

Spatiotemporal levee erosion and wavefront velocity dataset from *in-situ* wave overtopping experiments

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Abstract

During extreme storm events, waves that run-up and overtop levees cause a significant hydraulic load on the landside slopes. In order to determine the effects of these loads on the flood risk, it is necessary to determine the sensitivity of the landside slope to erosion. Models exist for determining the erosion resistance of grass covers to wave overtopping. The challenge has been to qualitatively describe the erosion process due to wave overtopping and to quantify the erosion rate of clay exposed to wave overtopping loads. To address this challenge, prototype scale wave overtopping experiments have been performed. To facilitate the transfer of the results to other locations and clay types, the Erosion Function Apparatus has been used to predict the erosion characteristics from small samples collected from the test sites. Here we present a dataset containing measurements from four experimental campaigns designed to evaluate the erosion resistance of existing and newly constructed clay covers under controlled overtopping loads. It includes soil properties, hydraulic loading programs, overtopping characteristics, wavefront velocities, and erosion progression data. The dataset enables comparative analyses across levee types and provides a reproducible foundation for model calibration, erosion assessment, and flood defence design.

Keywords

Overtop levees, hydraulic load, landside slopes, wave overtopping, erosion.

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