

# Photogrammetric Monitoring of a Dune Erosion Experiment

## The RealDune project.

Dutch coastal areas have always been attractive to live in. Half of the Dutch population and over two-thirds of the economic value is in coastal areas below mean sea level. Along a stretch of approximately 254 km, dunes act as the primary sea defence during storm surges. These dunes have to meet strong safety requirements laid up by the Dutch government. To assess these requirements, an accurate prediction of the amount of dune erosion is indispensable. To aid computational modeling approaches, a full-scale dune will be built and monitored on the Sand Engine near Kijkduin in November 2021. The experimental results will be compared with so-called XBeach model outcomes, after which this model can be improved if necessary.

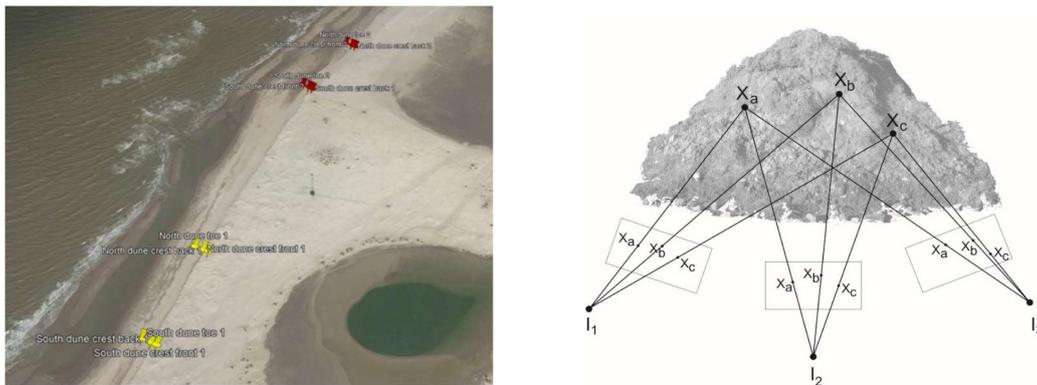


Figure 1. Left: location of the dune experiment on the Sand Engine. Right: photogrammetric procedure to estimate a 3D terrain model of a dune.

## Your thesis project.

To optimally profit from the artificial dune experiment, extensive monitoring of the expected erosion should be planned and executed. A challenge is that most erosion is expected during storm conditions, when monitoring is most difficult. In addition, it is on forehand unknown when these storm conditions will occur. Photogrammetry seems the most flexible technique to obtain instantaneous 3D terrain models of the dune at various stages during the experiment. It will be your task to (i), design and test a measurement setup during construction of the dune, (ii), obtain photogrammetric and additional 3D measurements during the experiment, and, (iii), assess the deformation during the experiment from your own measurement. Here it is preferred to use Open-Source photogrammetric software including novel Deep Learning methods for image matching. The project will be joined supervised by the Dept. of Geoscience and Remote Sensing and the Dept. of Hydraulic Engineering. **React fast, as the dune experiment will run in autumn 2021!**

## More information:

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