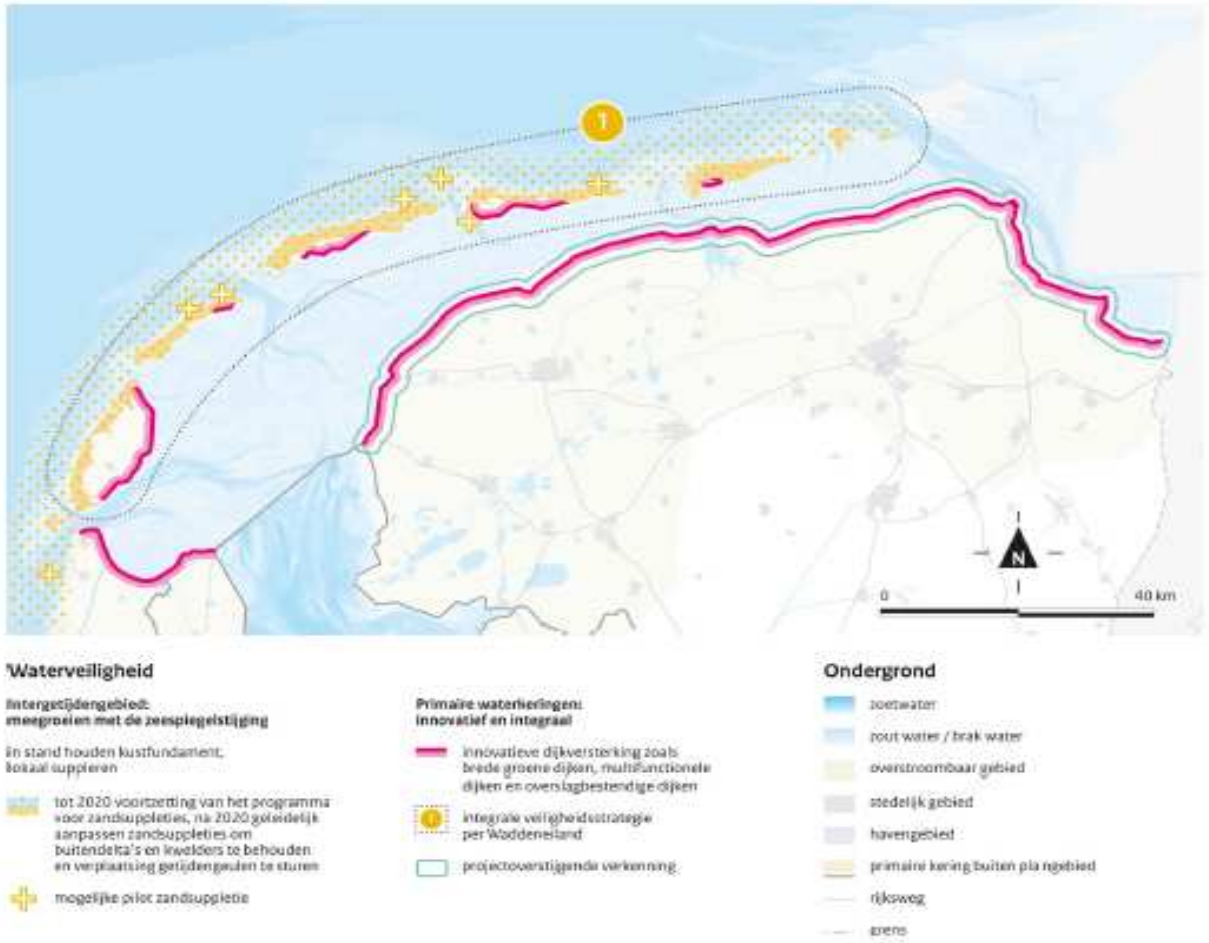
Normvoorstel Waterveiligheid

Overstromingskans per jaar

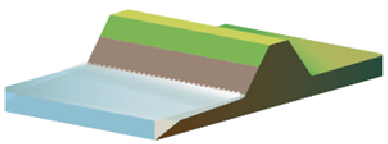
- 1/300
- 1/1.000
- 1/3.000
- 1/10.000
- 1/30.000
- 1/100.000

