



Deltacommissaris

Water, flood protection and spatial planning, experiences and examples from the Netherlands

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September 2013



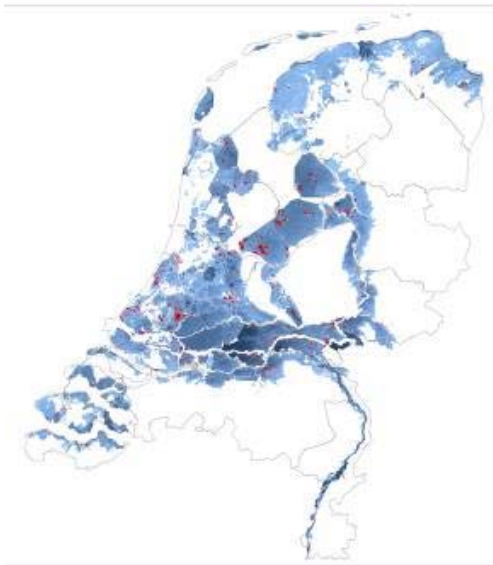
The Dutch Delta in NW Europe



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The Netherlands, 60% flood prone

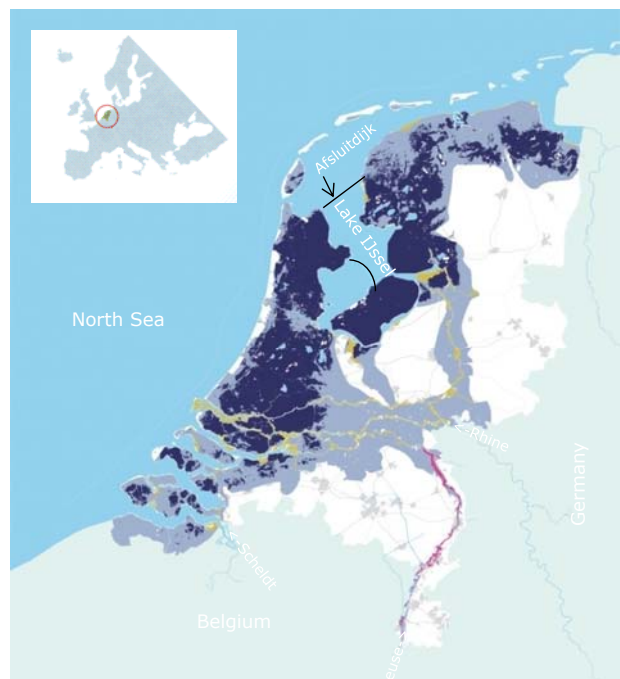


- About 400 km of Rhine river
- International catchment
- About 350 km coastline
- About 9 million inhabitants below flood level
- Invested value 1800 10⁹ euro
- Protection level: 1:10.000 – 1:1250
- 3500 km of flood defences, hundreds of locks, sluices, pumping stations



The Dutch Delta

- Dedicated governance structure
 - Strong administrative bodies
 - Central: ministries/ Rijkswaterstaat
 - Regional: water boards, municipalities, provinces
 - Legal obligation to protect against floods (Water Act)





Zuiderzee → Lake IJssel + polders: 1920 -1970



Dikes: 300 → 45 km
Polder area: +1650 km²
Estimate: 1 FY budget
Real: 2 billion €

Fresh water reservoir
New land for agriculture
Inhabitants: 500.000



Deltaworks: 1958 - 1998



Dikes: 750 → 50 km
Estimate: 0.8 bln €
Real: 5 bln €
Freshwater supply
New access roads



The 1993 – 1995 high river discharge

- 1993/1995 high water levels in several rivers
- Resulting large evacuations
- Spatial solutions:
Room for the River /
Meuse Projects



