Geophysical Research Abstracts
Vol. 15, EGU2013-13111, 2013
EGU General Assembly 2013

A Multi-Hydro simulation for evaluation of the impacts of flood management at Heywood, RU.

Agathe Giangola-Murzyn (1), Julien Richard (1), Karl Hennermann (2), Auguste Gires (1), Ioulia Tchiguirinskaia (1), and Daniel Schertzer (1)

(1) LEESU - Ecole des Ponts ParisTech, Champs-sur-Marne, France (giangola@leesu.enpc.fr), (2) School of Environment and Development, University of Manchester

The flooding problems in urban and peri-urban areas have more and more important impacts on city life. Indeed, with the expansion of the latter, the floodplains are more intensively used and floods will generate significant damage very expensive. In the aim to reduce these costs and facilitate a return to normal faster after the flood, the FP7 SMARTeST project aims to provide users of these areas a guide to help them choose the most appropriate protection measures.
It is in this context that the Multi-Hydro model has been developed and improved in the Ecole des Ponts ParisTech. This model consists into a coupling between four modules (relying on existing open source and widely validated physically based model): one for the rainfall scenario generation, one for the surface processes, one for the subsurface processes and one for the load of the sewer system. This structure of coupling allows to represent all the parts of the water's path from the surface to the sewer system's pipes and to the soil of the considered catchment and it allows to disconnect one element of the coupling system if it's necessary. Moreover, this model uses some GIS data as the elevation, the land use, the soil description and the sewer system description which can be managed by a dedicated open source SIG allowing to use directly the data in the model.
The Multi-Hydro model has been used on a street of Heywood, Rochdale, Greater Manchester urban area. This residential street has known some important events during this last 10 years. Thus, Multi-Hydro has been used to evaluate the effects of the implementation of protection measures supposed to reduce the damages of the flood: a storage basin, located between Wilton Grove and the Egerton street and two barriers across the streets.
For a given event, NIMROD radar data have been used to reproduce the flood. Then, the protective measures were put in place virtually. Analysis of water height maps obtained with Multi-Hydro allowed better understand and better assess the hydrological behavior of étidié neighborhood. Thus, the early assumptions about the location of the barriers have proved misguided. The results and the multiplication of the protection scenarios could thus permit to improve protection strategy in the studied streets.