Ministry of Foreign Affairs of the Netherlands

Adaptation and Resilience Projects in The Netherlands

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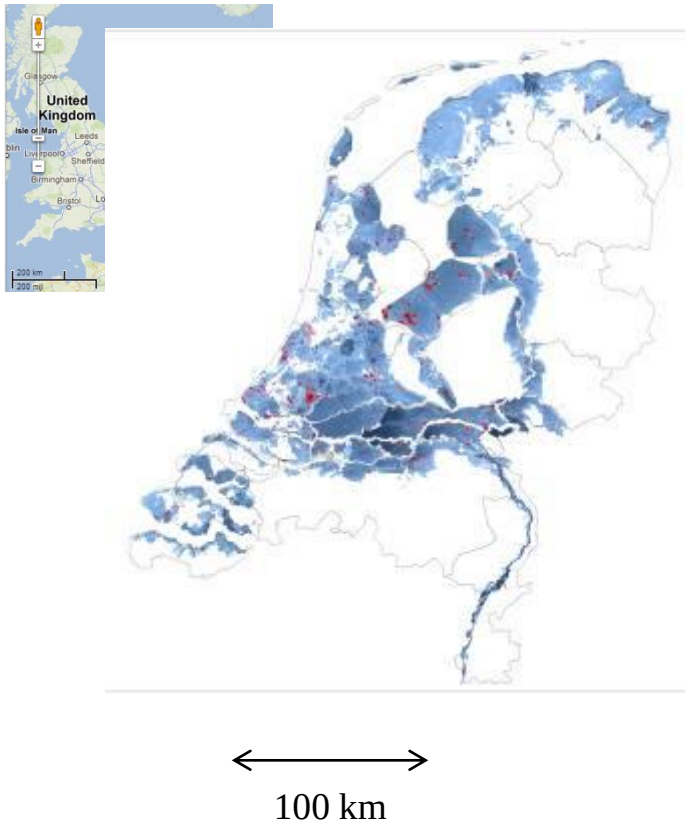
The Netherlands, The risk is real, 24-7



- 400 miles of rivers draining Europe
- 60% of land at/below sea level
- 17 million people, 9 million of which live below flood level
- GDP 600 bln euro (70% produced at/below sea-level)
- 2100 miles of flood defences, hundreds of locks, sluices, pumping stations
- storm surge, wet weather, river discharge, subsiding, changing climate. SLR: 1 – 2.5 ft ~2100

- The Paradigm:
  - water mgmt = *national* survival
  - climate adaptation is *opportunity* to improve places while upgrading flood safety

1990s/2000s: evolution from Flood Prevention to Flood Accomodation, and to multi-layer flood safety

- Prevention

  Limit the risk of a flood disaster

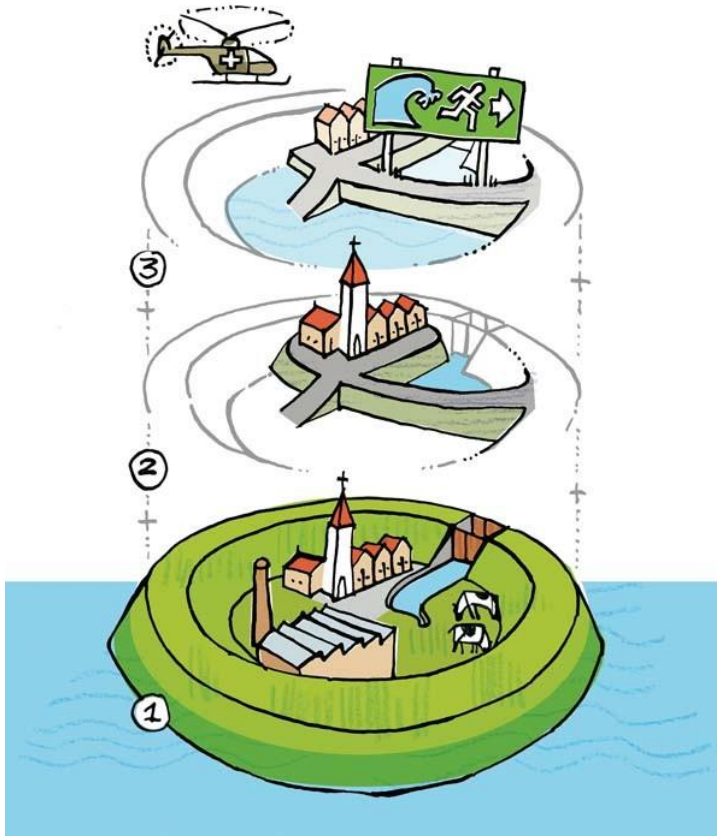
  (dikes, dunes and barriers)

- Sustainable spatial planning

  Limiting flood effects, making communities and infra more valuable and resilient

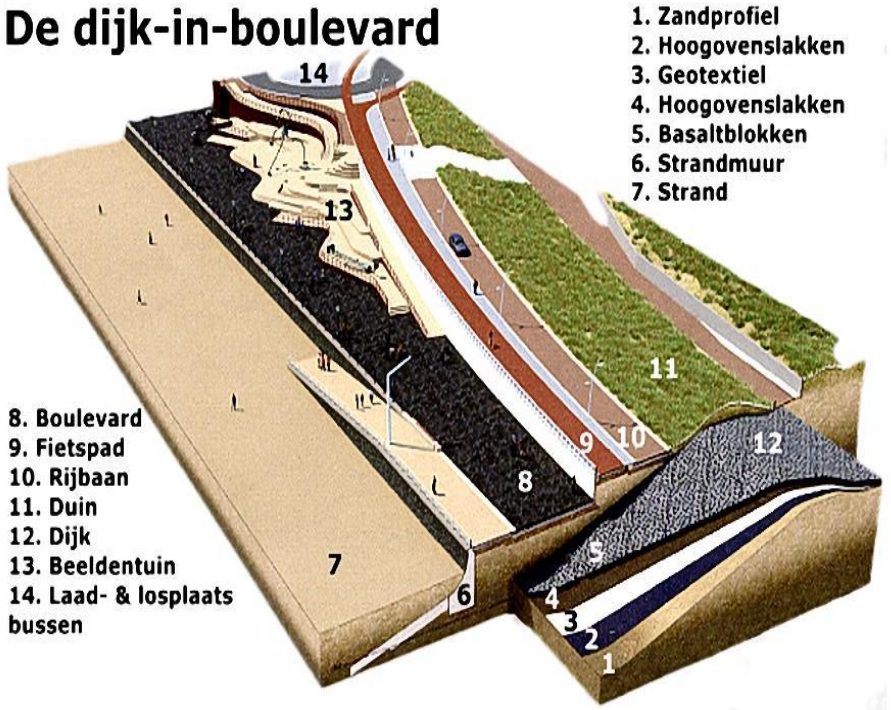
- Crisis management

  Reducing the consequences of a flood



Scheveningen Boulevard (7km / 4m)

