





Policy options for sustainable fresh water supply in saline Delta areas


case South-West Delta – the Netherlands







Context





short term changes and measures:

- re-introduction of estuarine dynamics in lake Krammer-Volkerak-Zoommeer (transition from freshwater reservoir to saline lake)
- compensation measures: alternative fresh water supply to maintain present service level

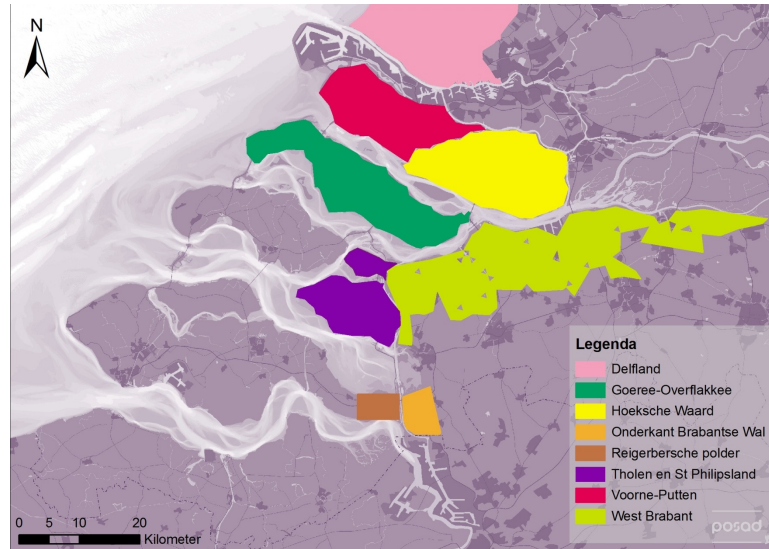
long term questions:

- are these measures climate proof?
- are there alternative options?



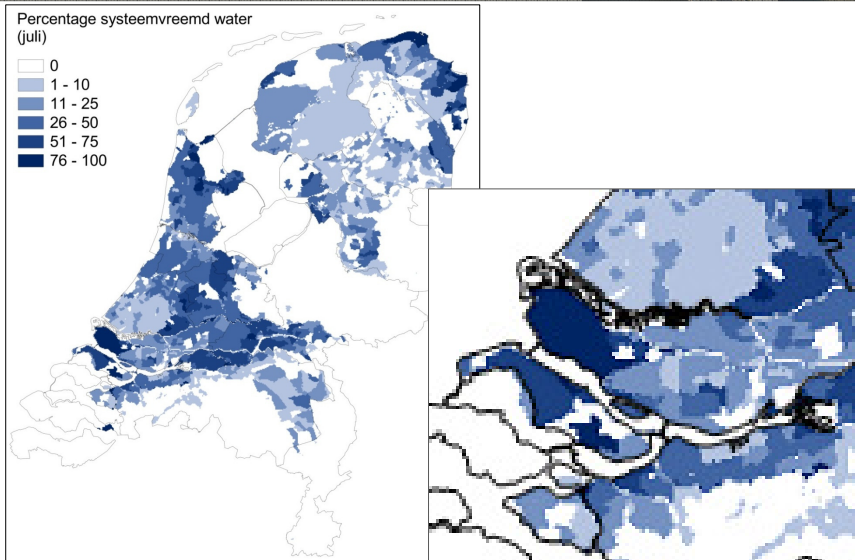


South-West Delta and subregions



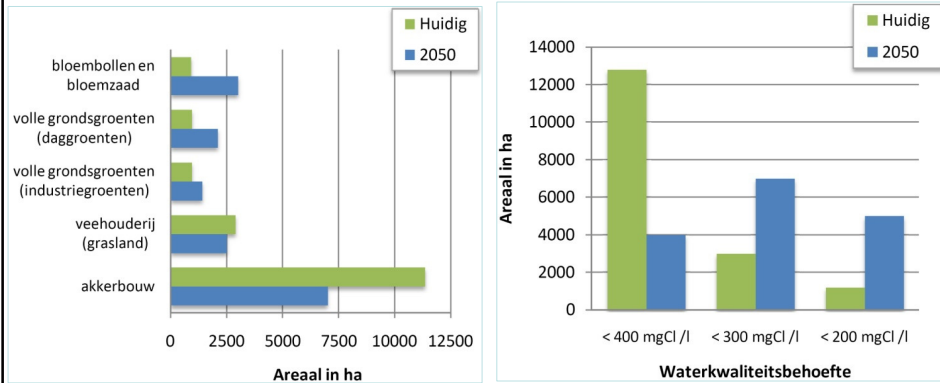
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Dependence on external water supply



