



Adaptiveness in the Dutch Delta Programme
- a critical reflection



Adaptiveness requires:

1. Freedom of movement



2. Tailored agility



3. Informed alertness



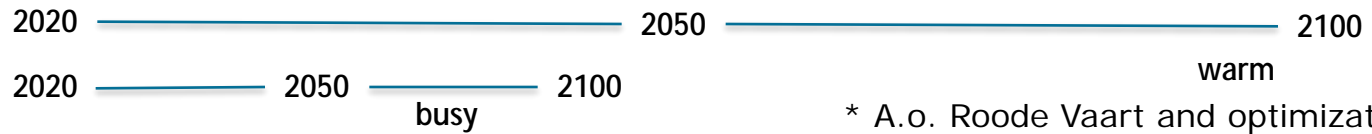
à How were these conditions met in the Dutch Delta Programme?

à What are the remaining challenges?



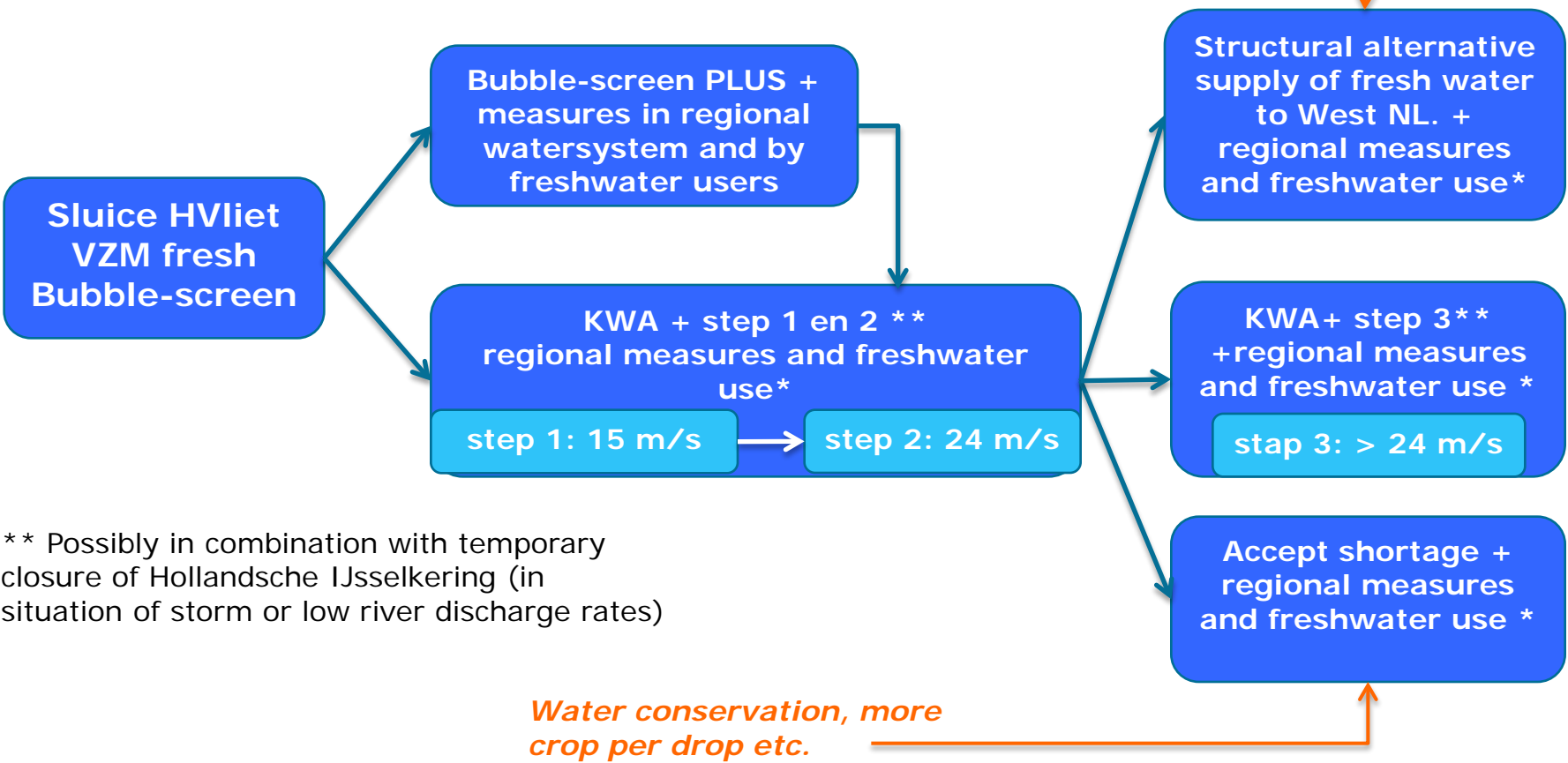
- Floodsafety and freshwatersupply
- Delta Act and Deltacommissioner
- Delta Fund; 1 billion euro/year
- 5 Delta Decisions
- 6 Regional strategies
- 2 Delta Plans
- Adaptive Delta Management