Mandate: raise protection to standard (1/10000), 2006 “weak link”
16 million visitors/yr
don’t disrupt, but improve, commerce / use
enhance urban amenity / public space




MUSEUM BEELDEN AAN ZEE

Katwijk

Protection

dike in dune

higher dune

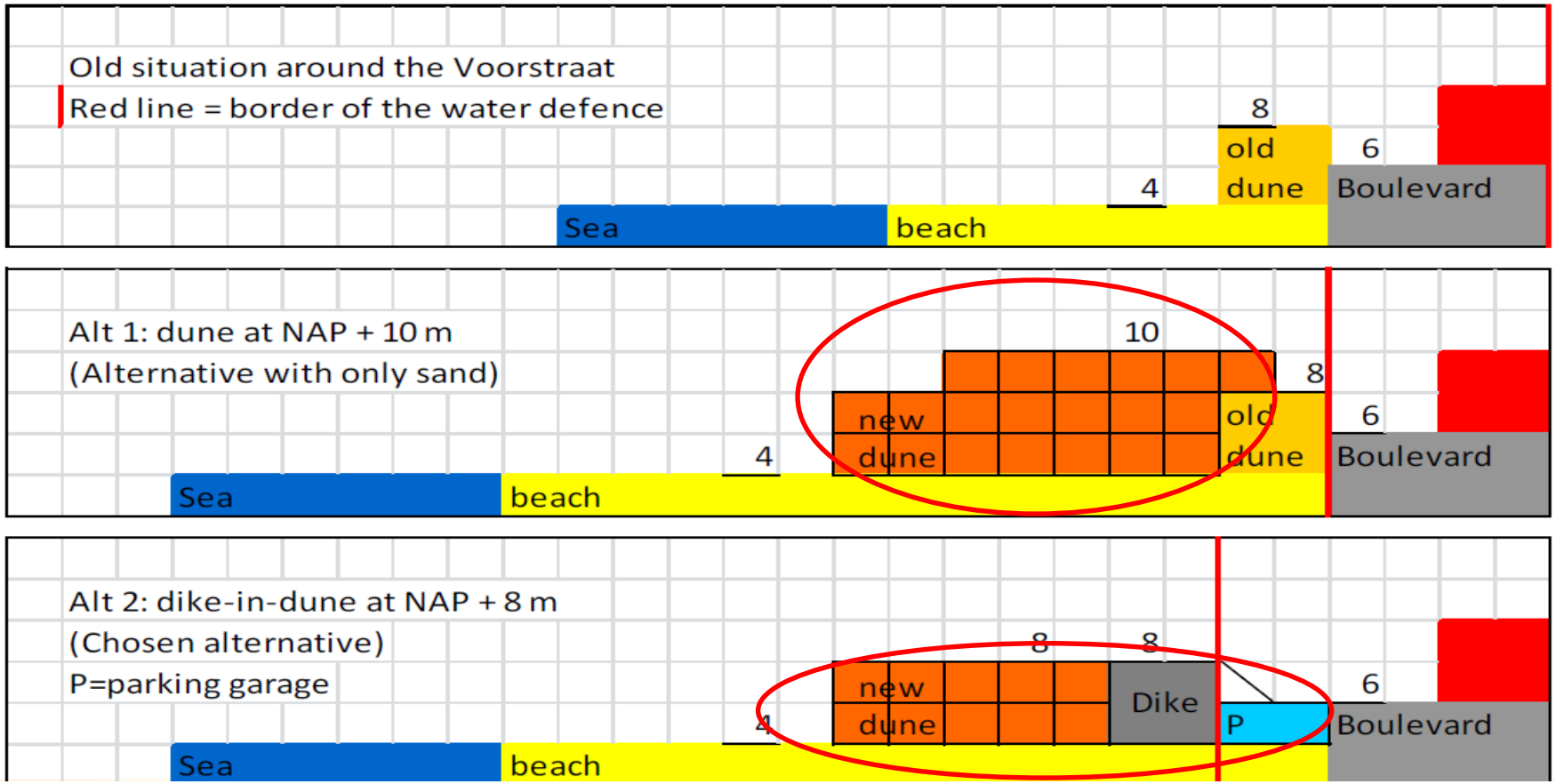
wider beach front

Spatial Enhancements

- Recreation (wider beach)
- Improved Boulevard for expanded retail
- Parking (PPP)
- Economic Impulse

