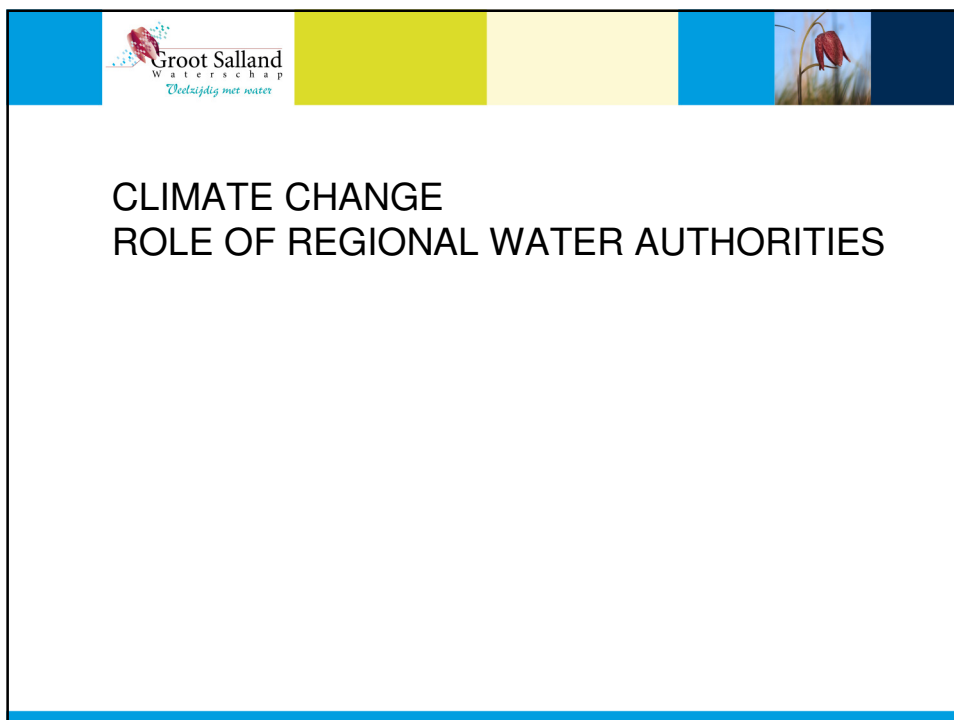



FRESH WATER AVAILABILITY

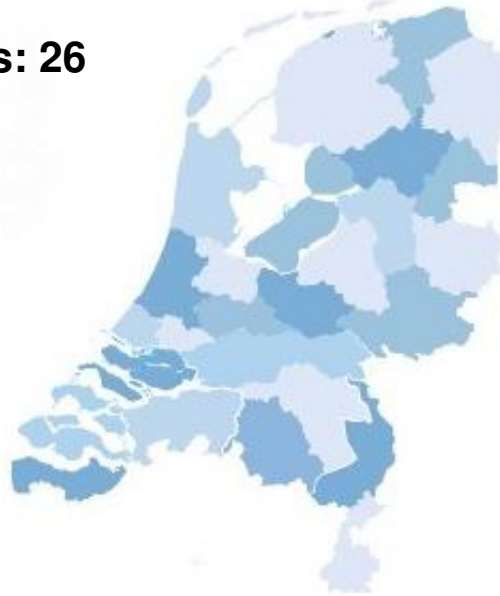
Prof. dr. Sybe Schaap
Water governance, TU Delft



CLIMATE CHANGE ROLE OF REGIONAL WATER AUTHORITIES

Water authorities: 26

1953: 2.600



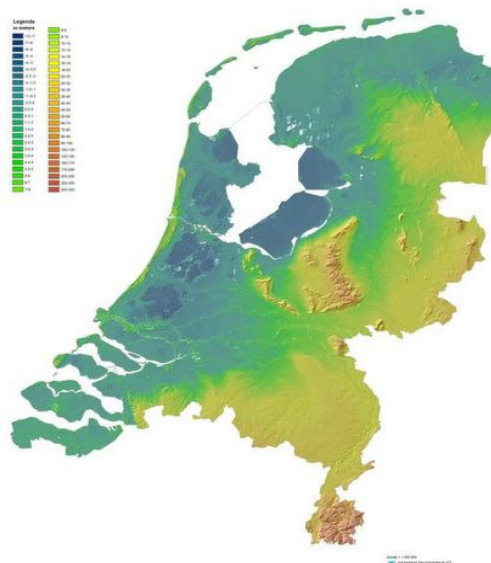
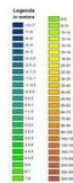
The Netherlands