Prepare structural alternative supply

* A.o. Roode Vaart and optimization "Bernisse-Brielsemeer-systeem"



** Possibly in combination with temporary closure of Hollandsche IJsselkering (in situation of storm or low river discharge rates)

Water conservation, more crop per drop etc.



Prepare structural alternative supply



Long term options (> 2050) that are kept open:

Little effort to keep open

1. When replacing **storm surge barrier** Rotterdam additional **design** requirements will be included related to reducing salinisation
2. An additional freshwater **buffer** in the IJssel-lake of 20-30 cm
3. in case of drought: increase water **discharge** from Rhine to IJssel and / or organise transport of water from Waal to Meuse

Considerable effort to keep open

1. Change the discharge **distribution** across the Rhine branches
2. Large **retention area** Rijnstrangen
3. Allow winter water **level IJssel-lake** to rise with sealevel (< 30cm)

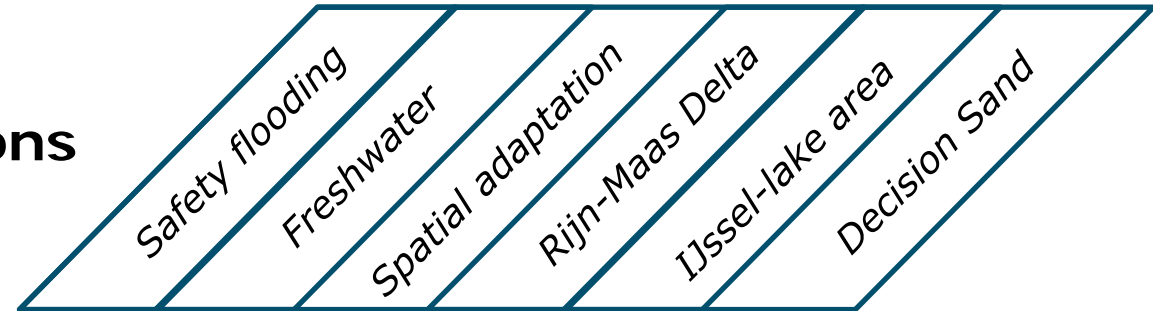
à How was this condition met in the Delta Programme?



