



## Supplement of

## Estimating dune erosion at the regional scale using a meta-model based on neural networks

Panagiotis Athanasiou et al.

Correspondence to: Panagiotis Athanasiou (panos.athanasiou@deltares.nl)

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Figure S1: Copula-based events simulator for the Schiermonnikoog Noord station location (see Figure 2). Red, grey and black dots indicate observed, simulated and the 100 MDA selected events, respectively. The black dots are a subset of the grey dots (simulated events) that are selected with the MDA. Histograms of each storm parameter (*Hs, Tp, SSL* and *D*) for both observed and simulated events can be seen in the diagonal graphs. Below the diagonal, scatter-plots for each pair are plotted. Above the diagonal, 3 different dependency coefficients (p: Pearson correlation, t: Kendall's rank correlation, TDC: non-parametric tail dependence) are shown for each pair for the observed and simulated events.



Figure S2: Copula-based events simulator for the Eierlandse Gat station location (see Figure 2). Red, grey and black dots indicate observed, simulated and the 100 MDA selected events, respectively. The black dots are a subset of the grey dots (simulated events) that are selected with the MDA. Histograms of each storm parameter (*Hs, Tp, SSL* and *D*) for both observed and simulated events can be seen in the diagonal graphs. Below the diagonal, scatter-plots for each pair are plotted. Above the diagonal, 3 different dependency coefficients ( $\rho$ : Pearson correlation,  $\tau$ : Kendall's rank correlation, TDC: non-parametric tail dependence) are shown for each pair for the observed and simulated events.



Figure S3: Copula-based events simulator for the IJmuiden-06 station location (see Figure 2). Red, grey and black dots indicate observed, simulated and the 100 MDA selected events, respectively. The black dots are a subset of the grey dots (simulated events) that are selected with the MDA. The purple star indicates the boundary conditions during the 1953 storm. Histograms of each storm parameter (*Hs, Tp, SSL* and *D*) for both observed and simulated events can be seen in the diagonal graphs. Below the diagonal, scatter-plots for each pair are plotted. Above the diagonal, 3 different dependency coefficients ( $\rho$ : Pearson correlation,  $\tau$ : Kendall's rank correlation, TDC: non-parametric tail dependence) are shown for each pair for the observed and simulated events.