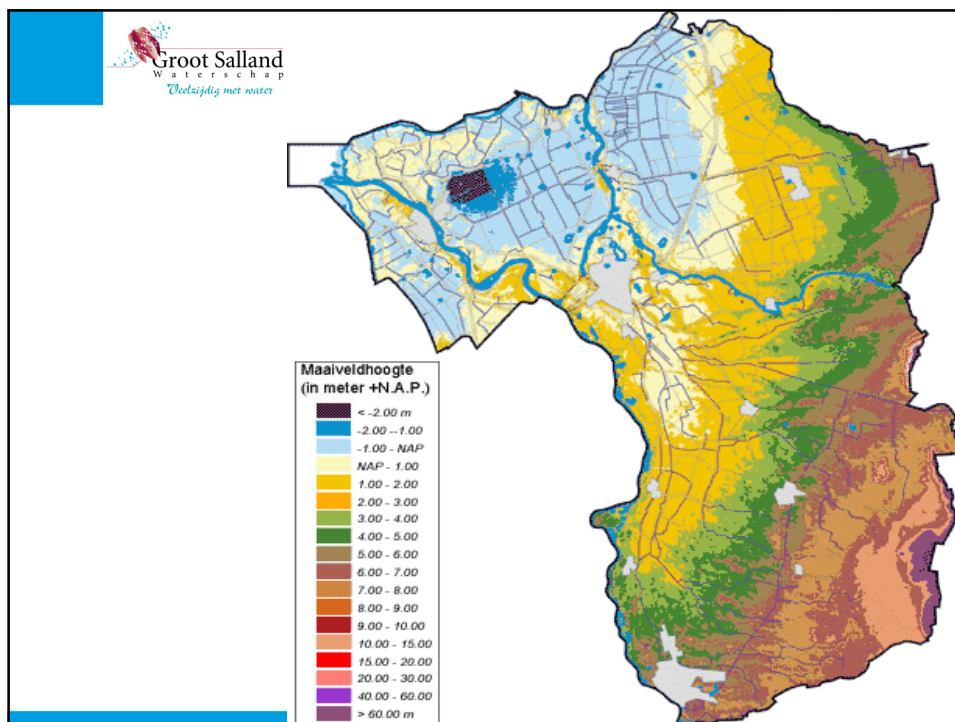
When no
dikes/dunes:

1/3 below sea level

1/3 frequently under
water

Actueel Hoogtebestand Nederland (AHN)
met reliëf-schaduwwerking





HISTORICAL SITUATION

- periods of heavy rainfall / droughts
- water policy: discharge + freshwater supply
- growing risk situation:
 - agriculture / nature / real estate