- Cost: 78 mln euro

Original situation, Dunes solution or Dyke in Dunes and parking

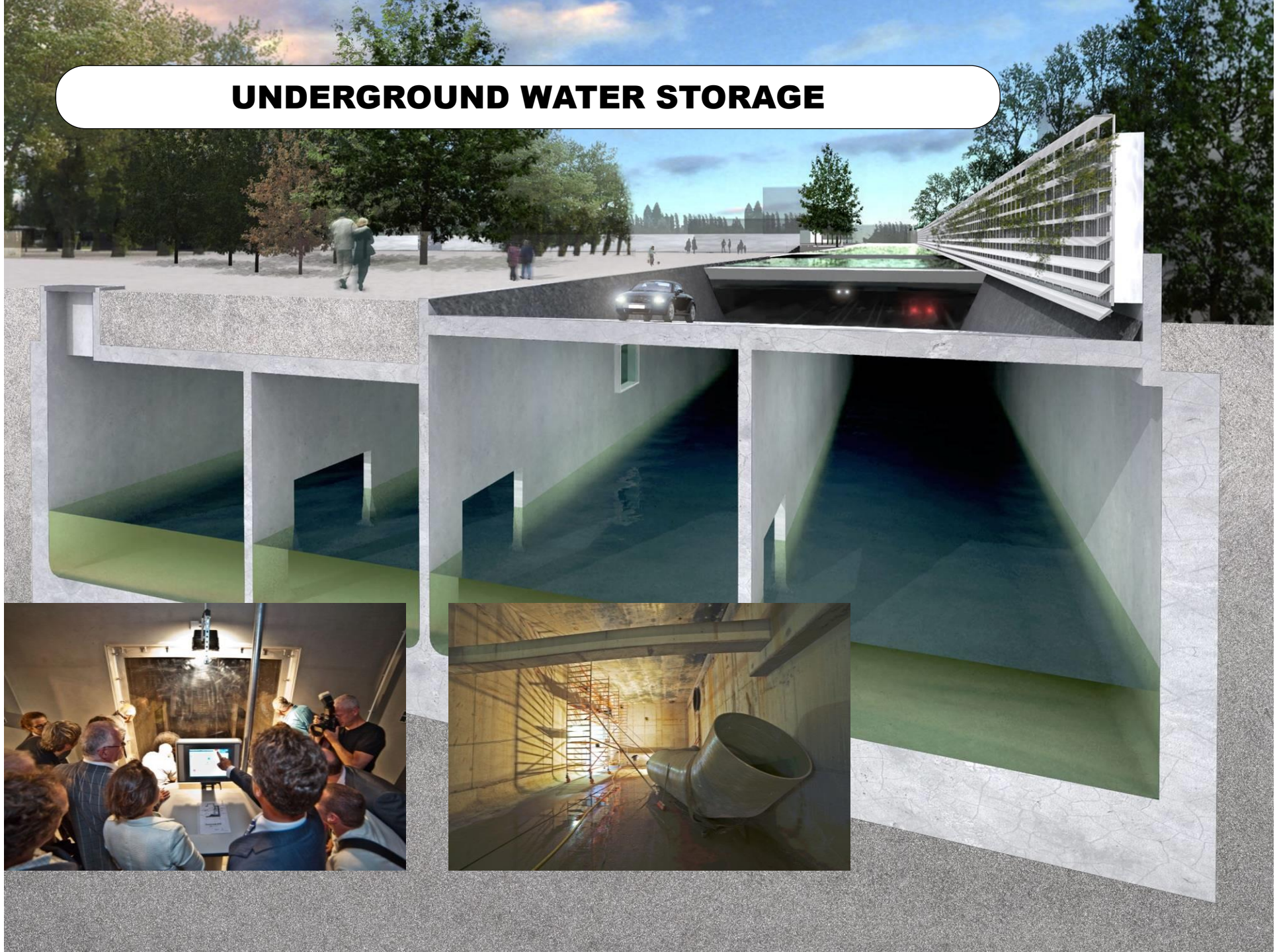


Original – Dune solution – Dyke in Dune

660 hidden beachfront parking spaces

URBAN FLOODPLAIN

UNDERGROUND WATER STORAGE

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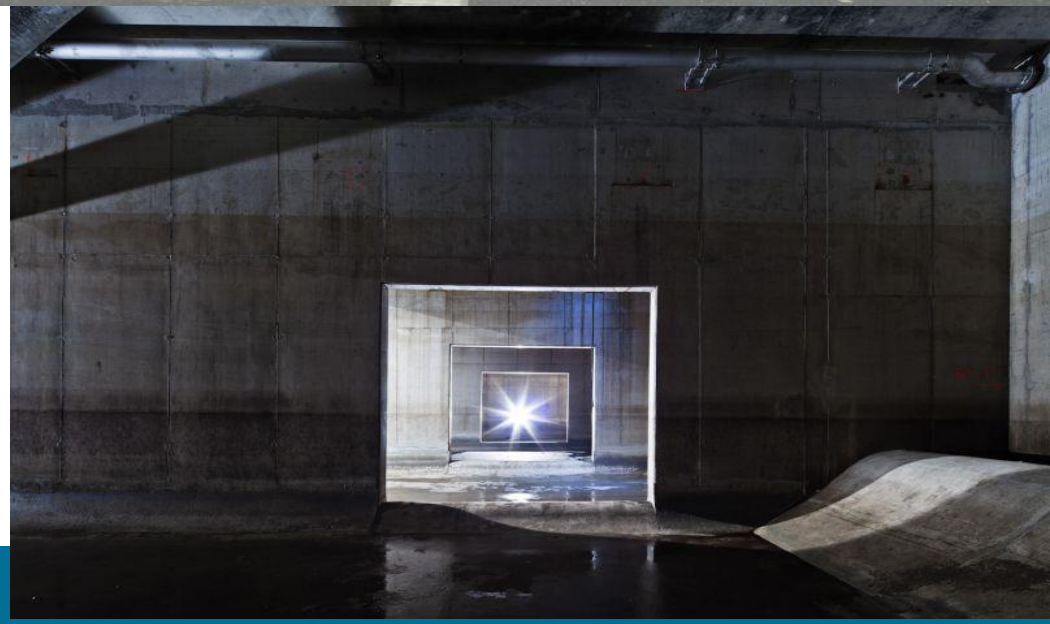

