



Rijkswaterstaat
*Ministry of Infrastructure
and Water Management*

Impact of climate change on watermanagement in the Netherlands

Focus on the river Rhine

Vincent Beijk - Rijkswaterstaat

June 2nd 2022



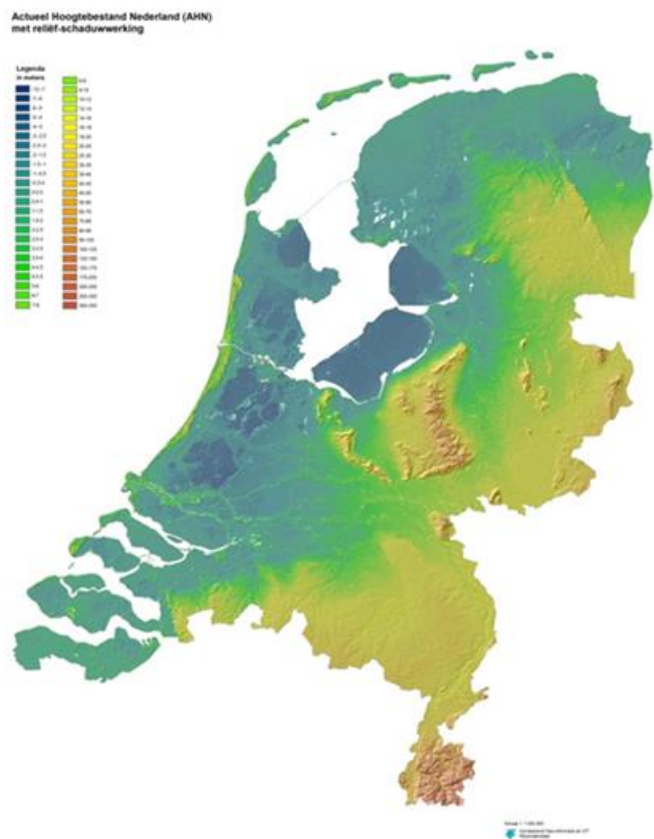
Content presentation

- Watersystem
 - Characteristics
- Watermanagement
 - Purpose and goals
 - Challenges caused by low discharge
- Future developments



Physical geography – sources of fresh water

“high” areas: rain and groundwater



“low” areas: rivers Rhine and Meuse

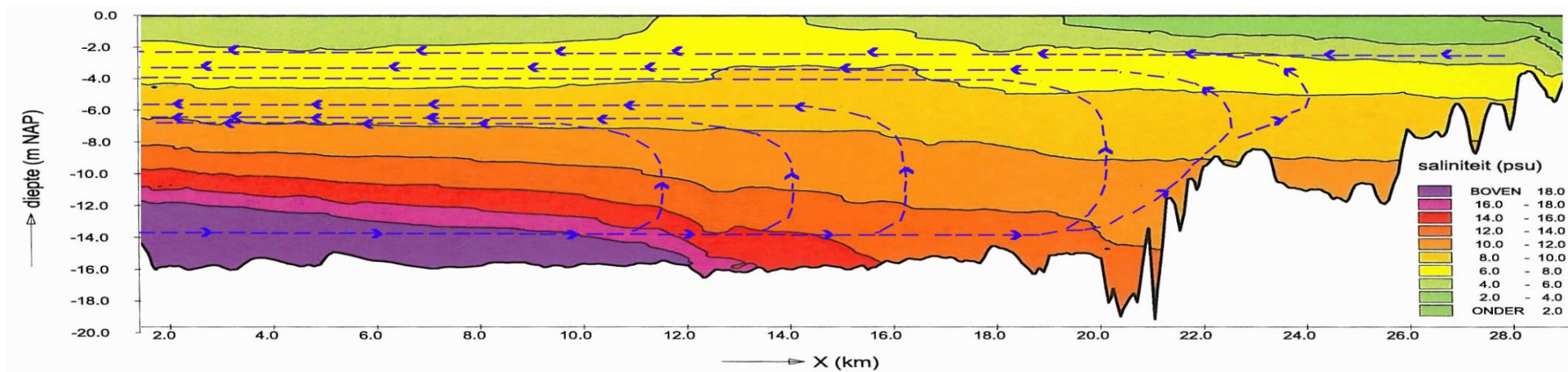
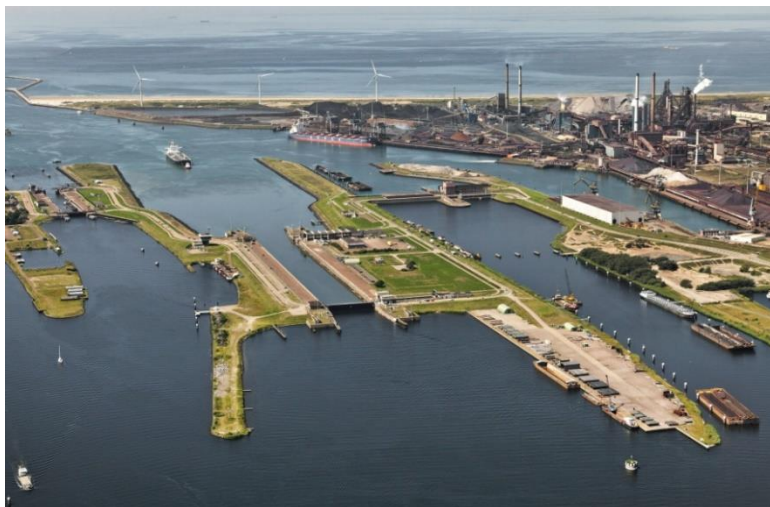