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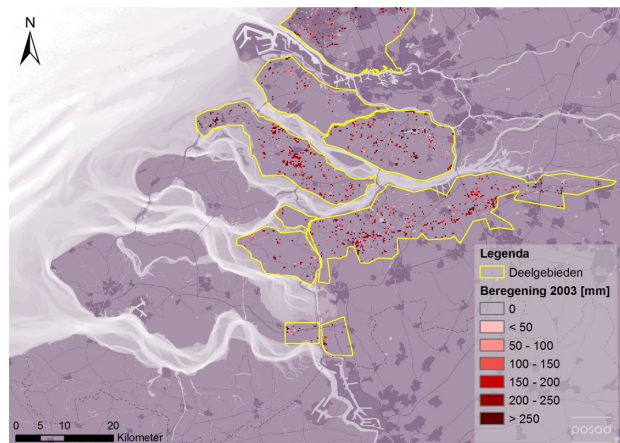
Agriculture: present situation and 2050 (Goeree-Overflakkee)



shift from traditional agriculture (low yield, no irrigation) to high yielding crops (high water demand, sensitive to salinization)

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Sprinkling/irrigation of high yielding crops



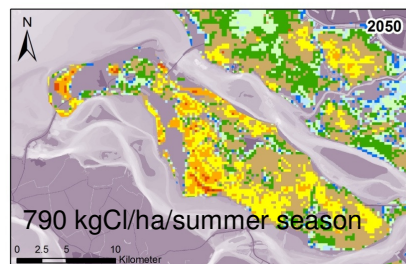
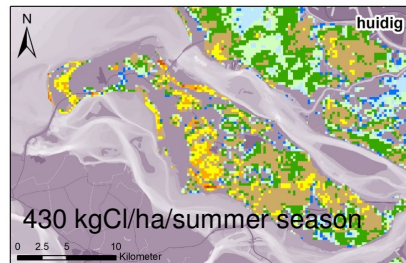
.... only 10 % or less of the area, but

- evenly distributed
- crop rotation

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DV1

Salt loads: present situation and 2050



Legenda
zoutvracht (kg/ha/jaar)

infiltratie
0 - 100
100 - 250
250 - 500
500 - 1000
1000 - 2500
2500 - 5000
5000 - 10000
10000 - 30000
> 30000

- 85 % increase of internal salinization in 2050

- with a distinct spatial pattern

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present situation and expected developments

present situation

- unlimited external water supply; **no shortage**
- **high service level** of regional water supply at low costs
- extensive development of agriculture; **high yielding crops**
- direct relation external supply – high service level – high yielding crops

expected developments

- **decreasing water supply**
 - intentional changes, estuarine dynamics, external salinization
 - non-intentional climate changes, saline seepage, internal salinisation
- **increasing water demand**, both quantity and quality (low salt, < 100 mgCl/l)

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Dia 7

JV1

altijd een beetje mee oppassen dit plaatje. Het kan ook zijn dat de kwelflux toeneemt maar bij gelijkblijvend chloridegehalte. De kg/ha/jr neemt dan toe. Kan ook zijn dat kwel gelijk blijft maar dat het water zouter wordt. Of een combi. Wat is het hier? De relevantie van de vraag is dat consequentie verschillend is.