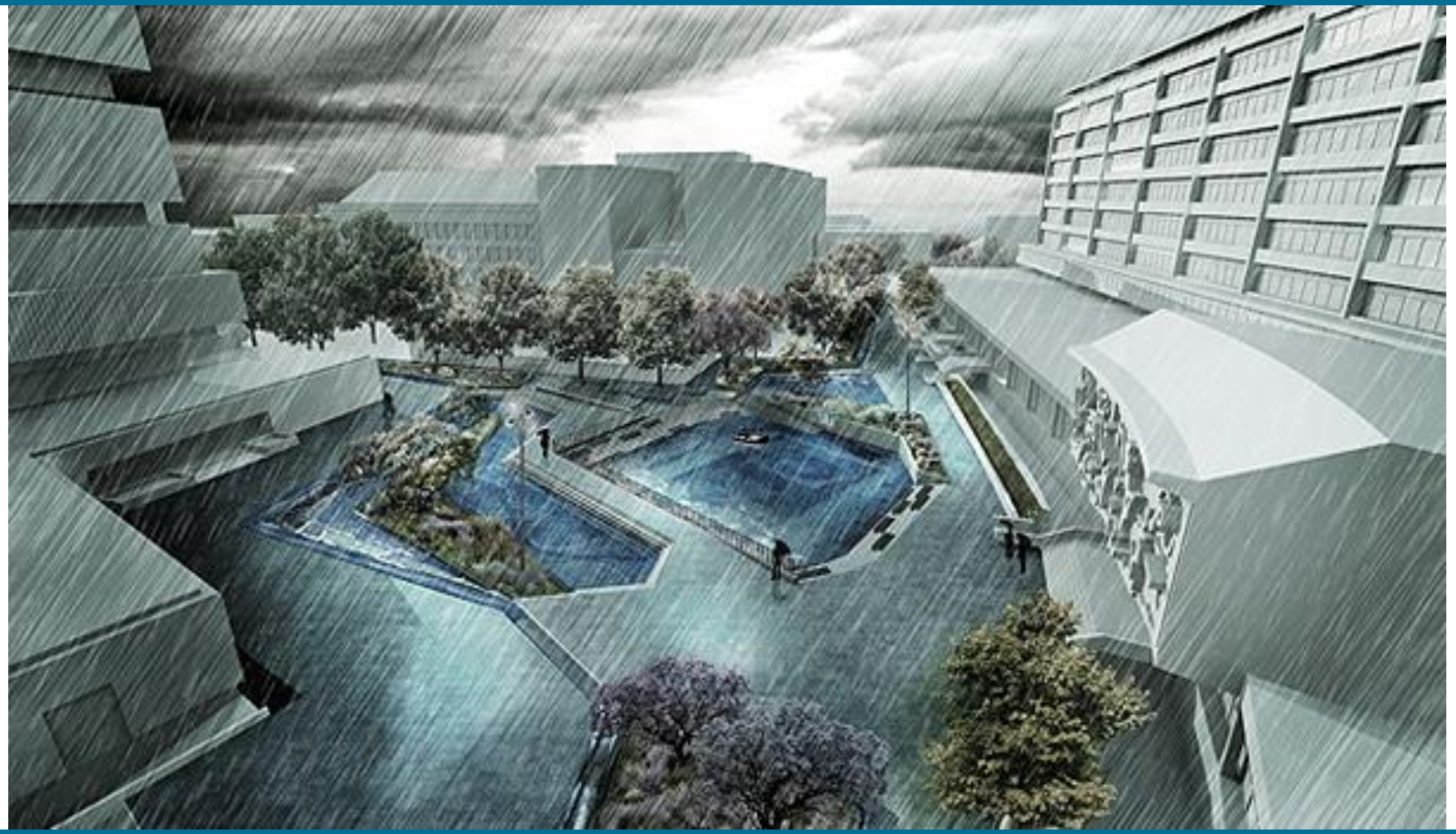


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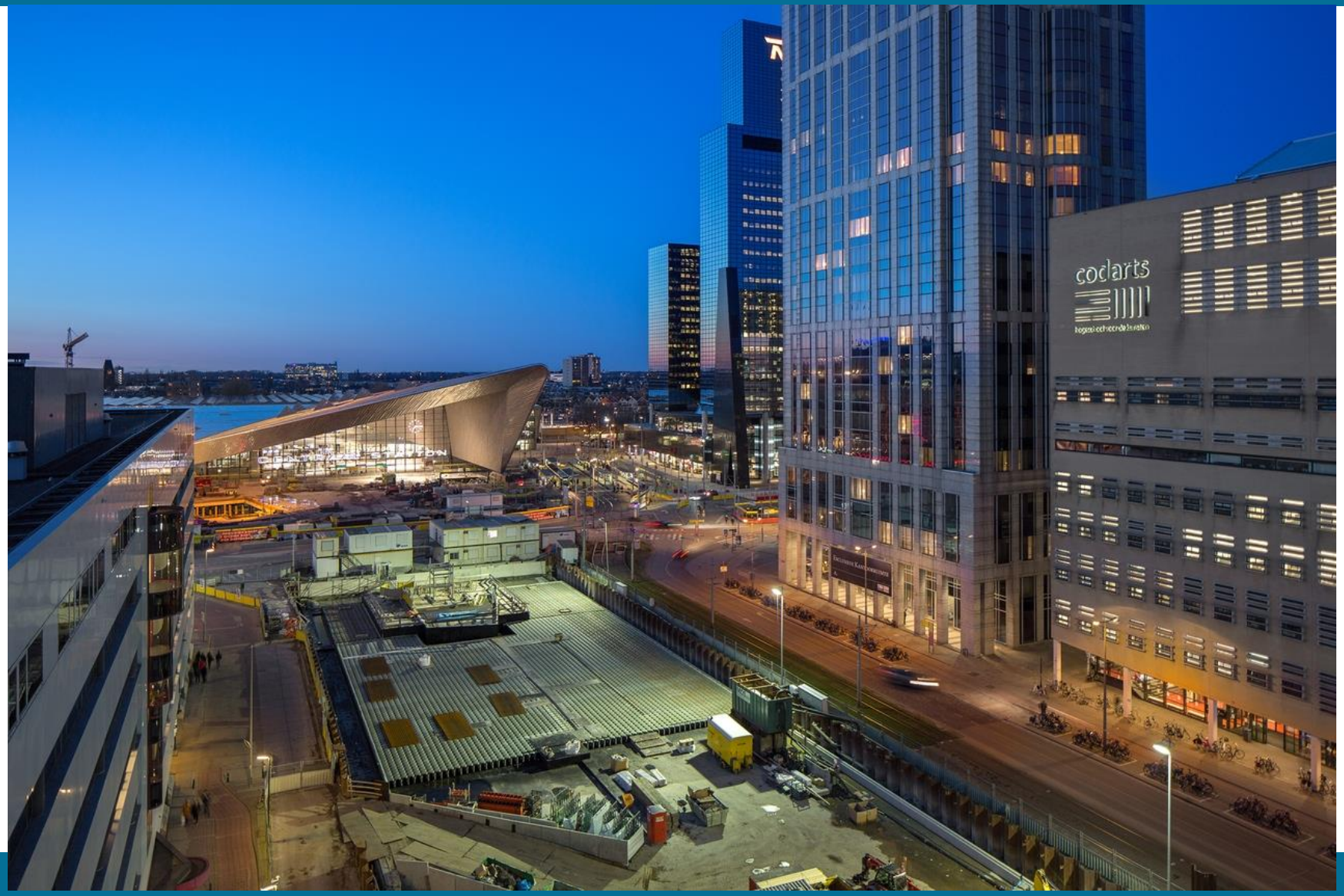
photo Millad Pallesh


