



## **Multi-Hydro modelling to assess flood resilience across scales, case study in the Paris region**

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### **ABSTRACT**

Nowadays there already exists a large variety of hydrologic modelling tools. However in the context of a climate change, the management of urban areas requires an even deeper understanding of the multi-scale dynamics and complex interactions between the processes of urban water cycle. This paper discusses some new results obtained during the European project SMARTesT that promotes Smart Resilient Technology, System and Tools to help stakeholders in improving the resilience of their cities to floods.

In this way, Multi-Hydro has been developed at Ecole des Ponts ParisTech (El-Tabach et al., 2009; Giangola-Murzyn et al., 2011). This multi-module physically based model estimates for a given rainfall scenario, possibly downscaled to very high resolutions, the space-time distributions of surface water, in particular by taking into account small-scale changes in the land use. This model is based on an interactive coupling of several modules that simulate the main hydrologic and hydraulic processes. The core of Multi-Hydro manages the feedbacks from one modelling component to others. Multi-Hydro was tested on a case study in Val-de-Marne county (south-east part of Paris region, France).

### **KEYWORDS**

Fully distributed model, GIS data, hydrological modelling, hydrological-hydraulic modelling, multifractal analysis