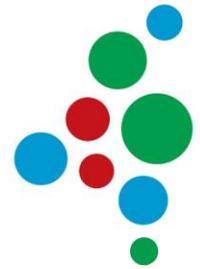


# Kennis voor Klimaat

## Knowledge for Climate



Project

Theme 2 | Nature and salinity

### Description of research

It is expected that climate change will cause longer and more intense droughts during summer in the Netherlands. With the resulting low river discharges, surface water salinity could increase temporarily. This may affect nature areas that depend on fresh surface water.

Floating fens consist of floating mats (*kraggen* or *zudden*), formed by roots of plants, on which peat accumulates. These floating root mats often host a diverse vegetation, including many red list species. In the Netherlands, these fens are found in the lower areas, for example in the Nieuwkoopse Plassen, the Vechtplassen and the Weerribben.

The objective of this research project is to get insight in both:

- *Exposure* of fen plants to surface water salinity
- *Effects* of temporary surface water salinity on fen plants

Field measurements, laboratory experiments and computer modelling are the selected methods to better understand water flow and solute transport in root mats. A greenhouse experiment is conducted to assess the effects of salinity on fen plant species.

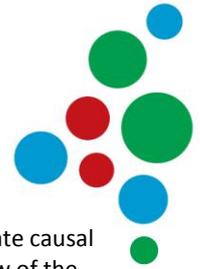
### Research question

How will plant species of floating fens be exposed to and affected by a temporary increase of surface water salinity?



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### The most important conclusions

- In preliminary results we found large differences between water flow and solute transport parameters for different zones within the soil. We need to study more samples to see if the results form consistent patterns, and if they can be related to the development history of the soil.
- From preliminary results, surface water seems likely to intrude the root zone of the vegetation zones closest to the edge of the root mat during dry periods.
- From literature study we found that some of the species that are found in floating fens, do not occur in areas that are slightly more brackish. This can be due to their salinity tolerance limits, or be the result of other (ecosystem) processes. For some of these species, this will be further tested in the greenhouse experiment.



### Bottlenecks of the project

- It is generally difficult to demonstrate causal relations in situations in situ, in view of the large complexity of natural systems.
- Floating fen soils are very different from most soils, due to their fibrous structure. Little is known about their physical properties. We needed to adapt many field and laboratory techniques to work for this material.
- It is risky to test the effects of salinity directly in a nature area. Furthermore, we would need a dry summer period to do a field experiment, which cannot be counted on in the Netherlands. Therefore we choose to do a greenhouse experiment instead.
- Besides salinity, other risks are associated with the inlet of river water into natural areas. A combination of processes may lead to different effects on the vegetation.

### Opportunities for the project

- Salinity is a 'hot topic', as was clear on the 'Zoet-Zout' network days in Texel. Much research is currently being done, this provides opportunities for cooperation.
- There has been interesting information exchange with water managers (Hoogheemraadschap Rijnland) and nature managers (Natuurmonumenten). Their information is useful for my research, and I hope my results will be useful for the management of water and nature.
- The hydrological part of the research could be used for studies of other substances besides salt. For example, it could be extended to study the transport of nutrients or contaminants within the soil.

### More information

For more information about this project, please contact:

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### Possible application of the project

The results may help water and nature managers in developing policy regarding future drought scenarios. In these scenarios fresh water may become temporarily more scarce and the strict salinity standards that are used today are difficult to maintain. This research may provide them more information to base their decisions on.