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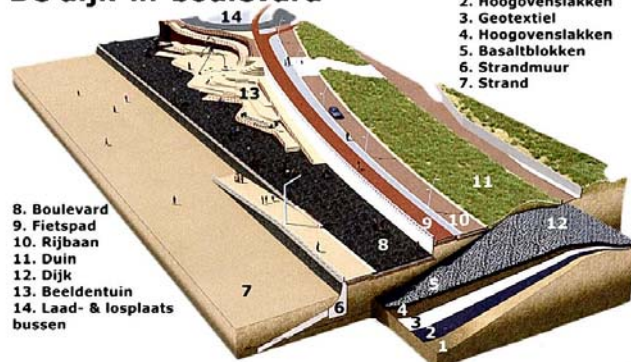
Delta Programme
6 October 2011
Commissie



Sea level rise → 10 weak coastal spots (< 2020)



De dijk-in-boulevard



Scheveningen Boulevard
Length: 2 km
Height: 8.5 – 12 m + msl
Volume: 2.6 mln m³
Estimate: 75 mln €

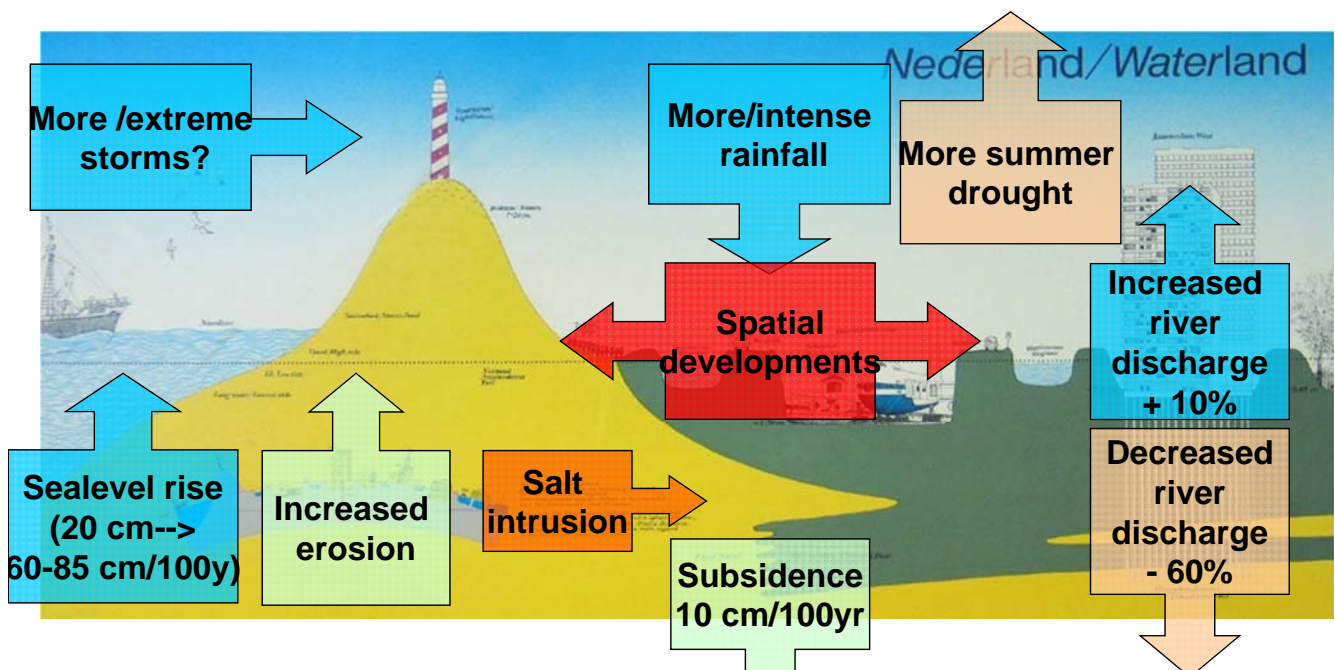


Lessons learned up till now

- Integrated plans → added value
- Overall regional vision → framework for local tailormade solutions
- Start small, learn by doing
- No blue print, adapt in time