Many stakeholders

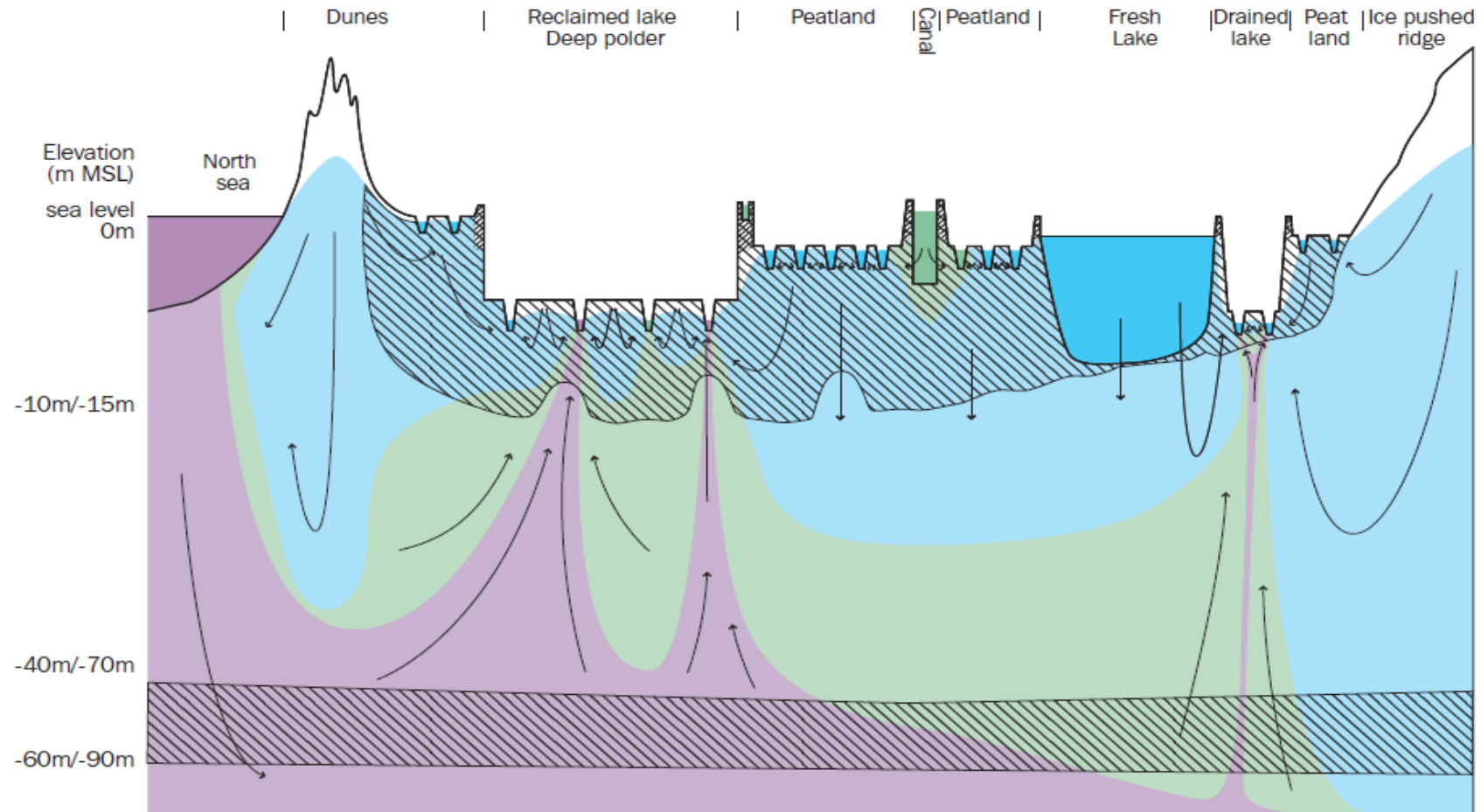








Salt intrusion through groundwater





Main points of concern during low flow of the Rhine

- Watersupply, effects on drinking water, farming and ecology
- Waterdepth, shipping limitations
- Salinization in western parts of the Netherlands
- Water storage in larger reservoirs (e.g. Lake IJssel)



