

Autonomic and Climatic Impacts on the Dutch Coastal Groundwater System

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Autonomous processes

- . Land subsidence
- . Anthropogenic activities:
 - . groundwater exploitation
 - . water level management

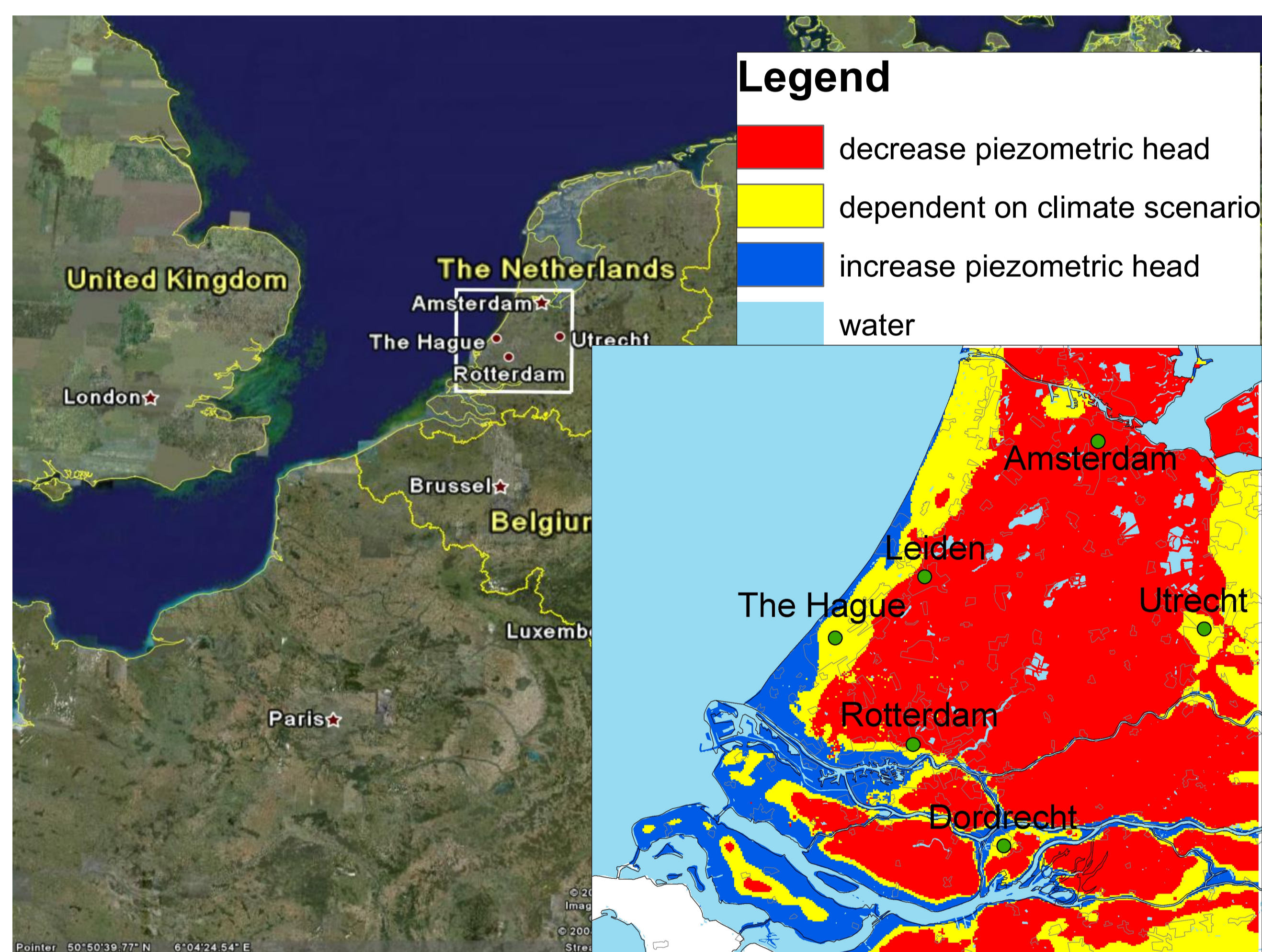
Climate change

- . Sea level rise
- . Changing precipitation and evapotranspiration

Groundwater system

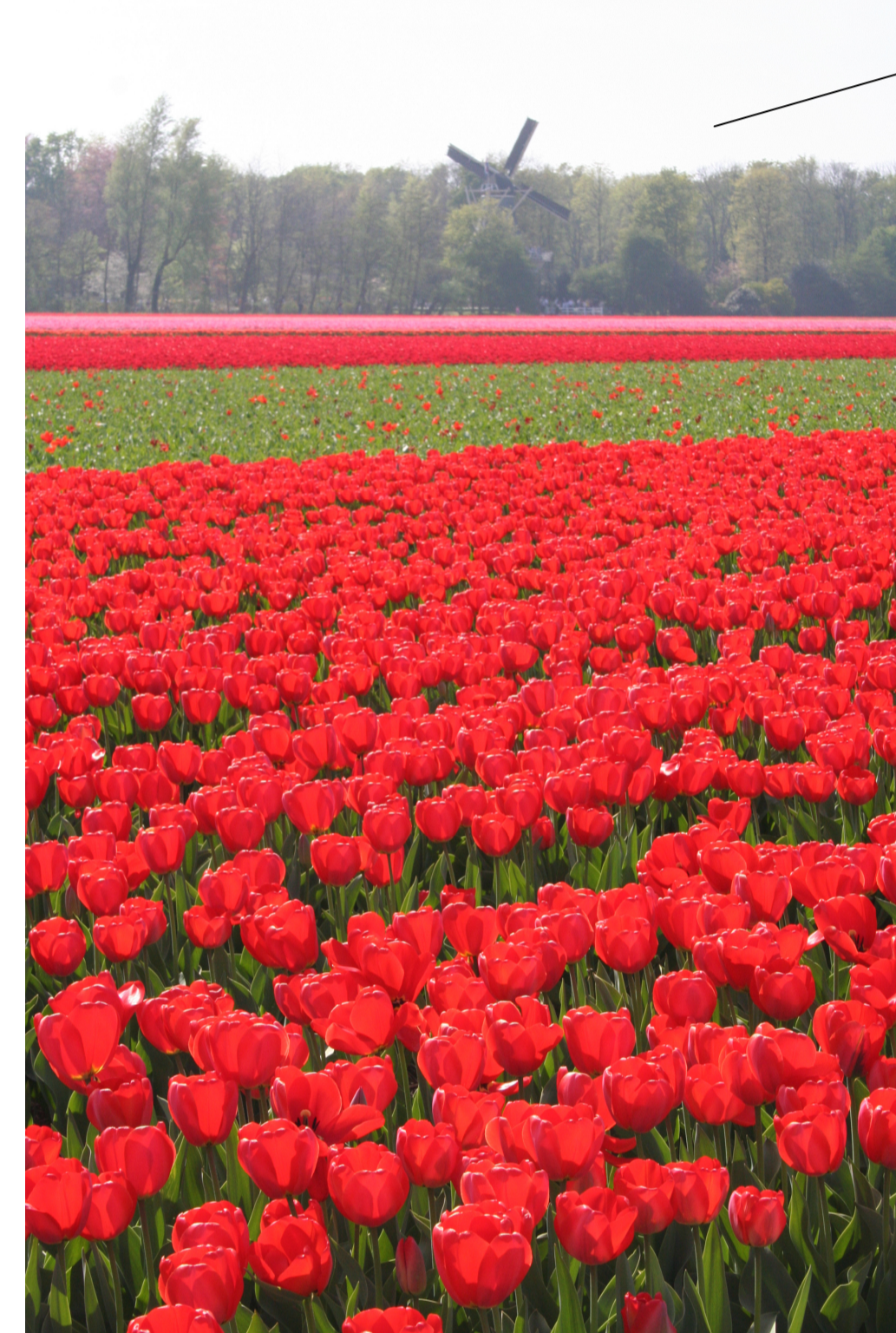
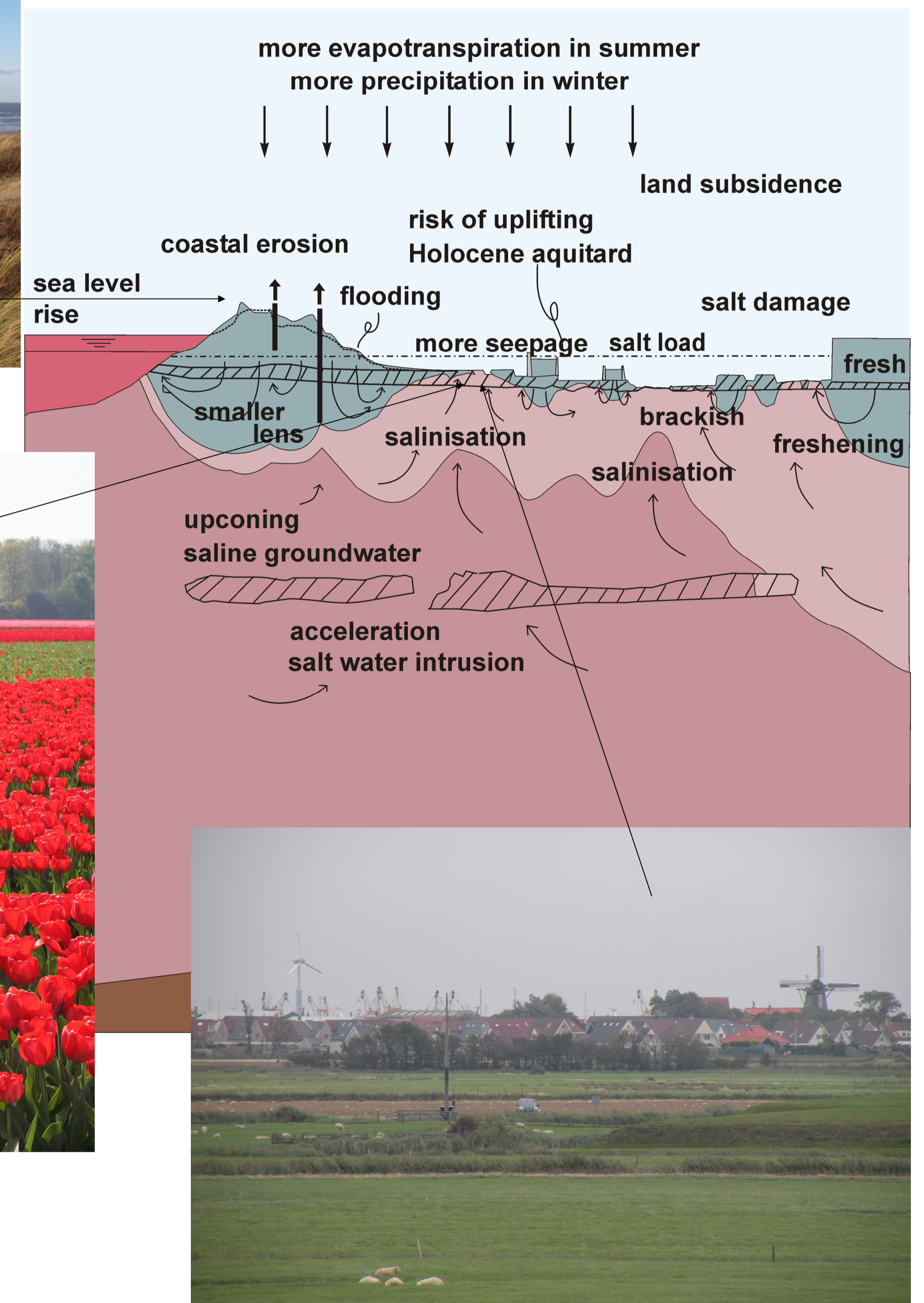
- . 40% of the Netherlands below sea level
- . Presence of saline groundwater

Change in piezometric head



A 3D model quantifies changes in groundwater flow and salt concentrations

- . Impact sea level rise only at areas < 10 km from the coast
- . Decreasing piezometric heads due to land subsidence more inland