2. Tailored agility



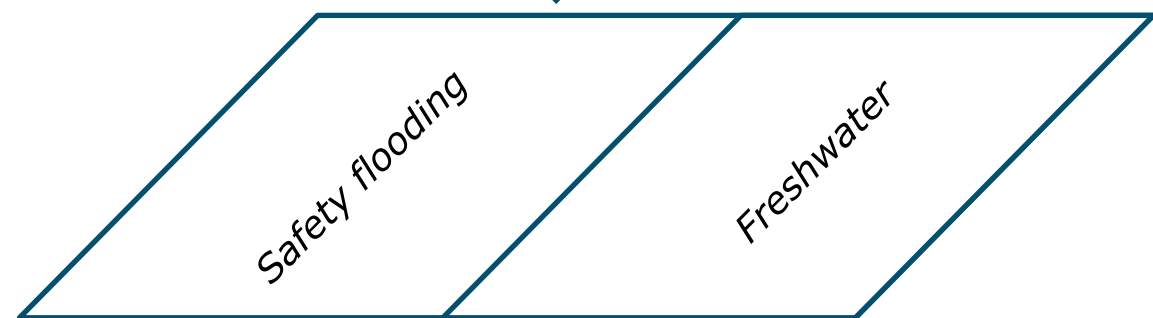
Delta Decisions



Preferred regional strategies



Delta Plans



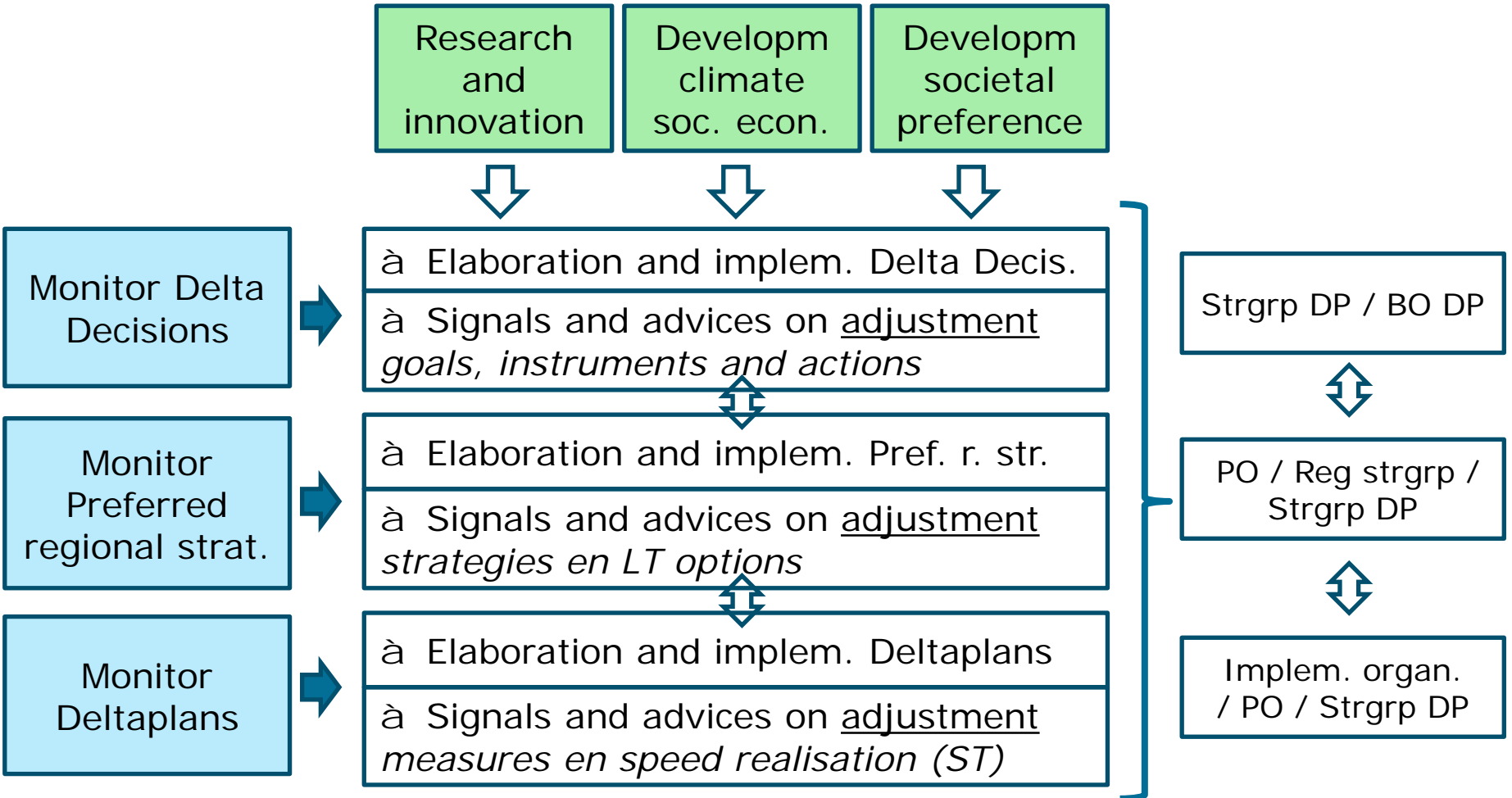
Open for adjustment



à How was this condition met in the Delta Programme?



2. Tailored agility



à How was this condition met in the Delta Programme?



3. Informed alertness



Flood Safety Standards: "Signal Standard" in new law

Increasing waterlevels due to climate change and decreasing strength levees due to aging