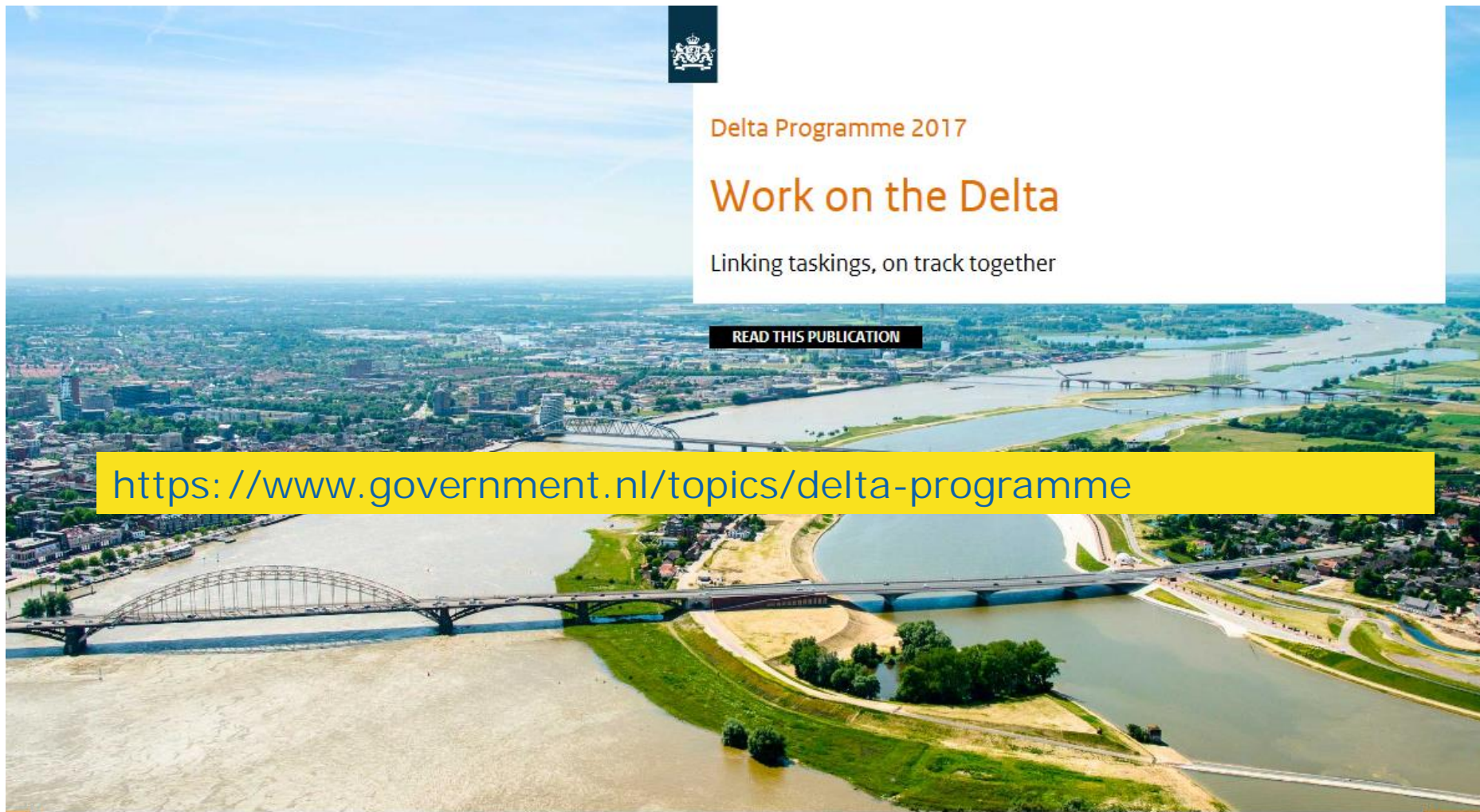
Delta Programme 2017

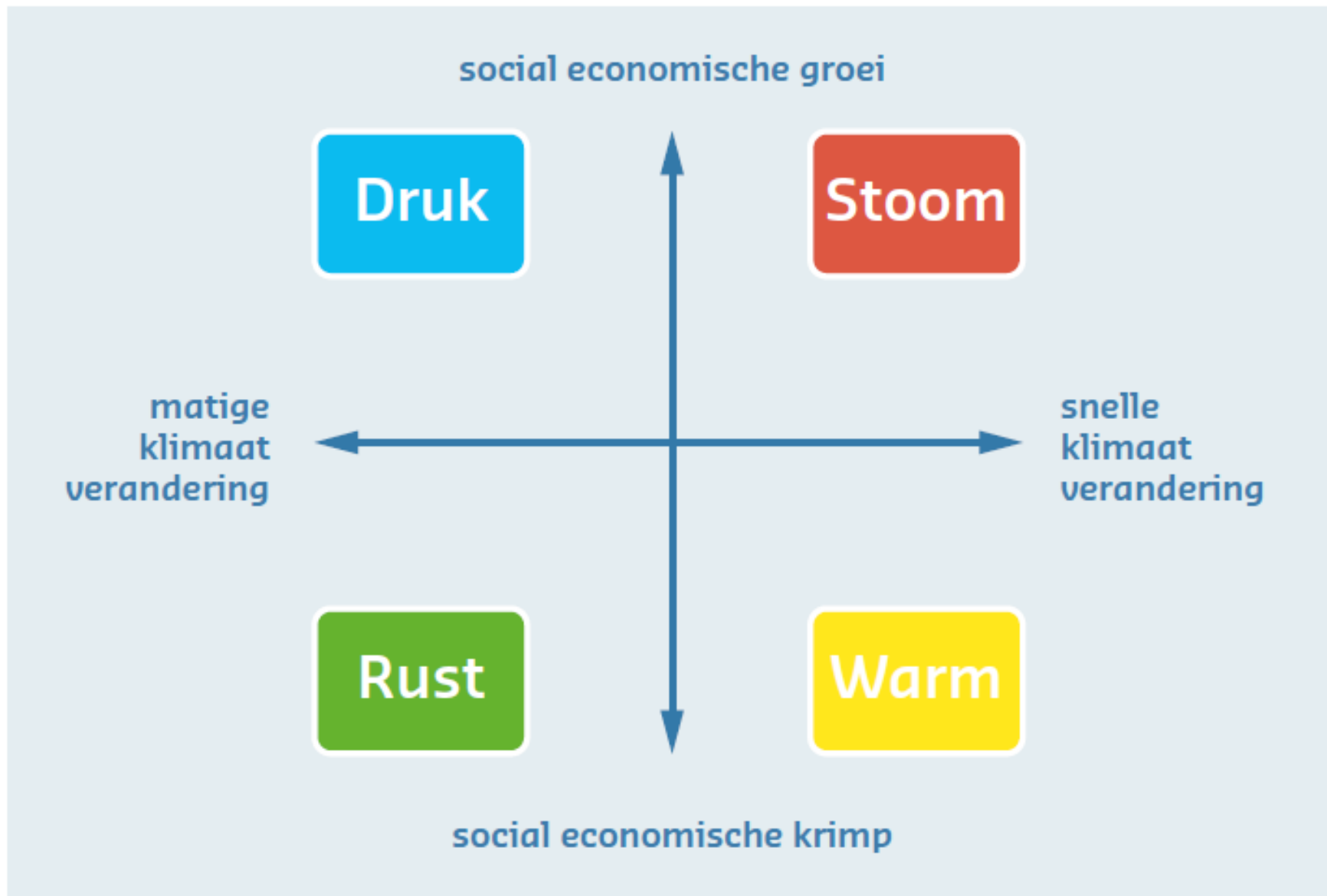
Work on the Delta

Linking taskings, on track together

[READ THIS PUBLICATION](#)