codarts

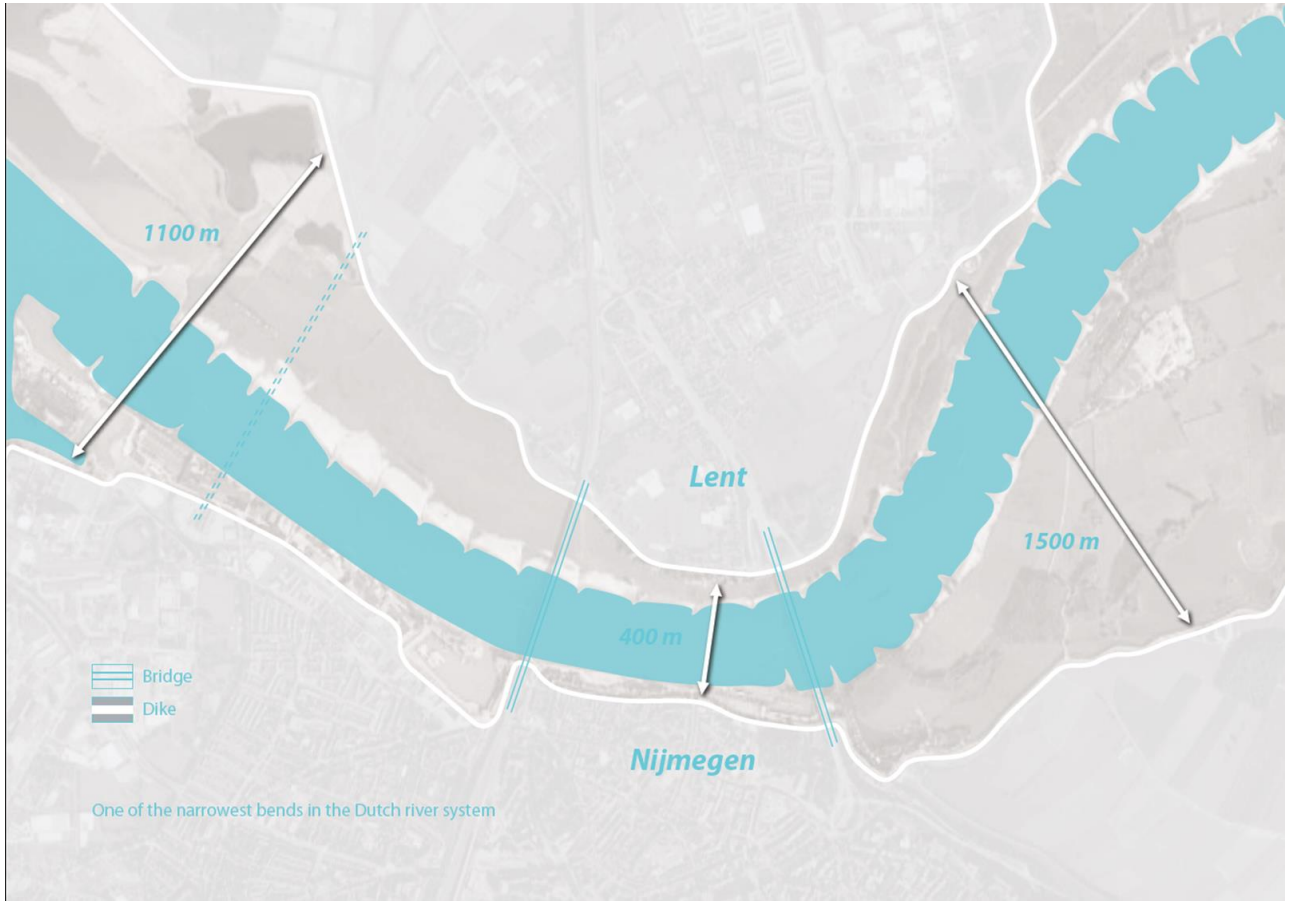
1993 / 1995: 1/300 yr flood levels

35 Room for the River projects ($3 billion)

Two <u>equal</u> goals:

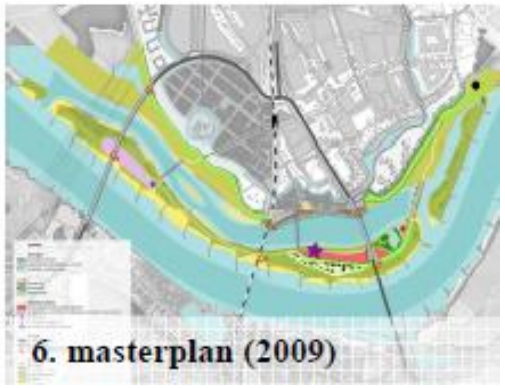
- Flood risk reduction – discharge and storage
- Improve spatial quality