Preparations have to start as soon as the Signal Standard is reached

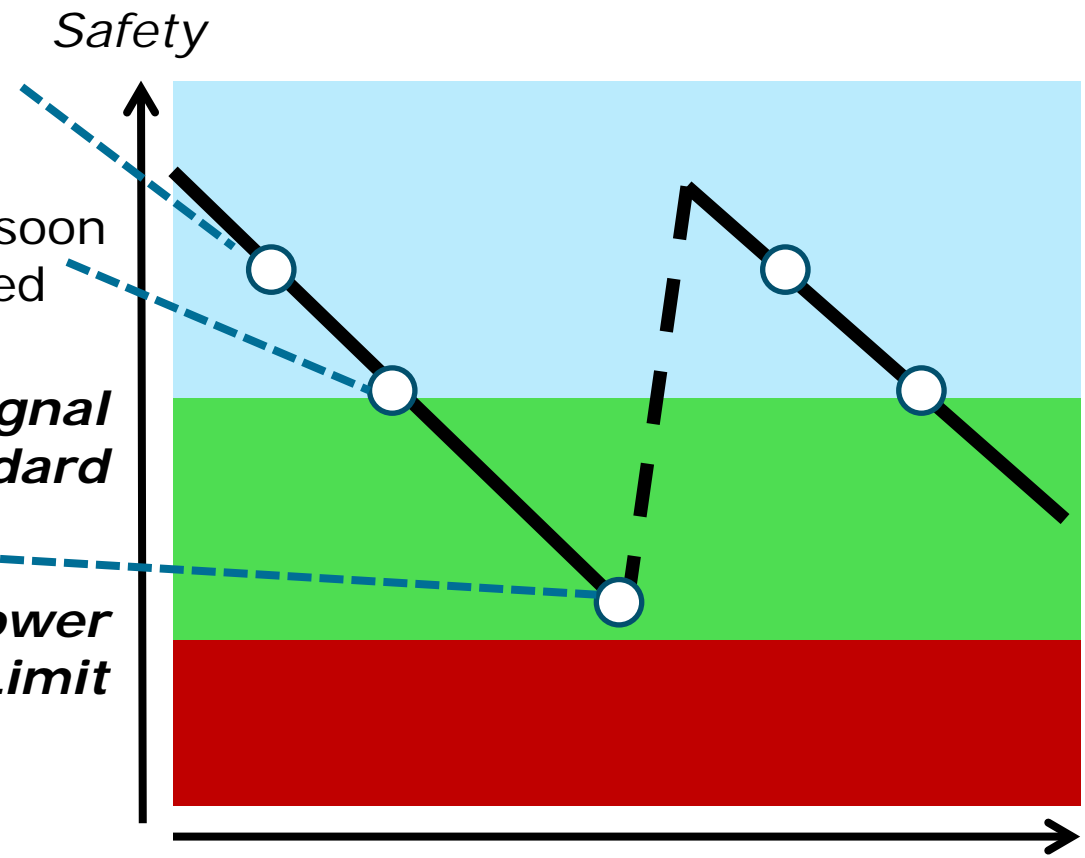


Signal Standard

Work on the levee starts



Lower Limit



Plus: every 12 years check on heighth Lower Limit ("planned adaptation")

à What are remaining challenges?



1. Freedom of movement



Sluice HVliet
VZM fresh
Bubble-screen

freshwater users

and freshwater use*

KWA + step 1 en 2 **
regional measures and freshwater use*

KWA+ step 3**
+ regional measures and freshwater use *

step 1: 15 m/s → step 2: 24 m/s

step 3: > 24 m/s