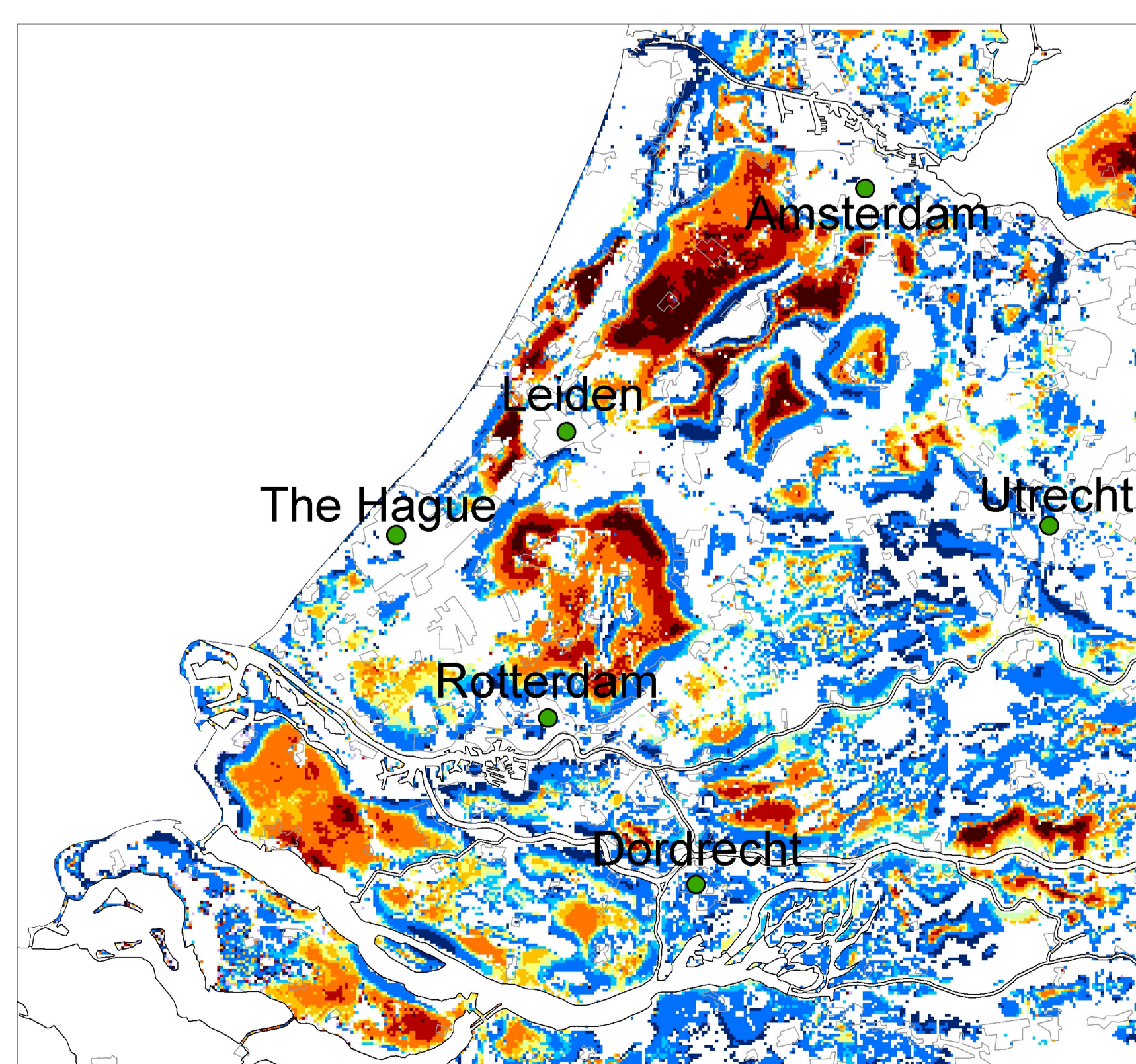


Change in saline seepage

