

Effects of shell content on bed mobility under mixed oscillatory and unidirectional flow conditions

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Problem definition

Methods

Future work

This is still work in progress. In the coming months we will continue processing and analysing the collected roughness, bedload, bed-composition, velocity and pressure data.

Shells can be found on most natural and artificial beaches. Yet they are often ignored in sediment transport models, simply because we do not know how (much) shell gravel affects sand transport under (mixed) unidirectional and oscillatory flow.

Research objective

Quantify shell armour layer development and bedload transport under various combinations of initial shell content and flow conditions. Under the project name TraSSh (**Tra**nsport of **S**and with **Sh**ells), flume experiments have been conducted at the NIOZ Yerseke racetrack-flume facility.

Results

Here we highlight some first results from the long-run experiments, showing the development of roughness and bedload transport rate over time.

Want to know more?

Attend the 11:30 am TraSSh talk by Tjitske Kooistra on the effect of different shell shapes on sand transport under unidirectional flow.





2.0 m

Side view of the test section with measuring equipment: Acoustic Doppler Velocimeter (ADV), ADV Profiler (ADVP), Pressure Sensor (PS) and GoPro Camera (GPC)



Roughness development during a wave-only experiment starting with 10 vol.% shell content







Bedload transport rates of sand (< 1 mm) under given current, waves and wave-current combinations in which the superimposed current is in the direction of wave propagation

Orthomosaics (top), DSMs (middle), DSM of difference (bottom) from a wave-only experiment starting with 10 vol.% shell content