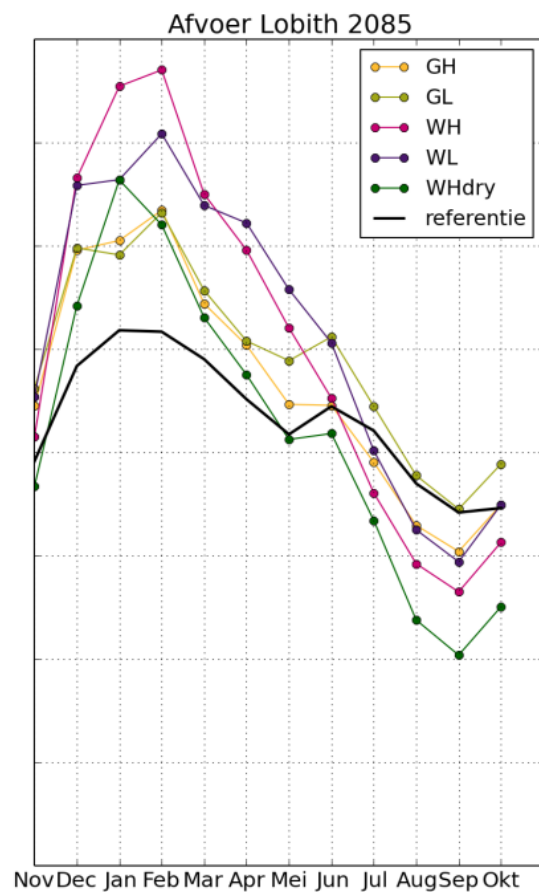
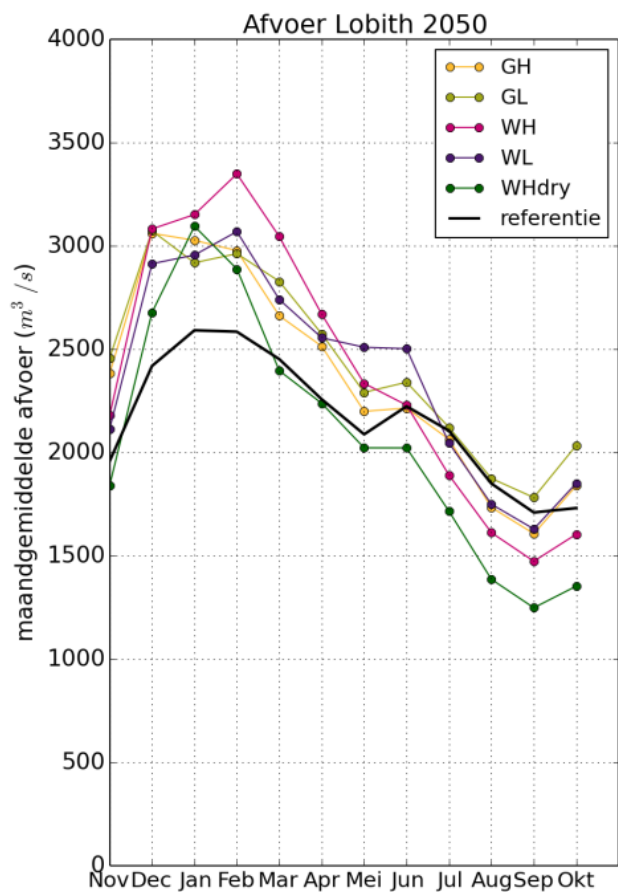
<https://www.government.nl/topics/delta-programme>



