

# A framework to connect the flood and evacuation process: opening up their interface for development on evacuation models, decisions and strategies

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## Abstract

The possibility to evacuate when a flood approaches depends on the available time, routes, traffic flood capacities. The decision whether to evacuate is based on the perception on the upcoming situation, is the expected flood depth enough reason to leave. In a situation where a dam breach is the cause of a flood, the propagation can be calculated from the moment the levee fails. And therewith an estimation on who will be flooded can be done. However, flood modeling and evacuation modeling are mostly viewed from two different scholars. Therefor analysis, simulation, estimation on behaviours, effective measures are not approached on a flood-evacuation integrated level. There is no foundation in how these two processes interact during a flood. In this research we explore on what node the flood process and evacuation process could be tied together. We assemble from literature the variables in the evacuation process which are depended on the flood propagation. We created a 2D flood simulation model for the city of Den Helder in The Netherlands, by which we simulate for two different breach times the resulting flood propagation. We use this model output to analyse the effect on the defined variables towards the evacuation process, the flood impact on houses, roads and network level. The result shows that variation in flood propagation as a result of two different breach times, have differences is the input for the evacuation decision, on a individual level, for different areas and on the network level. The contribution of the research is a framework which connects the flood and evacuation process. This gives the opportunity to analyse dependencies, and develop methods to access effective measures.

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