1998: NATIONAL WATER ACT

- new water system norms
- rural and urban areas

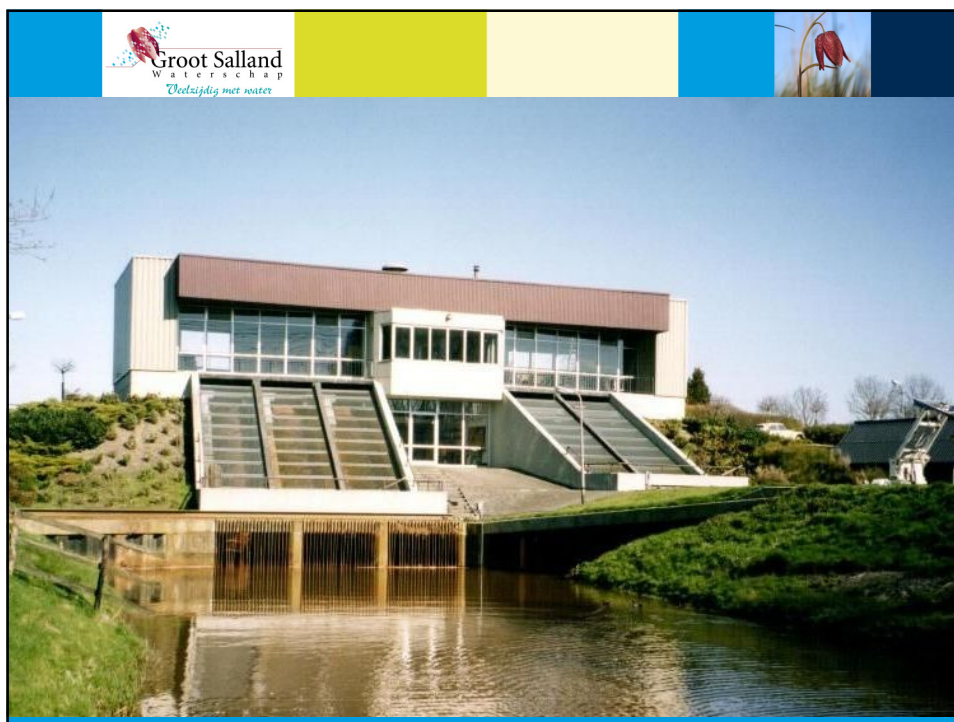
CLIMATE CHANGE

- growing extremes = risk situation
- challenge: avoid risks + rebalance water system
- additional norms?



CLASSICAL RURAL SPATIAL POLICY

- a. primacy agricultural development
- b. water system subservient




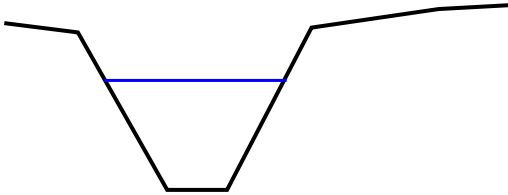






Before

Low cost: small and deep

NEGATIVE CONSEQUENCES

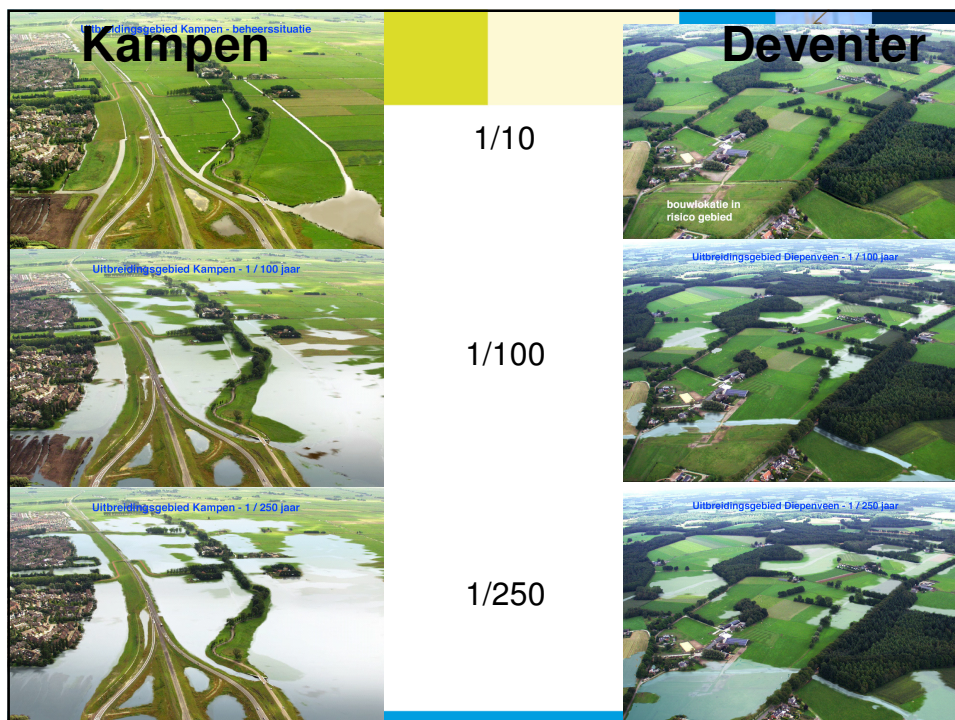
- a. system very expensive
- b. disturbing ecology
- c. not development proof
- d. not climate proof

SINCE 1998

- a. new integrated water system policy
- b. probably climate proof
- c. policy sequence: resilience / storage / discharge
- d. integration abundance / shortage = efficiency
- e. integration water quantity – ecology
- f. result: water framework directive proof
- g. rural and urban areas

