



Storm risk assesment in Parma city sewer systems

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Owing to two rivers branching in town, the city of Parma (Northern Italy, 170.000 inhabitants) has 3 independent sewer systems. Their catchment basins have experienced significant land use changes during the last 50 years, in terms of reduction of agricultural areas transformed into urban ones; the same trend is regarded as highly probable in the next two decades.

The performance of the systems is not satisfactory even at present: some minor floodings already occur with 2-3 years return period, while the damage rapidly increases with 5-10 years RP hydrological events. The risks are likely to increase with the future urbanization of the suburban zones.

The paper describes the application of hydrological and hydraulic modelling in order to assess:

1. the 2005 risks related to storm events,
2. the risk increase at 2025 scenarios,
3. the guidelines for the management of that risk, by modifying the structure of the network as little as possible, due to many hystorical and practical constraints.

The calibration procedure is focussed on. Only rainfall data are available: flow measurements are totally lacking. Moreover the data about the structure of the systems are not completely reliable. The simulation results are compared with the hystorical map of the system failures (location, frequency, magnitude): where discrepancies arise, in situ campaigns are organized aiming at explaining the differences and at improving the numerical representation of the physical problem.

The water quality topic is not dealt with, apart from the analyses of the impact that future regional guidelines on the disposal of first 5 mm of rain at every event, would entail over the entire urban area.