



Wind induced sediment resuspension events in shallow tidal basins

Andrea D'Alpaos (1), Luca Carniello (2), Andrea Rinaldo (2,3)

(1) Department of Geosciences, University of Padova, Padova, Italy (andrea.dalpaos@unipd.it), (2) Department of Civil, Environmental, and Architectural Engineering, University of Padova, Italy. , (3) Laboratory of Ecohydrology, ECHO/IEE/ENAC, EPFL, Lausanne, Switzerland.

The morphodynamic evolution of shallow tidal basins is crucially affected by wind-wave induced erosion processes. Both in the horizontal and in the vertical planes, wind waves promote erosion processes responsible for the equilibrium configuration and dynamics of tidal-flat surfaces and salt-marsh boundaries.

Towards the goal of setting up a theoretical framework which can be used to model wind-wave effects on tidal morphodynamics in a predictive manner, we have used a wind-wave tidal model, forced with observed tidal levels, wind intensities and directions, to analyse the temporal evolution of combined current- and wind-induced exceedances in bottom shear stress over a critical threshold for erosion.

Our analyses show that wind-induced resuspensions can be modelled as marked Poisson process, with important consequences for quantitative description of the long-term morphodynamic evolution of tidal landscapes.