



## **Assessing potential effects of climate change on inundation patterns with a meta-model-based approach**

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Climate change has had widespread impacts on human and natural systems. Inundation caused by heavy rainfall usually leads to loss of human life and properties. Hence, assessing climate change effects on inundation patterns is a critical issue, especially for decision support systems. In this study, a novel meta-model-based approach is proposed to evaluate future inundation patterns on climate change. First, inundation depths, which are simulated and validated by a physically based two-dimensional model, are used as inundation database. Second, the meta-model is established on the simulations of the physical-based model through the training of a support vector machine (SVM), which is one of the remarkable machine learning techniques. A weather generator is then applied to downscale the output of general circulation models (GCMs) under RCP scenarios during different time periods. In addition, an application of a catchment in Taiwan is conducted. The results show that the inundation patterns in the climate scenarios can be reasonably evaluated in the future. The proposed approach is expected to be useful for assessing potential effects of climate change on inundation patterns.