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Agent based models for testing city evacuation strategies under a flood event as strategy to reduce flood risk

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This research explores the uses of Agent Based Models (ABM) and its potential to test large scale evacuation strategies in coastal cities at risk from flood events due to extreme hydro-meteorological events with the final purpose of disaster risk reduction by decreasing human's exposure to the hazard. The first part of the paper corresponds to the theory used to build the models such as: Complex adaptive systems (CAS) and the principles and uses of ABM in this field. The first section outlines the pros and cons of using AMB to test city evacuation strategies at medium and large scale. The second part of the paper focuses on the central theory used to build the ABM, specifically the psychological and behavioral model as well as the framework used in this research, specifically the PECS reference model is cover in this section. The last part of this section covers the main attributes or characteristics of human beings used to described the agents. The third part of the paper shows the methodology used to build and implement the ABM model using Repast-Symphony as an open source agent-based modelling and simulation platform. The preliminary results for the first implementation in a region of the island of Sint-Maarten a Dutch Caribbean island are presented and discussed in the fourth section of paper. The results obtained so far, are promising for a further development of the model and its implementation and testing in a full scale city