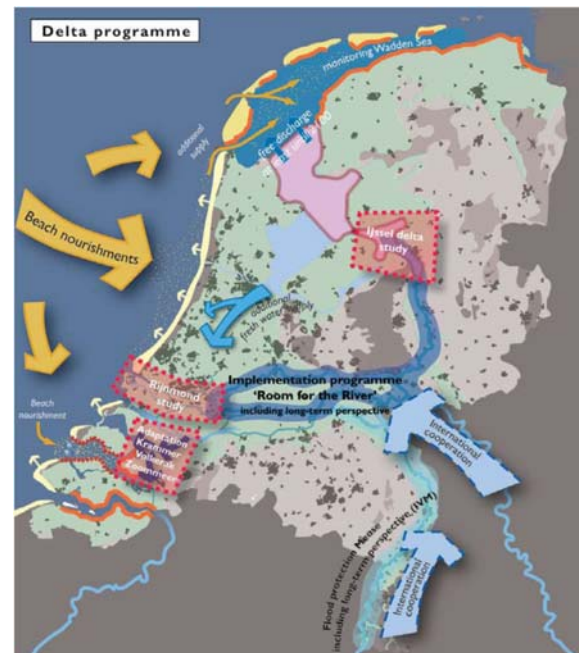


Preparing for the future: climate change...



Delta Commission, 2008:

*The threat is not acute,
but measures to improve
flood risk management and
fresh water supply
should be prepared urgently!*



An innovative approach: Delta Programme

- DP is aimed at keeping NL a good, safe and attractive place to live and work
- Two goals, three values
 - Safe now and in the future [2050-2100]
 - Fresh water supply guaranteed also in dry periods
 - Solidarity, flexibility, sustainability
- For the people and the economy
- Not in answer to a disaster, but in advance, to be prepared and avoid it
- Annual update to parliament





Vision Delta Commission (2008), as a framework for decisions

- We stay in the (floodprone) part of the Netherlands,
- Safety against flooding to be based on risk management, including fatalities, economic damage and disruption;
- Solidarity among inhabitants and generations
- Work together with natural processes ("building with nature"), watersystem approach
- Flexible strategy ("No regret", framework, no blueprint) to deal with uncertain future ("adaptive delta management")
- Multifunctional design of measures → added value for society



Prerequisites for future-proof implementation

- Delta Program: measures, yearly update, presented to Parliament)
- Delta Decisions (strategic, 2015)
- Delta Commissioner,
supervising adequate (regional) multi-governmental implementation
- Delta Fund, 4500 Me until 2020, > 2020: 1000 Me / yr
- Delta Act, "anchoring" Delta-commissioner, program and fund

Ensuring continuity

- Delta Act: legal base for the Delta Programme
 - Delta Fund to guarantee long term financial stability (€1 billion/year)
 - Government Commissioner for the Delta Programme



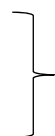
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Delta Programme
Commissioner

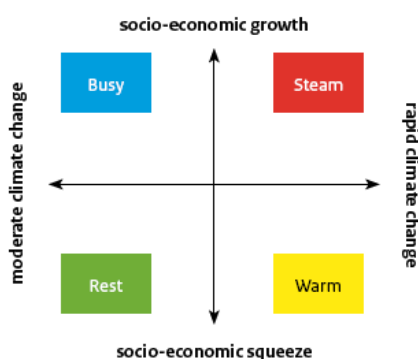
Uncertain future

- Monitoring changes
- Increasing knowledge



In the meantime:

- Strategy development
- 4 Delta Scenario's
 - Climate change
 - sea level rise, river discharge, precipitation
 - Socio-economic developments
 - Population, economy, land use/urban development, fresh water demand





From scenario's to strategies

- Scenario's show us 'tipping points':
 - Maeslant barrier
 - Afsluitdijk / lake IJssel
 - Fresh water inlets
- Adaptive delta management
- Check robustness of strategies



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Delta Programme
Commissioner