Accept shortage + regional measures and freshwater use *

** Possibly in combination with temporary closure of Hollandsche IJsselkering (in situation of storm or low river discharge rates)

The freedom of movement you organized can be claimed by others

à What are remaining challenges?

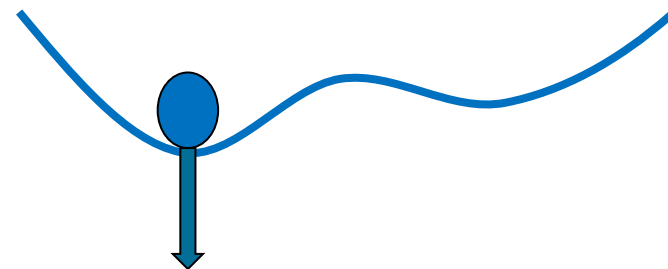


2. Tailored agility



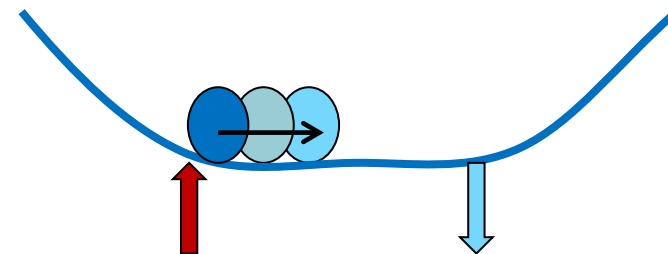
Short term: choice for incremental measures

Invest in resilience of present system



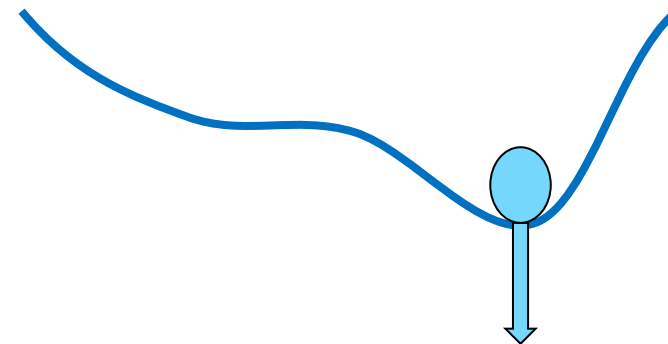
Medium term: prepare the transformation of the system

