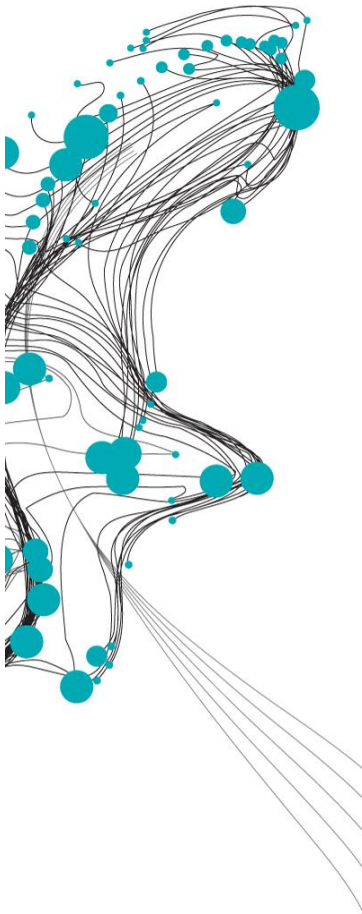


PROCESS-BASED SUPPORT FOR SUPPLY LIMITATIONS ON THE AEOLIAN EROSION PROBABILITY: FROM AEOLIS TO DUBEVEG



This thesis was developed to give the probability of erosion " P_e " in DUBEVEG (one of the key parameters in the model) a process-based support to include soil moisture and beach armouring as supply-limited conditions, from AeoliS. The project was divided in three parts which are described below, together with their results.

The first section, "Morphological influence due to DUBEVEG's parameters" consists of the determination of the appropriate key parameter in DUBEVEG to support supply-limited conditions, which was concluded to be the probability of erosion P_e .

Afterwards, the section "Process-based support for a cellular automata model" describes the steps taken in order to obtain a process-based P_e from AeoliS to DUBEVEG. This was done by simulating the sediment that was transported by aeolian forces from a single cell. This sediment flux accounted for the change in bed elevation, which was converted to a yearly probability of erosion. The latter was done by out-casting the situations that would lead to depositional effects from surrounding cells, on the single cell evaluated.

The last section, "Sensitivity analysis of environmental conditions" includes a deeper understanding of the obtained P_e from AeoliS and how this is influenced by the two supply-limited conditions assessed. This was done by varying the environmental conditions that affect the supply-limited conditions over the cross-shore. It was concluded that the influence of the supply-limited conditions on the cross-shore can be divided based on an intertidal area (which presents a dominant supply-limitation by soil moisture and presents hydraulic mixing), a supratidal area (which depicts the influence of soil moisture, hydraulic-mixing, sediment sorting and armouring, all together) and a dry area (which has a dominant supply-limitation due to beach armouring).

Andrea Flores

Graduation Date:
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Graduation committee:
University of Twente
Prof. dr. K.M. Kathelijne
Wijnberg
Ir. D.W. Poppema

Deltares
Ir. J.P. den Bieman
Ir. B. Van Westen

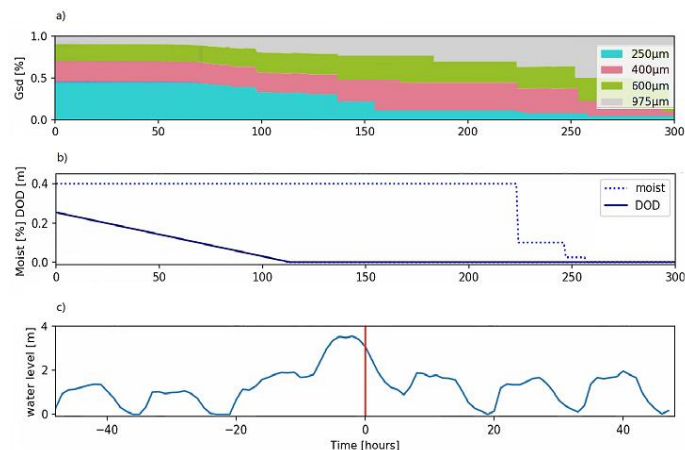


Figure 1: a) Shows the grain-size variation over the cross-shore due to different environmental conditions. b) Depicts the soil moisture and the cover of hydraulic mixing over the cross-shore. Here, DOD is the depth of disturbance. c) Shows the current 3.7 m water level in a water level time series of 96 hours

References

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