Figuur 8.1 Maximaal toelaatbare overstromingskansen voor primaire waterkeringen conform Deltaprogramma 2015

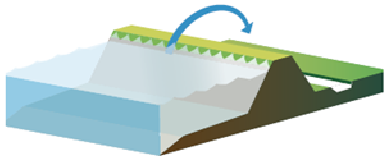
Strategy Waddensea



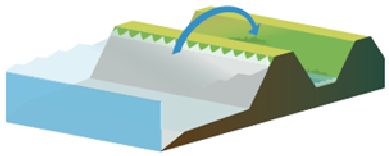
Six innovative dike concepts POV Waddensea



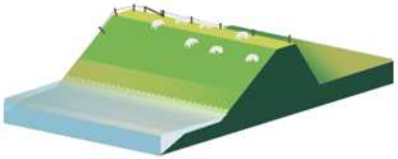
1.Deltadijk



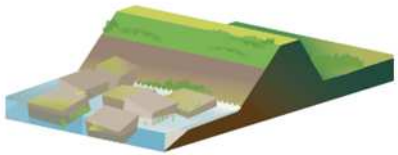
2.Overslagbestendige dijk



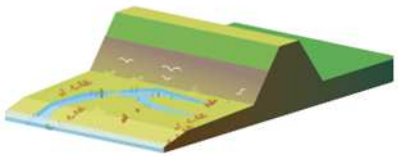
3. Dubbele dijk



4.Brede Groene dijk



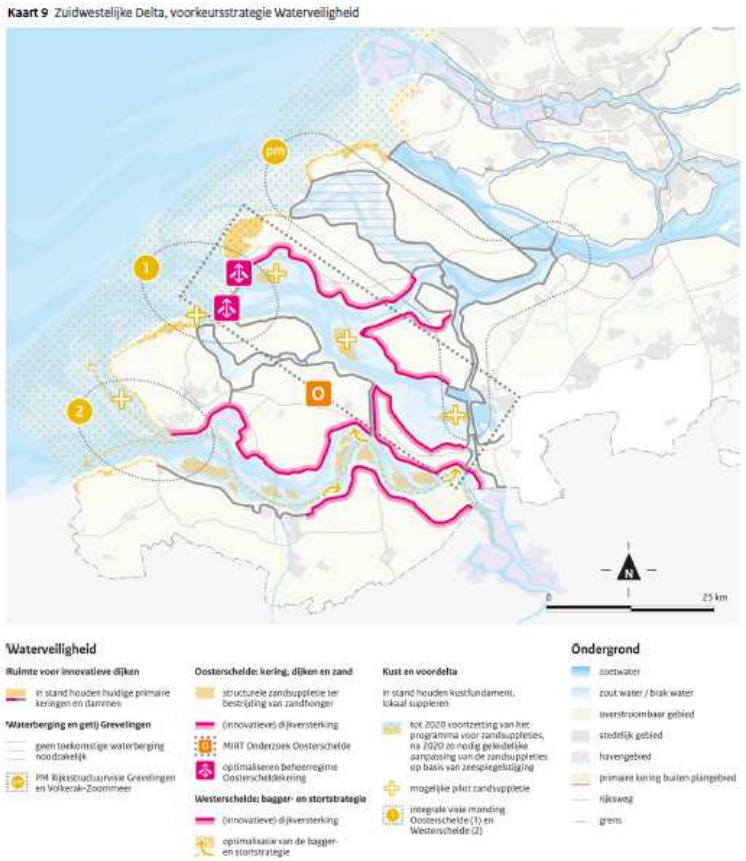
5. Rijke Dijk



6. Dijk met kwelder

Work on the Southwest Delta

- The Southwest Delta includes the province of Zeeland, the South Holland Islands.
  The aim is to ensure that:
  - the Southwest Delta is ready for the effects of climate change;
  - natural values are adequately protected;
  - the area continues to thrive economically.