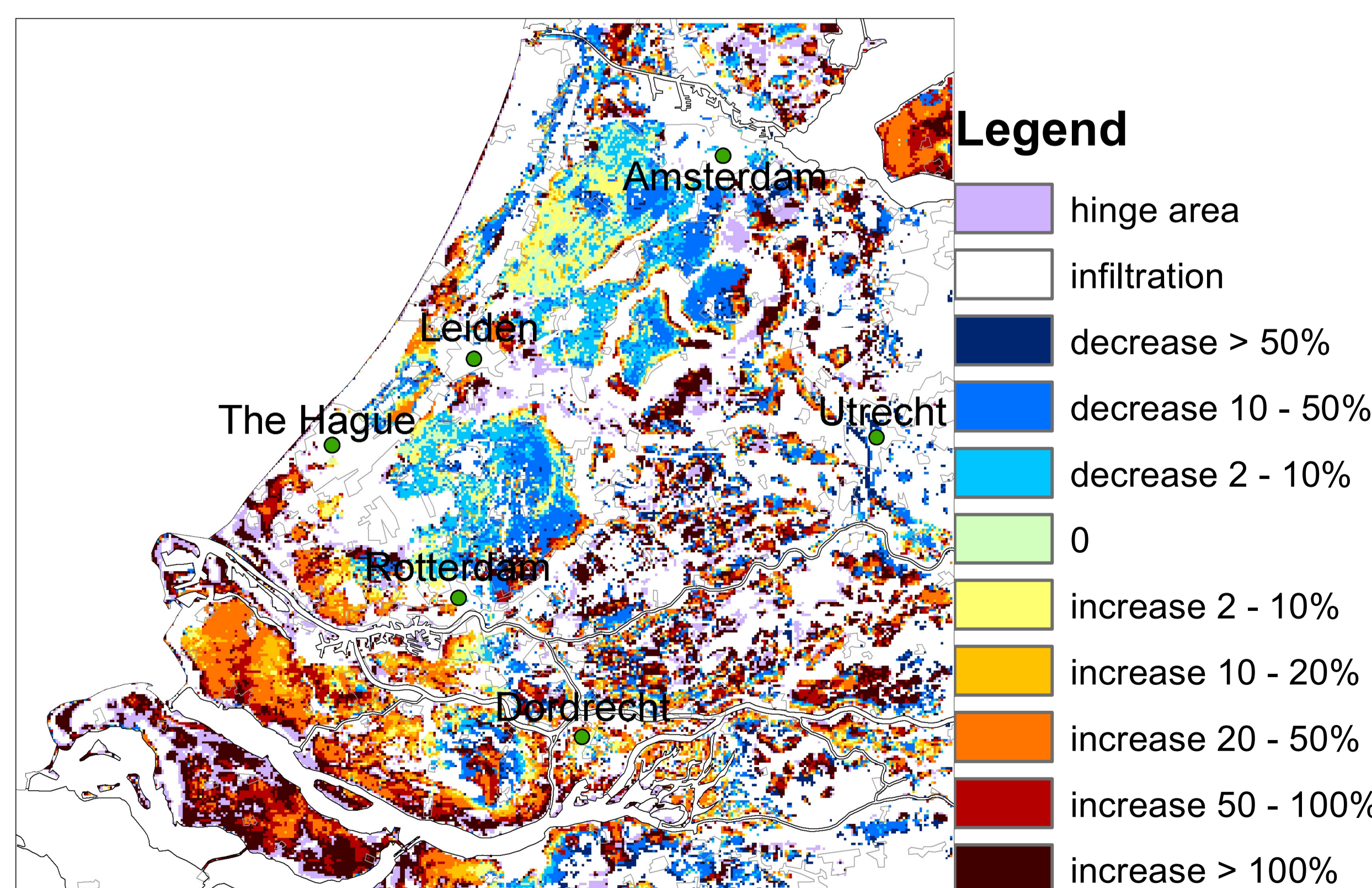
Autonomous process:
 increase saline seepage in low lying polders

