WAGENINGEN UNIVERSITY
ENVIRONMENTAL SCIENCES

Saline threats for agriculture, saline opportunities for ecology

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Introduction

In the Dutch coastal zones fossil seawater causes saline upward seepage which is counterbalanced by a fresh water precipitation lens (Figure 1). This fresh water lens is crucial for crop production and natural vegetation, but diminishes during the growing season, as a result of higher evapotranspiration demand. This might result in salinity stress for crops and natural vegetations during some part of the growing season.

Figure 2. Vegetation gradients, Boschplaat, Terschelling

Objectives

Improve the understanding of the interaction between saline and fresh water lenses and the consequences for agricultural and natural vegetation.

• Gain insight in field-scale processes of fresh/salt water flow dynamics in the unsaturated zone.

• Quantification under which conditions agriculture remains sustainable and under which conditions nature development is inevitable.

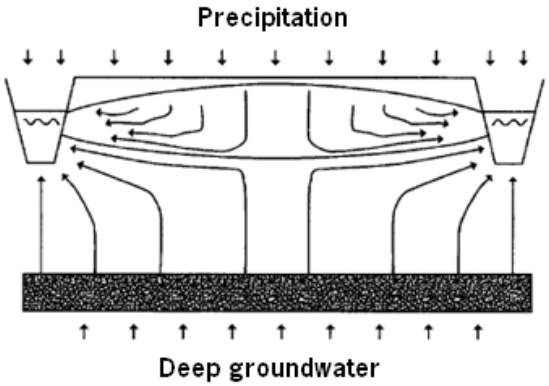

Figure 1. Schematic presentation of a fresh waterlens (Poot & Schot, 2000)

Approach

• Monitor water flow dynamics on 2 agricultural and one natural vegetation site to gain insight on the field-scale dynamics.

• Literature research and releves of natural vegetation (Figure 2) should give an idea on the salinity bounds of plant species (Figure 3).

• Numerical modeling for analyzing flow dynamics and the consequences for plant water uptake.

Figure 3. Tomatoes with salt damage

Expected results

To integrate knowledge on spatiotemporal variability of biotic and abiotic processes in order to provide a basis for water management decision making as well as crop decision making and nature development for the Dutch coastal zones.

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