5 key decisions, 2014-15

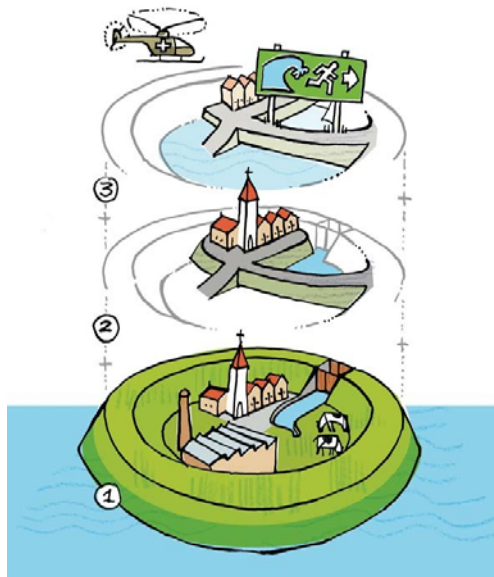
- Safety standards and program
- Spatial adaptation
- Freshwater strategy
- Meuse-Rhine Estuary
- Lake IJssel



Delta Programme Commissioner

6 October 2011

Flood Risk Management policy (EU, 2007)



3 layered approach:

Preparedness

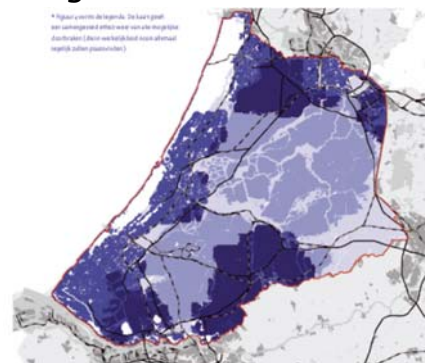
Land use planning
(new developments,
vital infrastructure)

Protection

Recent developments in flood protection



- delta-dikes ("superlevees"),
- multifunctional dikes,
- new techniques, sensors
- flood hazard map:
 - depth, time of arrival)
- "building with nature"



Building with Nature



Delta atelier workshops

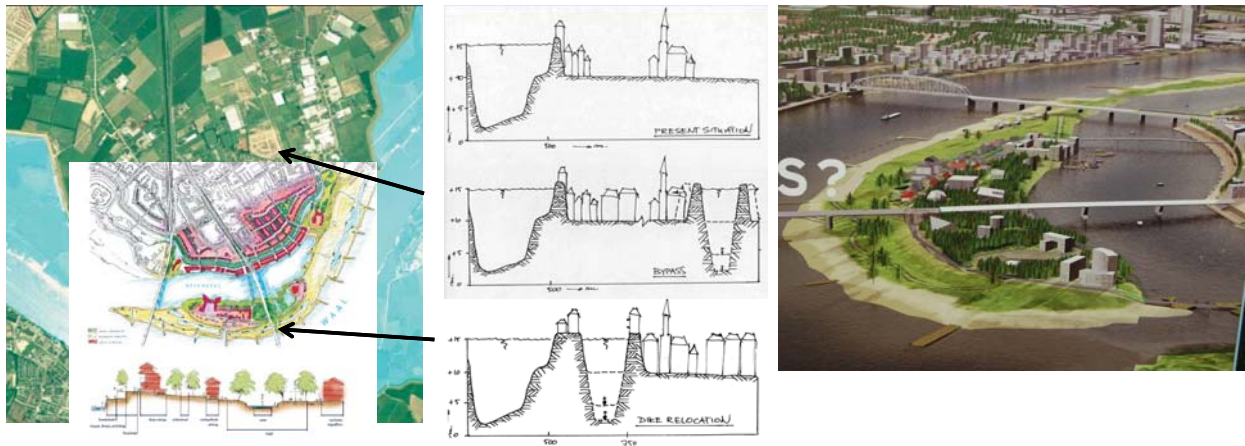


To connect interactively:

- Land use planners - (technical) experts ("knowledge and design")
- Hydraulic objectives - local initiatives
- Costs - benefits
- Abstract ideas - images/maps
- Project - public



Dike relocation Nijmegen

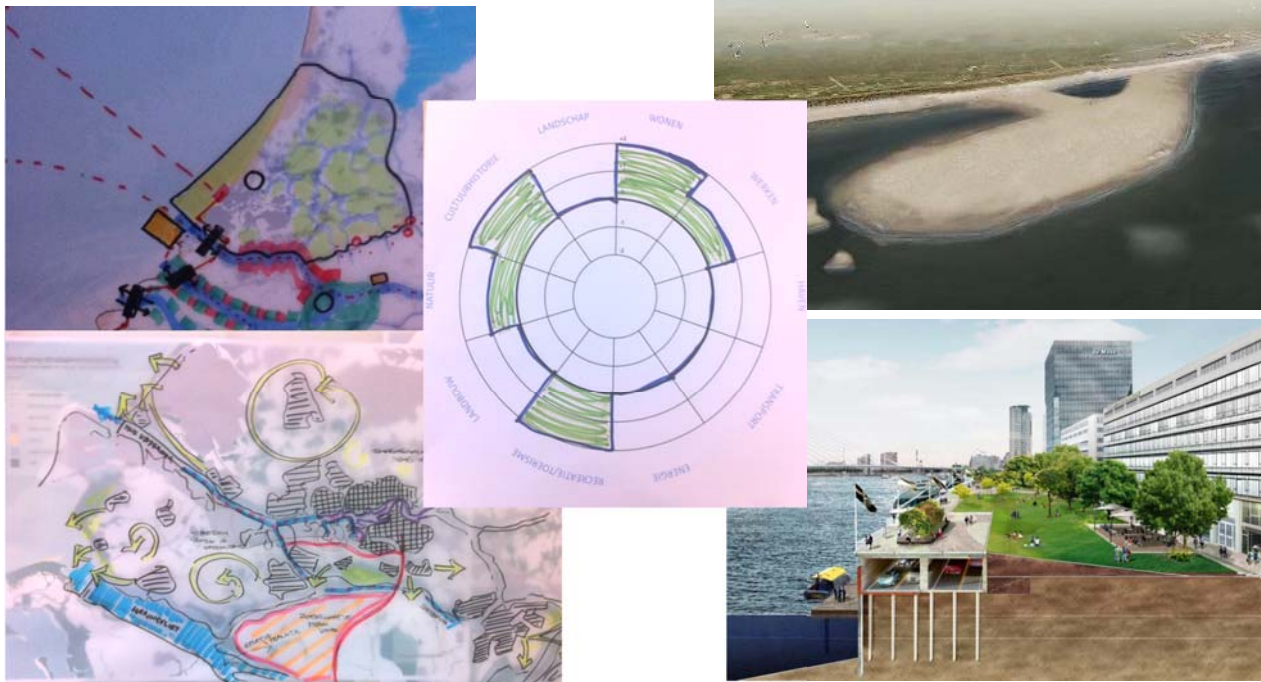


Room for the river: Noordwaard Project





Rotterdam – Rhine estuary



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Petten, North Sea coast



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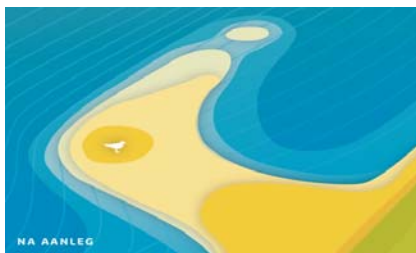
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After 2015: Delta Works of the Future

Possibilities for innovative solutions

- Building safety using nature
- Technology / sensors integrated in dike body
- Separating fresh and salt water ('bubble-screen')
- The sand engine



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“Working together with water”

www.deltacommissie.com



“Working on the Delta”

www.deltacommissaris.nl

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