

# 'Halophyte filters': exploring preconditions for effective saline treatment wetlands

Maurice Paulissen & Pieter Slim



# Background

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- Increasing salinity pressure on Dutch coastal plain
- Opportunities for saline agriculture/aquaculture
- Sustainability, closed nutrient cycles, food safety
- Saline treatment wetlands
  - Purification of nutrient-enriched saline water (nutrients, organic matter, pathogens)
  - Part of coastal defence zone (e.g. between double dikes)
  - Increase natural values of modern agricultural landscapes

# Saline treatment wetlands

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- Relatively poorly documented
- Nutrient removal efficiencies?
- Which salt-tolerant plant/algae species?
- Economically viable ways of processing or reusing residual sludge and biomass?
- Greenhouse gases (CH<sub>4</sub>, N<sub>2</sub>O)
  - Typical emission rates?
  - How to minimize emissions?

# Suitable species

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## ■ Vascular plants

Species	Height (m)	Allowable water logging regime	Relative salt tolerance
<i>Spartina anglica</i> (Common Cordgrass; Engels slijkgras)	0,20 - 1,30	occasional	* * * *
<i>Bolboschoenus maritimus</i> (Sea Club-rush; Zeebies)	0,15 - 1,50	permanent	* * *
<i>Schoenoplectus tabernaemontani</i> (Grey Clubrush; Ruwe bies)	0,50 - 2,80	permanent	* *
<i>Phragmites australis</i> (Common Reed; Riet)	1,00 - 3,00	permanent	*

## ■ Macroalgae

## ■ Microalgae

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# Preliminary removal efficiency indicators

- Organic matter and pathogen removal efficiencies of 90 – 99 %
- N and P removal efficiencies of 10 – 15 % (probably higher in subsurface-flow wetlands)

# The project

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- IP/OP-funded
- 1-year desk study
- Literature review, interviews
- Alterra report, article in Dutch professional paper
- Contribution to successful application

# Zeeland 'inlagen'



# Zeeland 'inlagen'



Molpheta & Van Wonderen 2009

# Thank you

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