Tune investments to the planned transformation



Long term: choice for transformational measures

Invest in resilience of new system



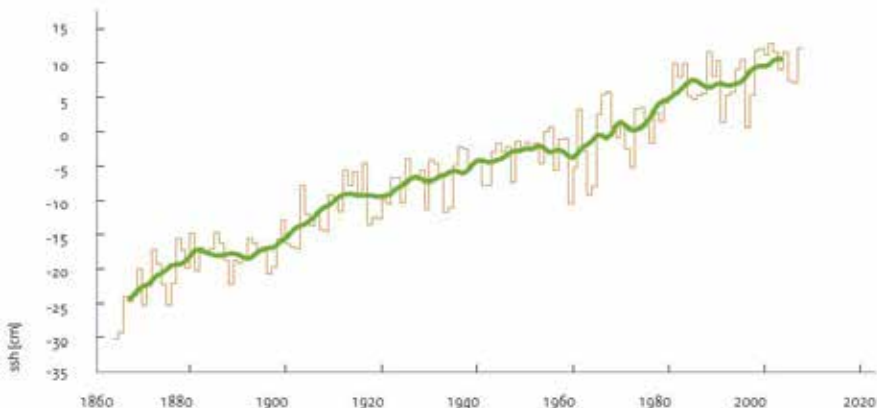
à What are remaining challenges?



3. Informed alertness

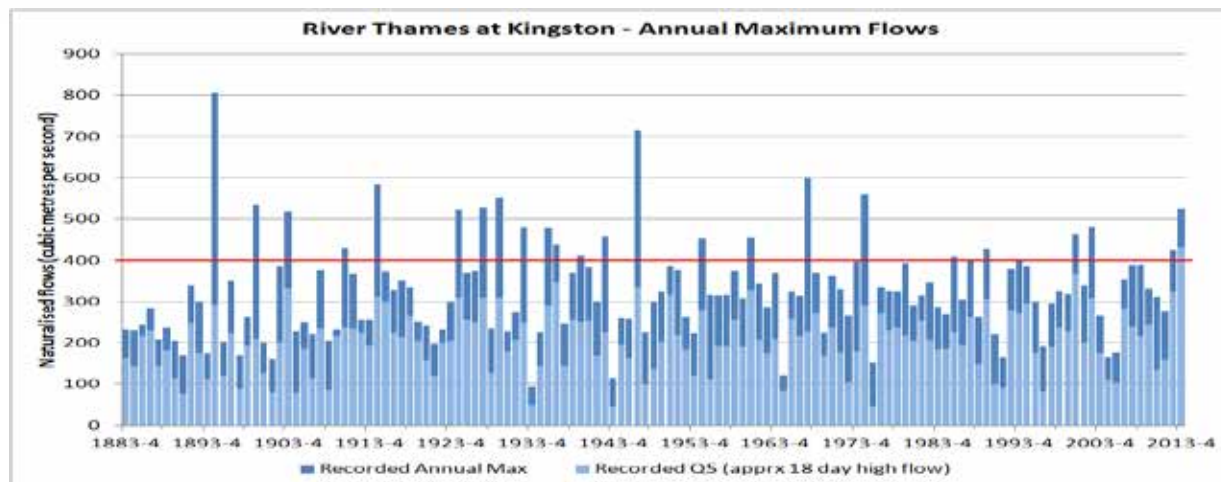


Januari - December zeeniveau Hoek van Holland (150051)