Nijmegen floodplain bottleneck



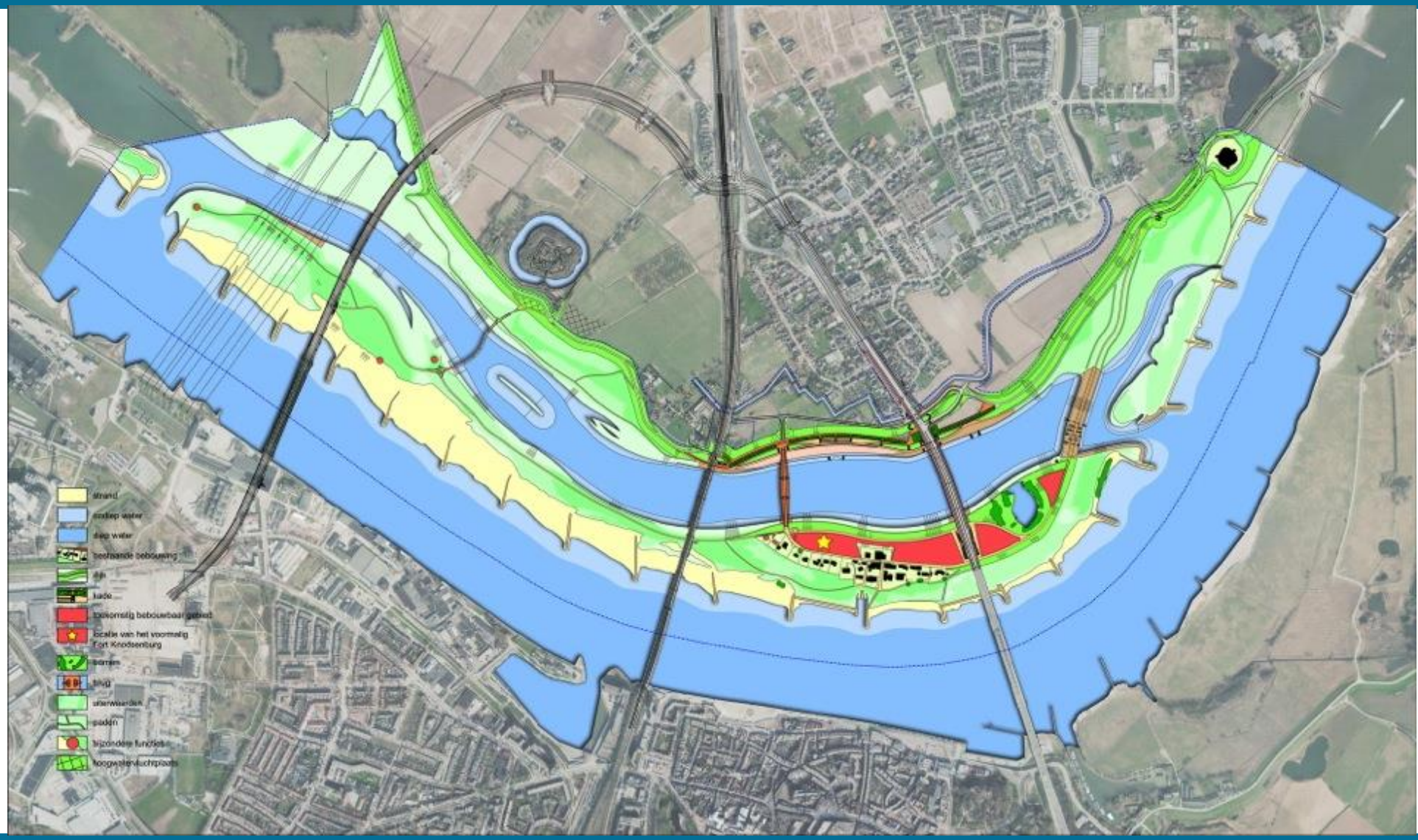
2000: “bad” options

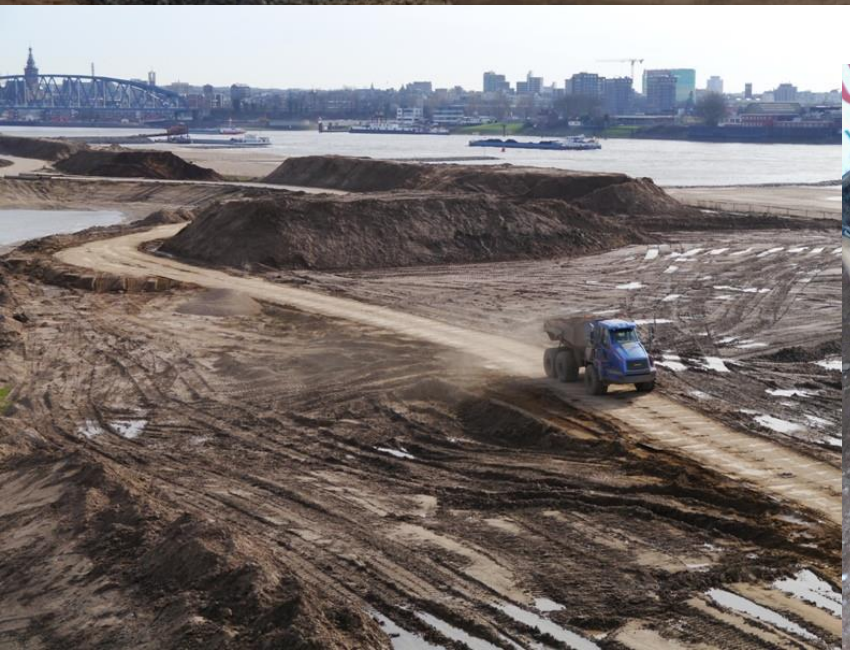
Dike set-back: safety, increased storage / flow, new development opportunities (400m euro)



- €365 ($ 475)
- 50 households displaced
- 2,5 km side channel
- 3 new bridges

  NS Rail improvement
- 7 public authorities
- Waterfront housing
- Waterfront retail



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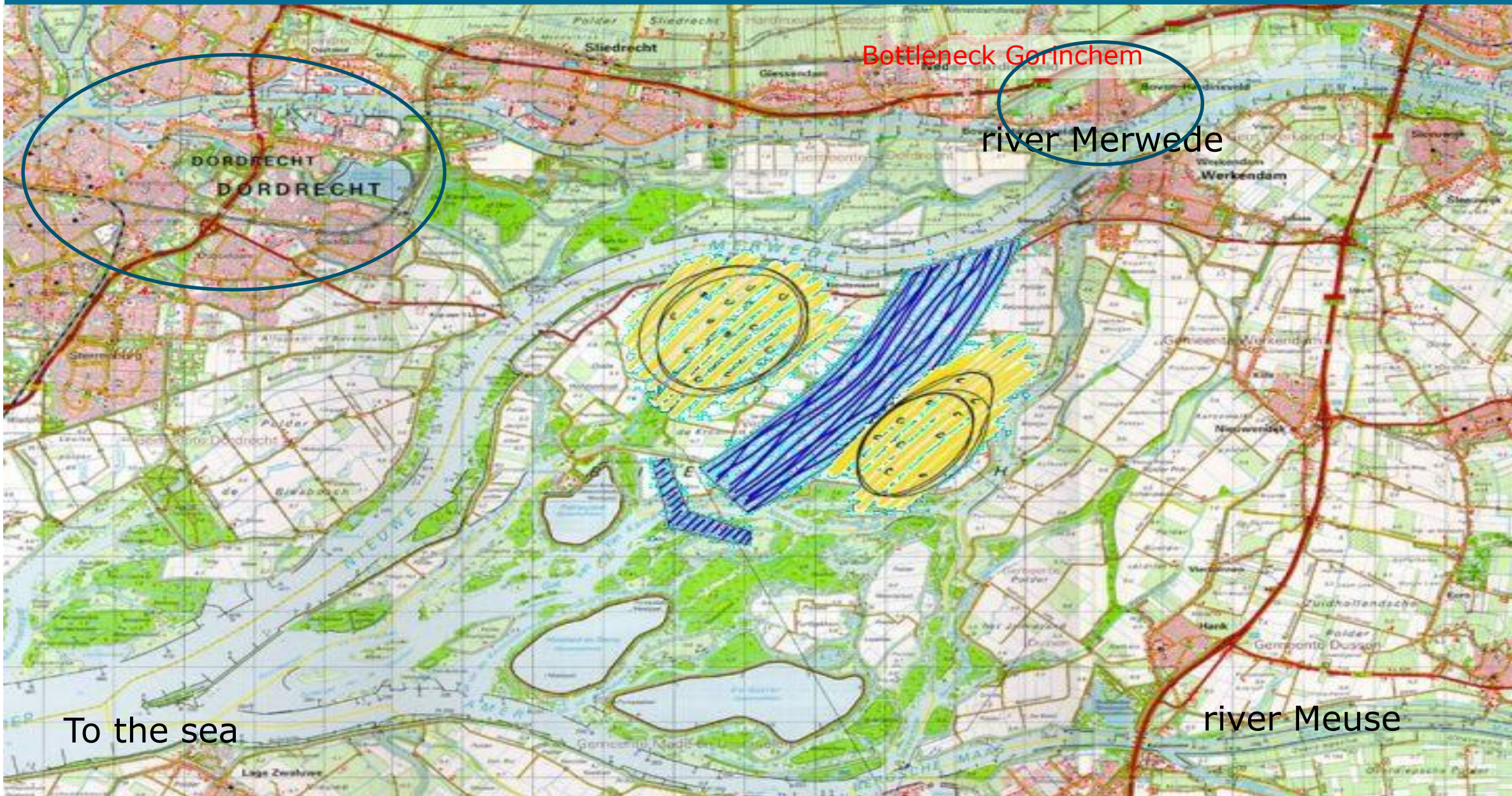
Johan Roerink /


Johan Roerink / Aeropicture.nl

3 Depoldering, the plan




Gemeente Dordrecht
Dordrecht
Werkendam
NIEUWE MERWEDE
Zuilespolder
Otterpolder
Middelste Kievitswaard
Kievitswaard
Muggenwaard
Werkendam
Kaszersguldenwaard
Steenenmuur
Petruspolder
Noorderplaat
B
O
S
C
H


Martens en Van Oord

The Eco Dike: Willows as Flood Sentinels

Ecosytem Services Valuation (Earth Economics)