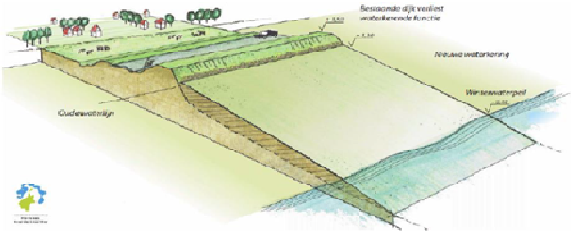
3. Design of BwN measures has to be done case by case

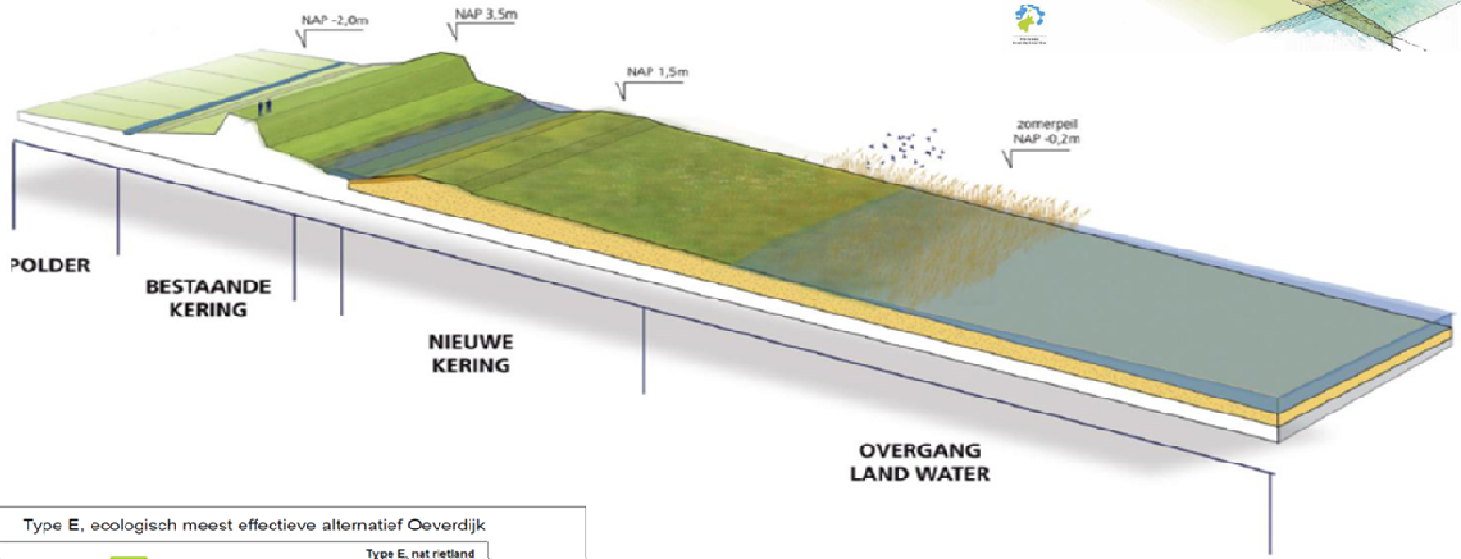
Figure 1: Range of potential BwN applications along the main axes of given bed slope and hydrodynamic energy. Of course factors like salinity and geo-climatic region also detemine potential solutions.

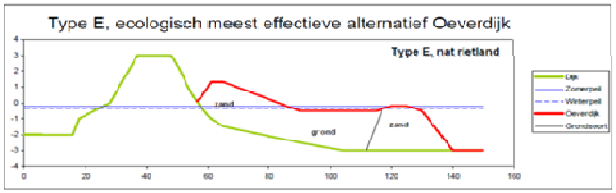
4. Ecosystem Services for Safety against flooding

- Reduction of wind speed
- Stabilisation of sediment
- Increase in sedimentation
- Reduction of erosion
- Wave attenuation
- Reduction of currents
- Physical barrier

5. “Shore-dike” (HHNK) 2010-2020 (win-win)

