



Flash flood simulations using hydroinformatics modeling system for El Gouna, Egypt

Ester Marafini (1), Franziska Tügel (2), Ilhan Özgen (2), Reinhard Hinkelmann (2), and Michele La Rocca (1)

(1) Department of Engineering, Università degli studi Roma Tre, Rome, Italy, (2) Chair of Water Resources Management and Modeling of Hydrosystems, Technische Universität Berlin, Germany

Due to their random occurrence flash floods often lead to consistent urban damages, especially for ungauged cities in the Sahara Desert, characterized by wadi system. As a matter of facts, a wadi is a dry riverbed which can discharge large water of volumes after heavy rainfall. Thus, simulating flash flood events is very useful to find out possible protection measures able to mitigate negative effects for cities located in wadis. In this work, the event of 9th March 2014 has been simulated in both space and time evolution for the city El Gouna in Egypt, using a 2D shallow water model, by means of a powerful tool: hms (hydroinformatics modeling system). hms is a software developed at the Chair of Water Resources Management and Modeling of Hydrosystems of the Technische Universität Berlin, based on the finite volume method. The flow field around the urban area of the city has been investigated adopting different protection measures able to minimize the risk of flooding. In particular, two different scenarios have been analysed: the first one providing a large storage basin and a dam, the second one using a large storage basin and two little ones where natural depressions are located. Both scenarios have been discussed in term of water depth and the second one was found to represent the best solution to the problem.