Jouke Velstra; 17-11-2009

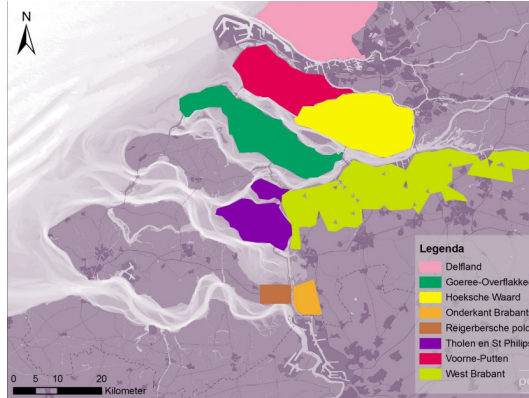
Fact finding: Water balance analysis

3 scenarios

2003: present situation, 10% dry year

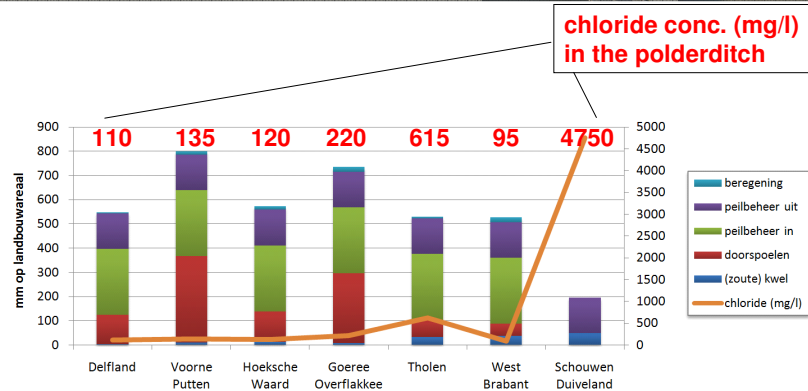
2015: intentional external salinization: saline Volkerak-Zoommeer and compensation measures, alternative supply

2050: climate effect: increased internal salinization



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Waterbalance – present situation

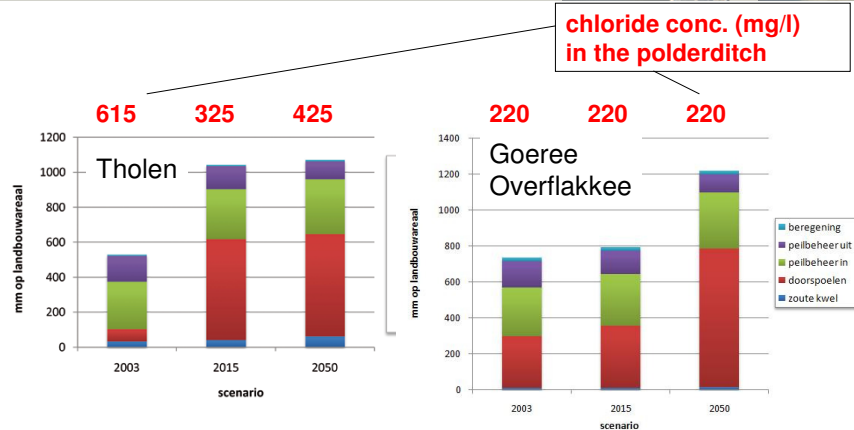


.... Goeree-Overflakkee: Flushing with 100 million m³ to enable 4 million m³ for sprinkling/irrigation

.... efficiency: 4%

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Waterbalance – future scenarios (Tholen and Goeree)



Tholen: external salinization and compensation measures

Goeree-Overflakkee: internal salinisation

..... efficiency decreases to 2-3 %

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Conclusion fact finding

main characteristics

dependence on external water supply

low efficiency

cause

future problems

regional dependence on external sources

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Policy options

Two options for climate proofing

- **resisting** climate change: *supply follows demand*
combatting salinization, maintaining present land use
- **adapting** to climate change: *demand follows supply*
accepting salinization, transition to ?

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Resisting salinization

Continuation of this strategy requires:

- higher efficiency of fresh water management
- by fundamental redesign of water infrastructure

Result

- high service level as **public service**
- decreased dependence on external supply
- better regional self-sufficiency
- no need for water saving by farmers

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adapting to and accepting salinization

Choosing this strategy implies

- separating national and regional watersystem:
enforced regional self-sufficiency
- separating watersystem and land use (agriculture)

Result

- either shift to cultivation of salt tolerant crops,
- or technological solutions for alternative fresh water supply:
shift from public service to **private delivery**

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conclusions

- two feasible options for sustainable fresh water management
 - **combatting salinization**
 - **adapting to and accepting salinization**
- regional self-sufficiency will increase in both strategies
- perspectives for agriculture development are entirely different between the two options
- combining strategies within one region is (probably) sub-optimal
- choosing between strategies is necessary, but not urgent

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