



Modelling of E. coli distribution in coastal areas subjected to combined sewer overflows

Mauro De Marchis¹, Gabriele Freni², Enrico Napoli³

¹ University of Enna “Kore”, Italy, mauro.demarchis@unikore.it

² University of Enna “Kore”, Italy, gabriele.freni@unikore.it

³ University of Palermo, Italy, enrico.napoli@unipa.it

ABSTRACT

Rivers, lakes and the sea were the natural receiver of raw urban waste and storm waters for a long time in the human history but the scarce sustainability of such practice, the increase of population and a renewed environmental preservation approach increased researcher interest in the analysis and mitigation of the impact of urban waters on receiving water bodies. In Europe, modelling has been promoted as a promising approach for implementing the Water Framework Directive (WFD). A particular interest is given to the fate of Pathogens, and especially of E. coli, in all the cases in which an interaction between population and the RWB is foreseen. The present paper aims to propose an integrated water quality model involving the analysis of several sewer systems discharging their polluting loads near the coast in a sensitive marine environment. From a modelling point of view, the proposed application integrated 1D sewer models with a complex 3D model analysing the propagation in space and time of E. coli in the coastal marine area. The integrated approach was tested in a real case study (the Acicastello bay in Italy) where data were available both for SS model and for Receiving Water Body (RWB) propagation model calibration. The analysis shows a good agreement between the model and monitored data. The 3D RWB model is a valuable tool for investigating the pollutant propagation and to highlight the most impacted areas.

KEYWORDS

Integrated urban drainage modelling, receiving water bodies, E.coli