Climate change:
 extra saline seepage due to sea level rise in coastal areas

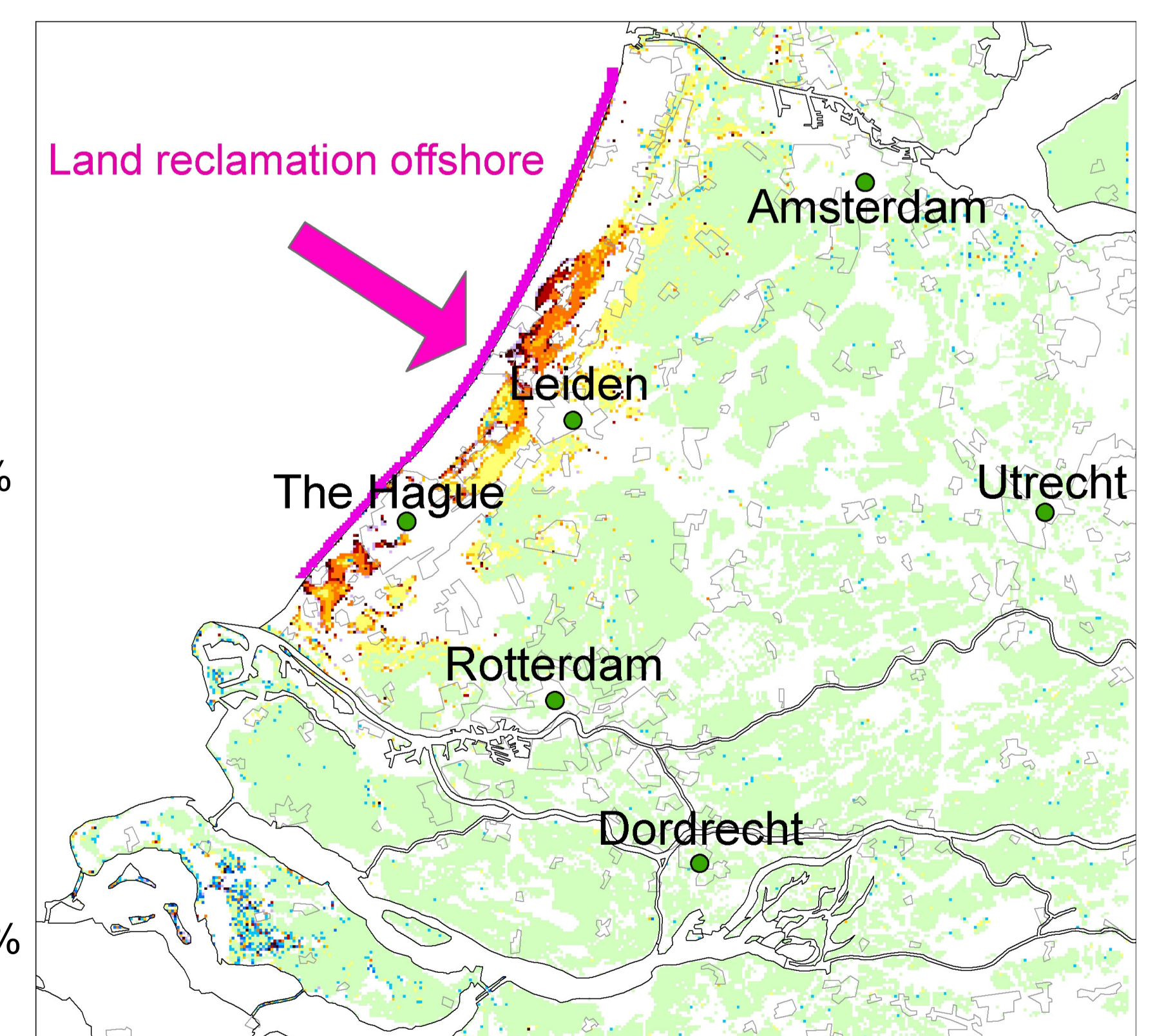
Adaptive measurement:
 land reclamation offshore causes extra saline seepage



Autonomous process, 2100



Climate scenario 2100 (increase precipitation winter and summer and 2 m sea level rise)



Extra salt seepage due to land reclamation offshore, 2100