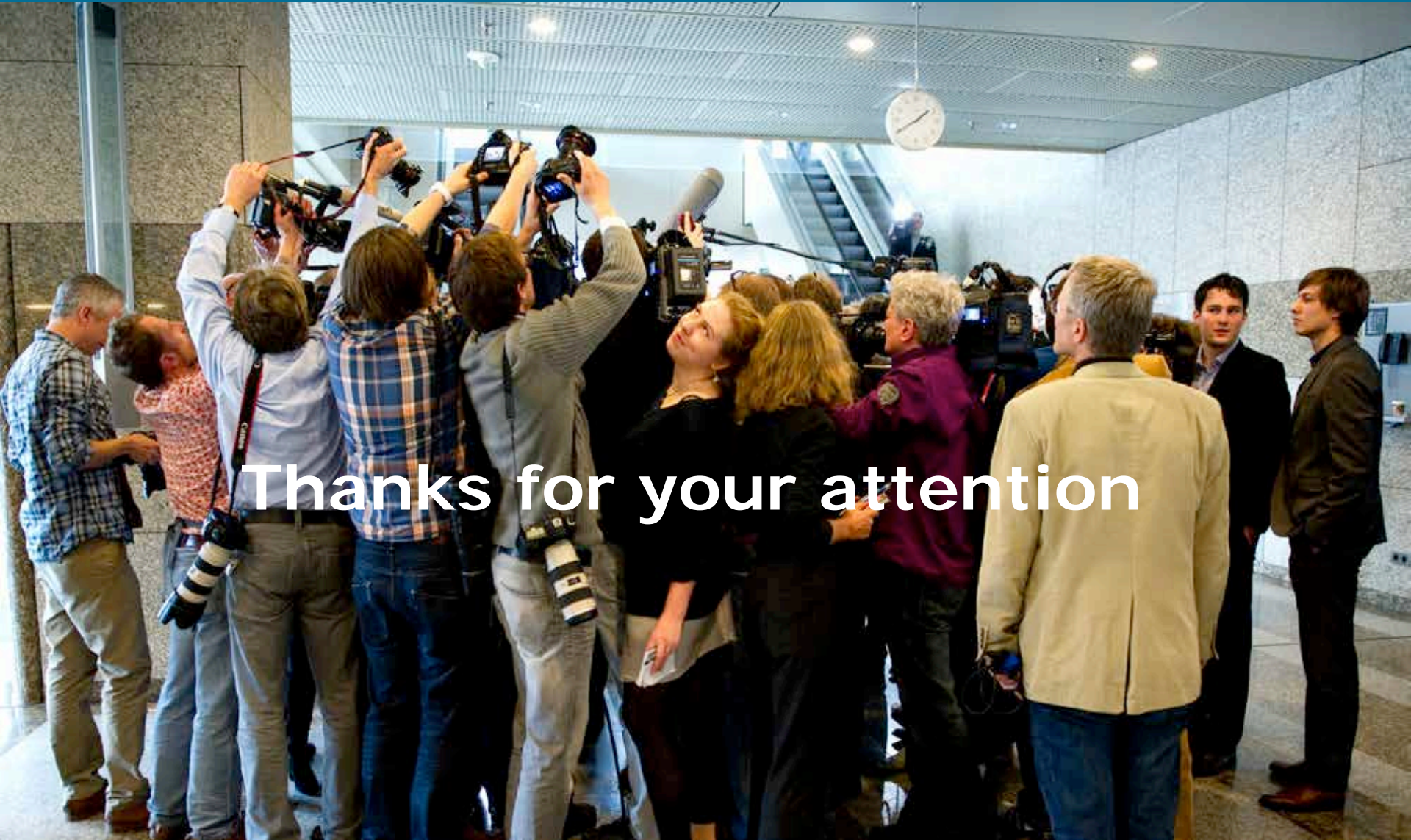


Figuur 3: Gemiddelde zeespiegelstand in Hoek van Holland 1865 en 2007, inclusief bodemdaling. De dikke groene lijn volgt een voortschrijdend 30-jaar gemiddelde in de waarnemingen.

Measured sealevel

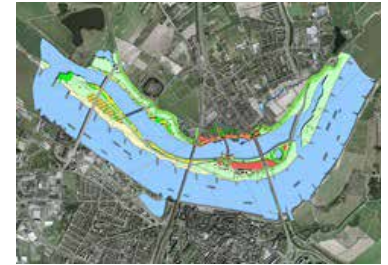


Measured riverdischarge





1. Connecting short-term decisions (in broad physical domain) with long-term tasks (related to floodsafety and freshwatersupply)
2. Thinking in adaptation-pathways instead of endsituations
3. Looking for and 'rating' flexibility
4. Linking with other investment-agenda's (aging infrastr., nature,..)





1. Freedom of movement

2. Tailored agility

3. Informed alertness

