Multidimensional Hydrodynamic Framework for Modeling Compound Inundation in Coastal Watersheds

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March 21, 2024

Abstract

We developed a coupled overland and river model for modeling compound flooding using the kinematic wave approximation on inland sections of an unstructured mesh, and the diffusive wave approximation on riverine sections. A finite element method is used for spatial discretization and a Crank-Nicolson scheme is used for time discretization. A wetting and drying algorithm is implemented for improved efficiency in the model. Pluvial conditions and tidal conditions are implemented as source terms in the river model. The results show that effects from compound inundation could be captured using this framework.

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Syst. Sci. Discuss 1–30.

Wooding, R. A., 1965. A hydraulic model for the catchment-stream problem. In Journal of Hydrology (Vol. 3, Issues 3–4, pp. 254–267). Elsevier BV.