URBAN AREAS

- involvement water authorities in spatial planning
- minimal retention measures

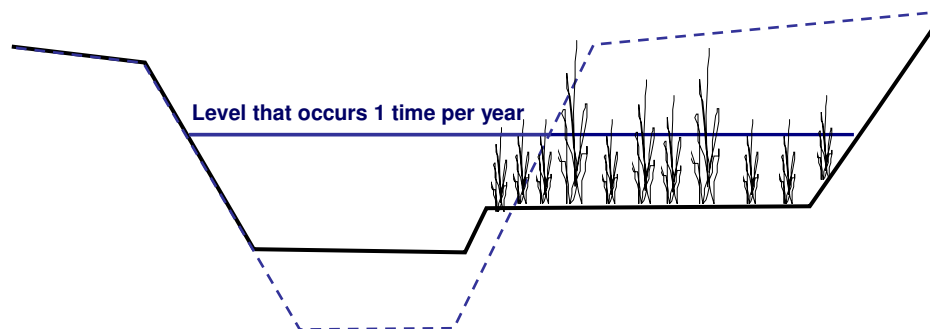


RURAL AREAS

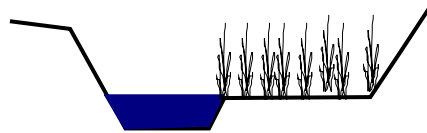
- a. integrate storage and drought supply
- b. restructuring main canal system

Design according Waterlood

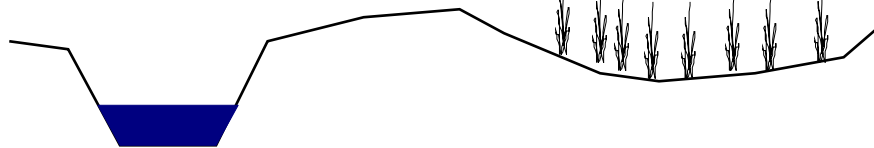
----- Existing waterbody
———— Waterlood waterbody



More room for water and nature



Transport and 'flowing' storage



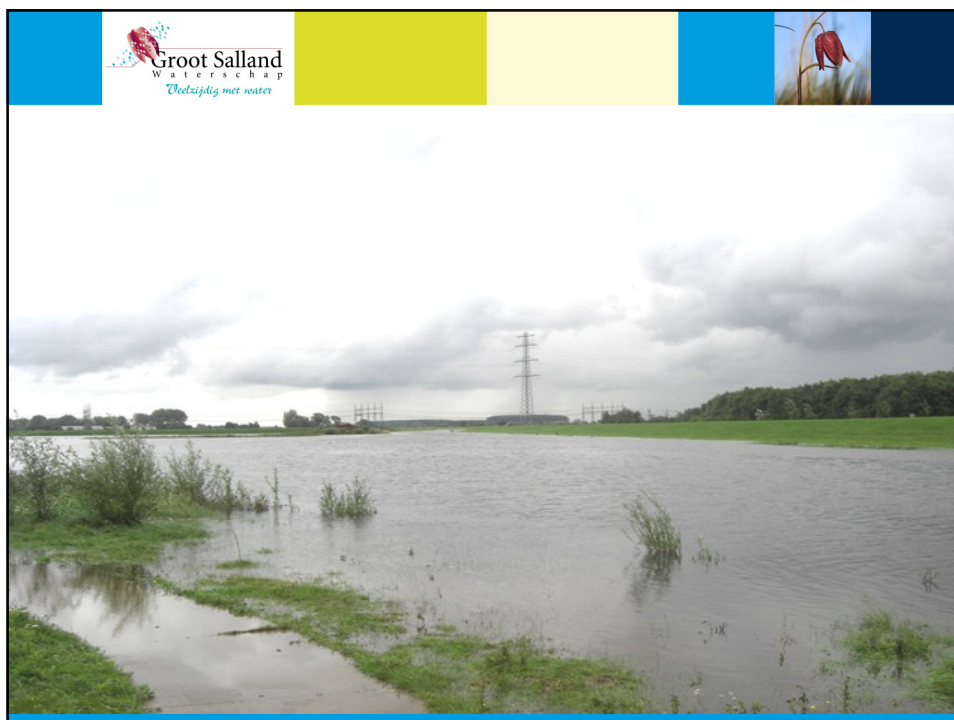
Transport

No 'flowing' storage









Assessment / conclusions

- Regional water authorities in the Netherlands do face climate change issues
- These are being addressed in combination with other issues (such as the WFD)
- There are successes
- But much work still needs to be done