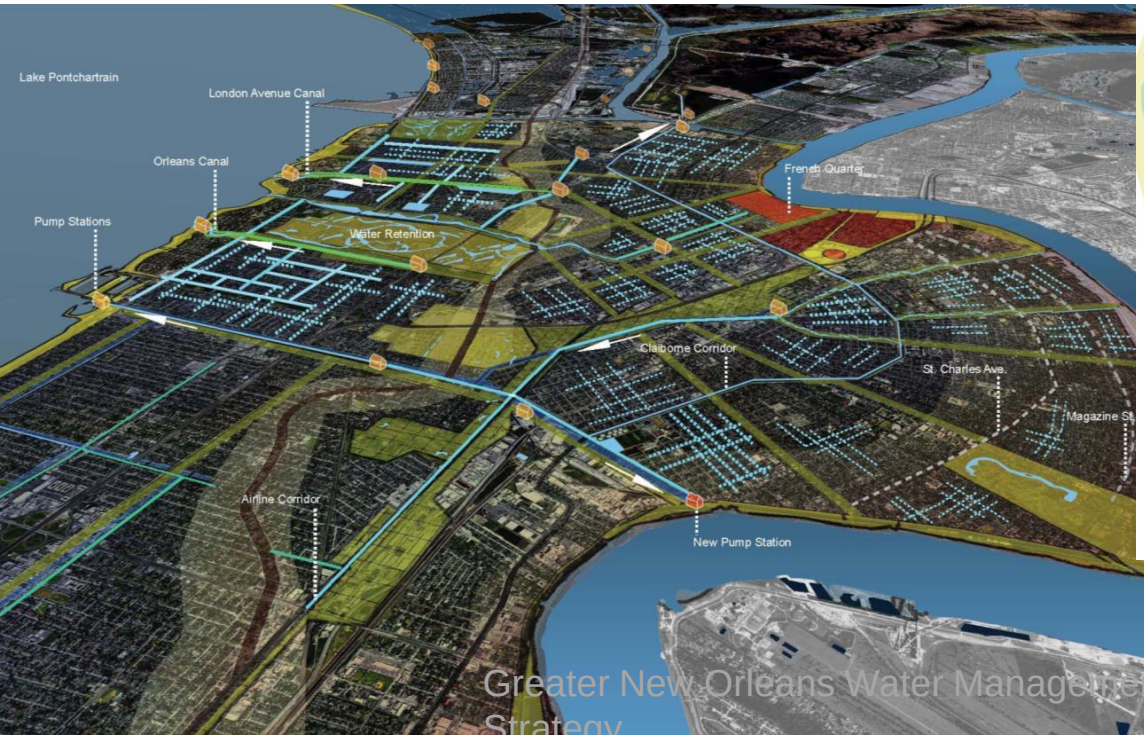
Provisioning services:
produce food, water, oxygen, buildings, fuel, clothing, medicine, etc. Everything in our economy is made from natural capital such as minerals, liquids, gases and living things.

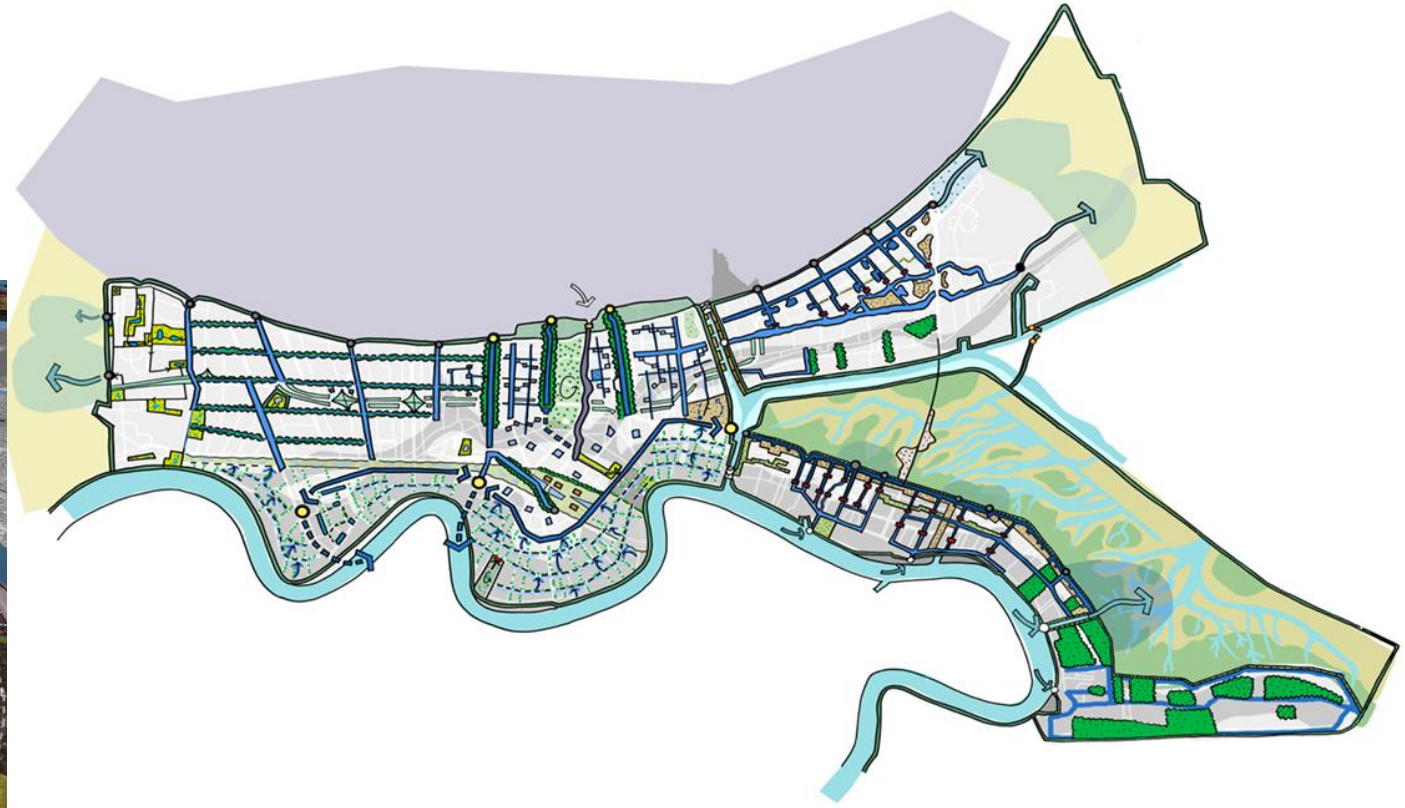
Regulating services
create and maintain healthy environmental conditions. Examples are gas, and climate stability, flood and storm protection, water quality, soil erosion control, and disease and pest control. These contribute to ecosystem functions and economic resilience.

Supporting services
maintain conditions for life including habitat, nutrient cycling, soil formation, and pollination. These natural processes are vital. Provided to us free of charge, they are often left out of economic analysis.