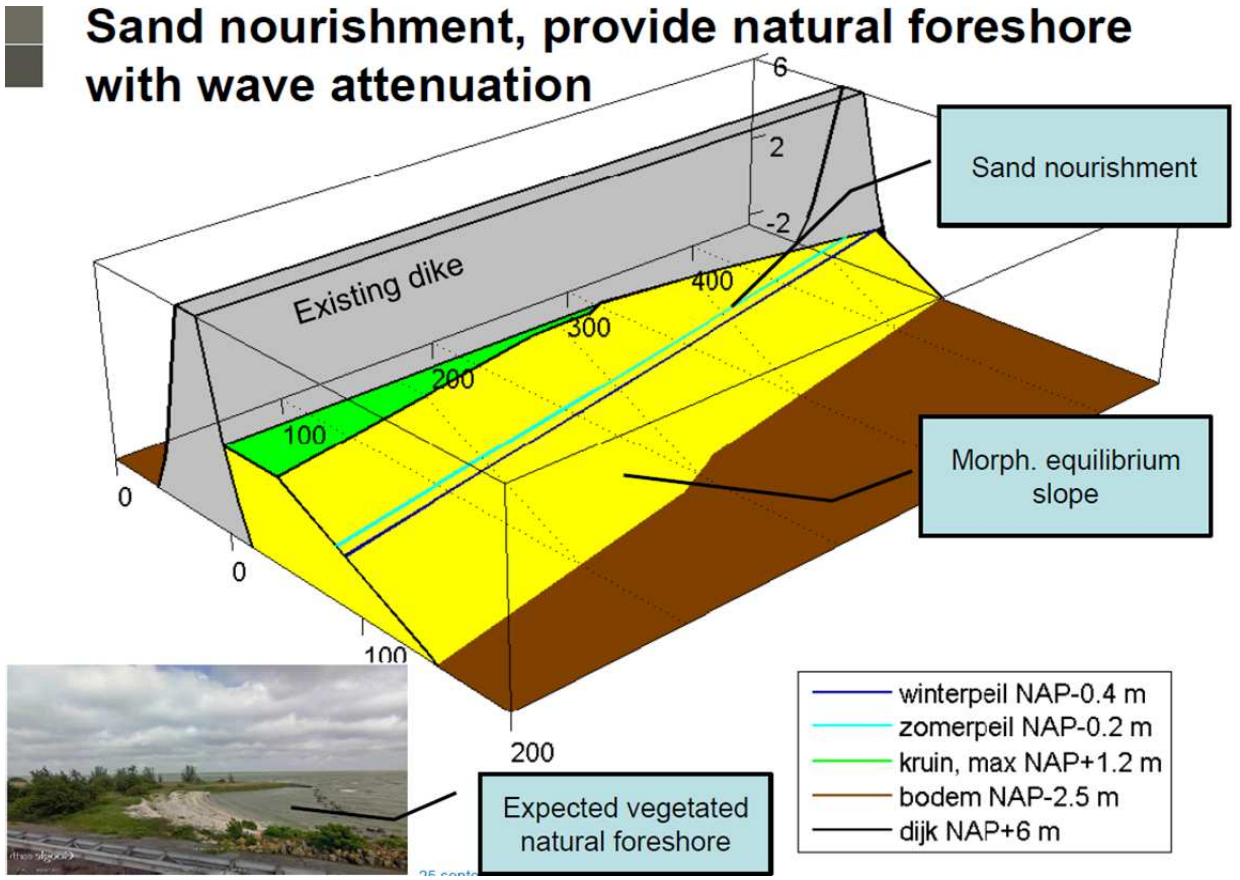






5. Houtribdijk

5. Houtribdijk



5. Houtribdijk : work in progress (aug 2014)

6. Conclusions

- The main threats for the Dutch watersystem are adressed in the strategic Deltaprogramme.
- Every year a programme of measures (projects) is executed (1 billion Euro/year).
- Use of forces of nature (Building with Nature) is applied when (economic) possible.
- Win-win-solutions with positive economical, societal and ecological impacts are possible!
- The ES approach is compatible to BWN and is used to illustrate the win-win of an individual project.