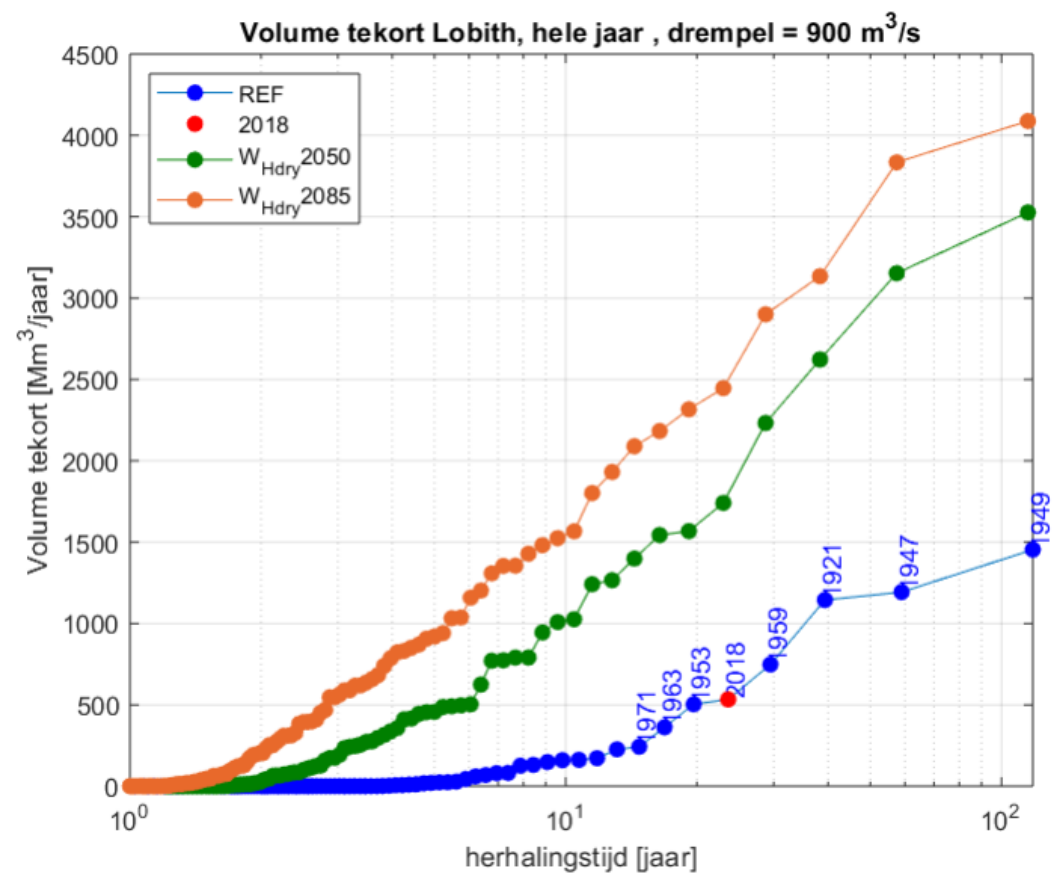




Estimated change in Rhine discharge Lobith



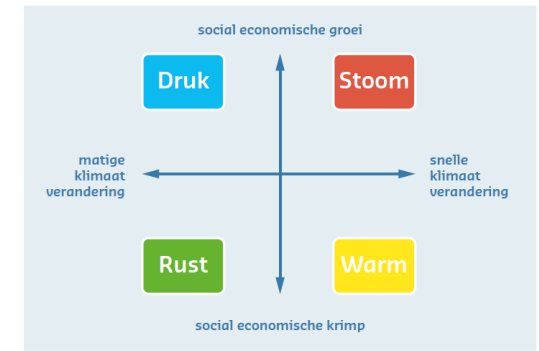
From: Klijn et al, 2015



From: Deltares, 2019



Impacts



- In most extreme scenarios ('Stoom' and 'Warm'):
 - Duration of low discharge Rhine ($T=10$) increases from 1 to 3 months
 - Increase in watershortage due tot increase in water demand:
 - Increased salt intrusion (flushing of the watersystem)
 - Limiting land subsidence due to oxidation of peat
- In the more moderate scenarios ('Rust' and 'Druk'):
 - Little change in low Rhine discharge



Fresh water strategy

- Increased flexibility of the main water system
- Dedicated fresh water reservoirs for storage of fresh water
- More efficient use of existing infrastructure
- Based on 'smart watermanagement'



Current work and relation with ASGII

- Update of climate and social scenario's
 - E.g. based on new IPCC report
- Climate scenario's converted to future Rhine discharge
- ASGII results will be used for assessment