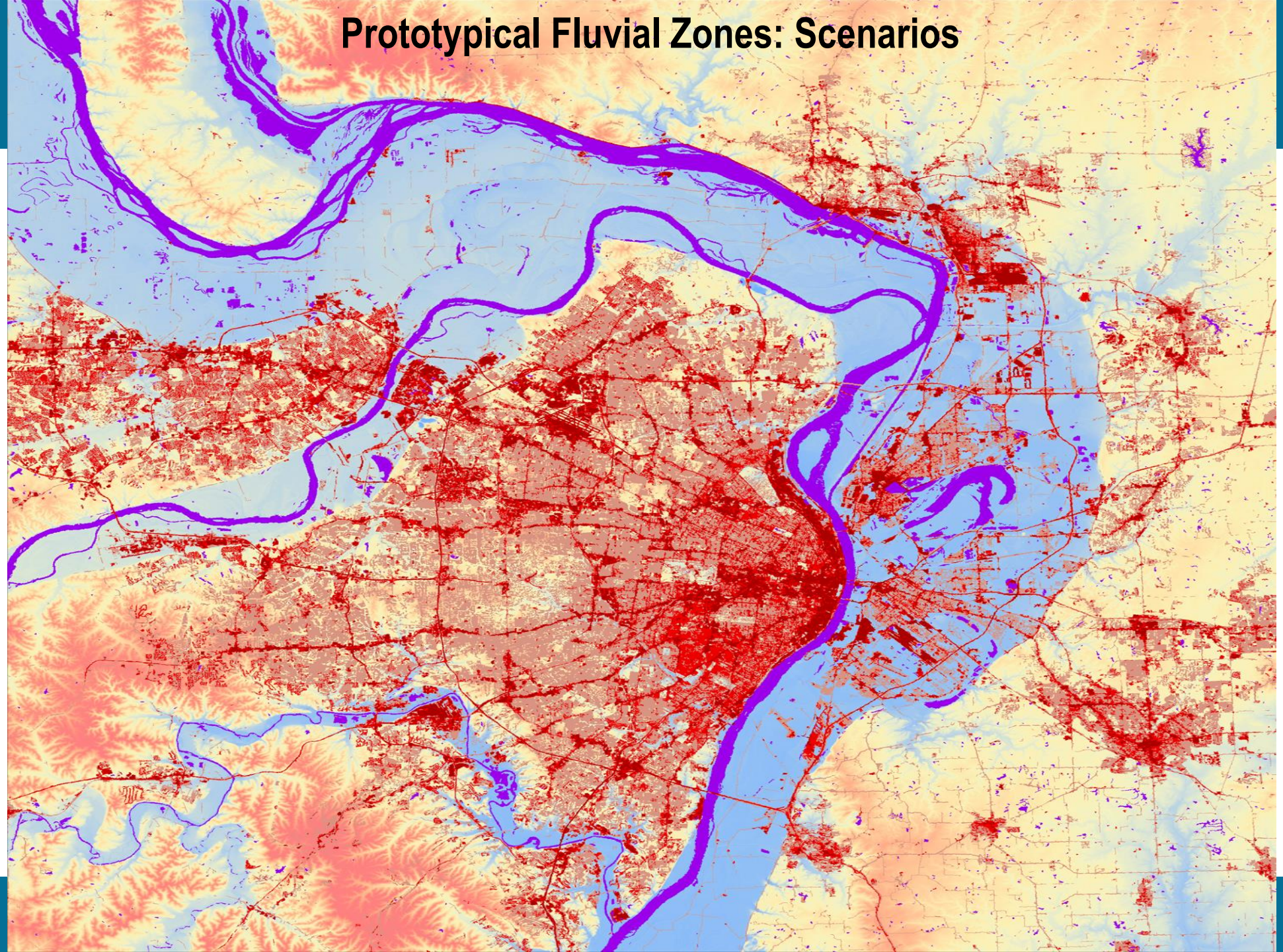
Cultural services
provide meaningful human interactions with ecosystems. Cultural services include spiritual, recreational, scientific, aesthetic and educational value.

From Dutch Dialogues to Greater New Orleans Urban Water Mgmt Strategy

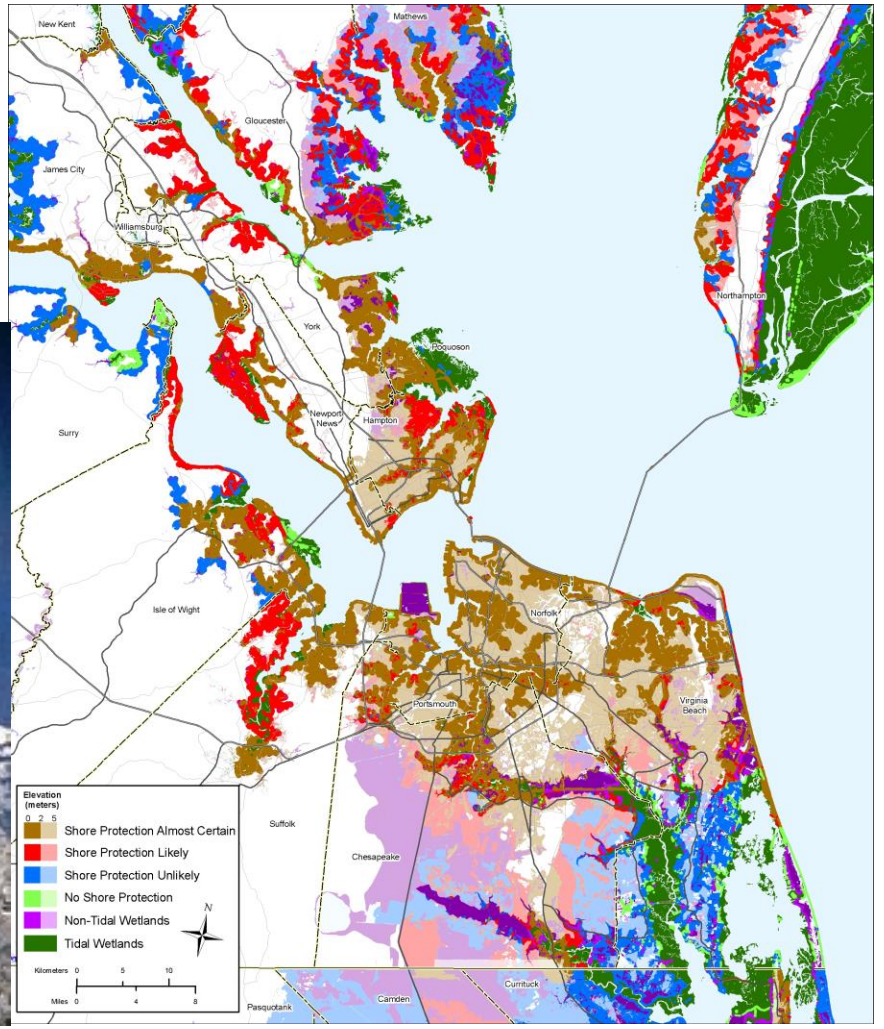




Prototypical Fluvial Zones: Scenarios



Miami 2013/2014
Los Angeles: 2013/2015
Hampton Roads, June 2015



Thanks!

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Waterandthedutch.com

Livingwithwater.com