

## Paper on Salt Water Intrusion

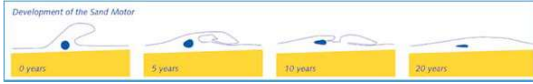
S. Huizer<sup>1,2</sup>, M.F.P. Bierkens<sup>1,2</sup> and G.H.P. Oude Essink<sup>2</sup>

<sup>1</sup>Department Physical Geography, Utrecht University, Utrecht, Netherlands

<sup>2</sup>Unit Subsurface and Groundwater Systems, Deltares, Utrecht, Netherlands

### ABSTRACT

In many coastal regions around the world climate change will lead to a sea level rise and an increase in extreme weather conditions. This prospect has resulted in a new focus on coastal protection in the Netherlands, resulting in the initiation of an innovative coastal defence project called the Sand Motor. In this project a large body of sand or so-called mega-nourishment has been constructed along the Dutch coast. This body of sand will be distributed slowly along the coastline by wind, waves and currents. Keeping the coastal defence structures in place and creating a unique, dynamic environment with changing morphology over time.



Because of the large size of the body of sand (21.5 million m<sup>3</sup>) and the position at the coastline and near coastal dunes, the Sand Motor might cause a substantial increase of the fresh water availability by increasing the volume fresh water lens underneath the dunes. This creates an opportunity to combine coastal protection with an increase of fresh water resources in coastal regions.



With a three dimensional, density dependent, groundwater model the effects of changing morphology over time and the potential increase in fresh water availability have been studied. The groundwater model encompasses a region of 11.5 by 6 km around the Sand Motor, including the nearby coastal dunes and low lying polder systems. The presentation will elaborate on the challenges in the modelling of a dynamic coastal system with changing boundary conditions and the potential increase of fresh water resources by the Sand Motor.



**Contact Information:** Sebastian Huizer, Utrecht University, Department Physical Geography, Heidelberglaan 2, Utrecht, 3583 CS Netherlands, Phone: + 31 030 2532367, Email: s.huizer@uu.nl