Oral presentation *Pre-doc level*

Dune behaviour along the Belgian coast

Strypsteen Glenn and Rauwoens Pieter

KU Leuven, Departement Burgerlijke Bouwkunde (KULeuven-BWK), Kasteelpark Arenberg 40, Bus 2448, 3001 Heverlee, Belgium
E-mail: glenn.strypsteen@kuleuven.be

The behaviour of the dunes along the 67 km Belgian coast has been investigated based on a data set of annual surveys dating back to as early as 1979. Depending on the amount of wind-blown sediment input and dune erosion, dune volume changes over time. Worldwide, dune volume is an important factor for coastal safety which provide protection for the hinterland against storms. Dune volume changes along the Belgian coast are generally between -50 and +50 m^3/m. Between each survey there is considerably longshore variability in dune volume change. Furthermore, large differences in dune volume change are found between each year. Dune volume change along the Belgian coast mainly show a positive linear trend in time (dune growth). It is found that half of the coastal sections with dune growth have correlation coefficients larger than 0.9. This indicates that a large part of the dune volume data is well represented using a linear model in time. Variations in wind-blown sediment input to the dunes from survey to survey, along the Belgian coast were calculated based on a modified Bagnold model for the period 2000-2017. The wind regime consists of a fairly balanced mix of moderate (85% of winds are below 8 m/s) onshore, offshore and shore-parallel winds. Wind speeds between 8-10 m/s take the largest portion of the total sediment transport. The mean direction of potential transport over all years is 260 ± 14° to the North, indicating that the direction is fairly constant. For some years, potential transport is up to 3 times larger than other years. However, no significant relation is found between dune behaviour and potential sediment transport on yearly to decadal timescale. Due to transport limiting factors, wind forcing alone is not sufficient to explain the year-to-year variability in dune growth rates. Furthermore, dune erosion by storm events is in the same order of magnitude as dune growth by wind-blown processes. A strong negative correlation exists between dune erosion and maximum water level at the central part of the Belgian coastline, indicating high erosional sensitivity during storms.

Keywords: Aeolian sediment transport; Dune development; Belgian Coast; Decadal timescales; Water level