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## An innovative way to track aeolian sediment transport patterns by using Argus video system.

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Coastal dunes are important for coastal safety. To maintain this natural means of coastal protection on the longer term, it is important to have predictive insight in the aeolian transport processes that naturally supply the dunes with sand from the beach. At present, such insights are insufficient. A first step forward is to better observe and quantify the actually occurring spatio-temporal variability in aeolian transport across beaches. In this study, we investigate how automatically collected video imagery can be used to track aeolian sediment transport patterns over a nourished beach surface.

The study site is the ‘Sand Motor’ mega nourishment (21 Mm<sup>3</sup> of sand) at the Dutch coast. An Argus video system, consisting of 8 cameras mounted on a 40 meter high tower in the middle of the Sand Motor, collects snapshot and time-exposure images every 30 minutes. These images show aeolian sediment transport patterns, such as streamers and aeolian bed forms (Figure 1a).

Preliminary results show that the movement of sand patches and aeolian bed forms can be tracked across consecutive images (Figure 1b). Not only can the images be used to obtain qualitative information – movement or not – but it also seems feasible to measure their migration speed and direction during aeolian transport events.

Gained knowledge about aeolian sediment transport patterns is expected to lead to improved insight in the contribution of intermittent aeolian processes to longer term sand supply towards the dunes. Next research steps will be to verify remote sensing results with ground truth data and to apply the methodology of tracking aeolian sediment transport patterns to several storms.

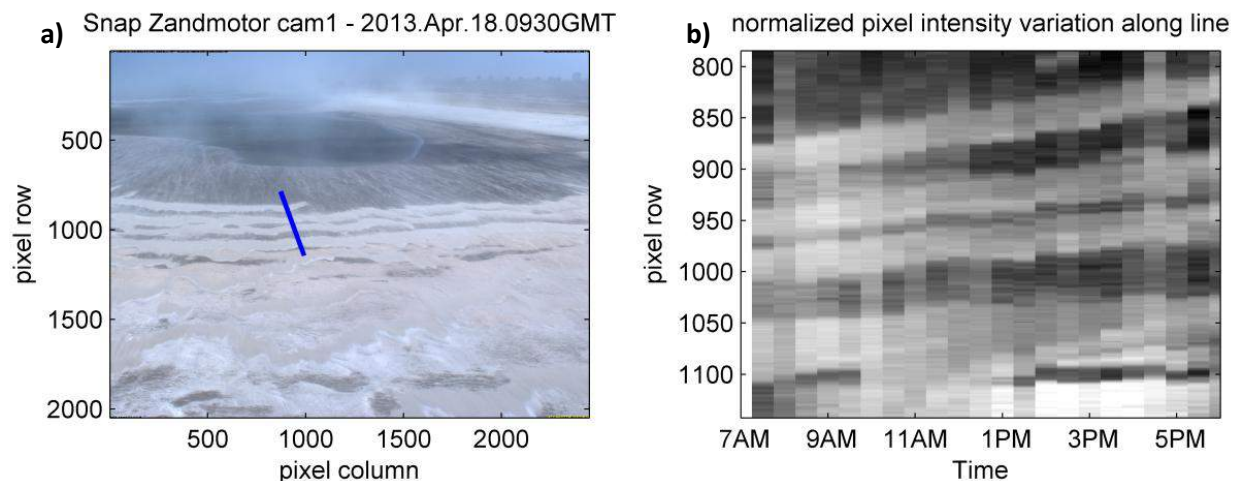


Figure 1. Tracking aeolian sediment transport patterns using video images. a) Snapshot image of Sand Motor. Blue line indicates pixel array over which the bedforms are tracked. b) pixel time stack showing (grayscale) pixel intensity in time over the pixel array. Light areas show dry sand bodies.