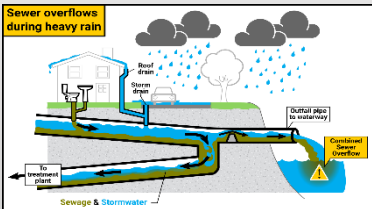


CITIZENS AND LOCAL AUTHORITY WORKING TOGETHER FOR A SUSTAINABLE MANAGEMENT OF THEIR TERRITORY

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INTRODUCTION. One of the very common problems affecting freshwater is sewer **spillways**. To prevent breakages and spill of the sewer system a large number of spillways are made, which work during high rainfall. However the effectiveness of dilution is due to stream discharge as well, so when it is very low the quality of spilled water could be not good enough.



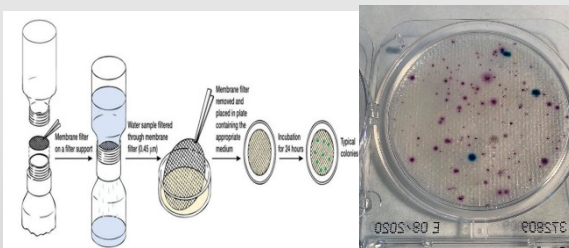
Study area: S. Lazzaro di S. Bologna

44,70 km², 33,000 inhabitants. Three main rivers, with extremely variable discharge, cross this territory: the Savena, Idice and Zena river.

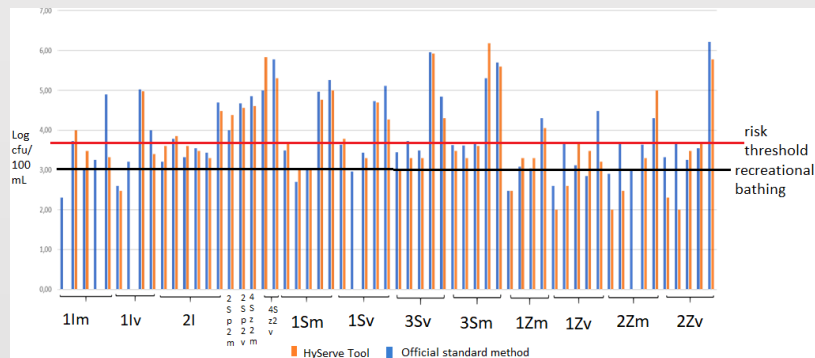
AIM: Developed a partnership among the community, the Municipality and scientists in order to analyze the impact of sewer spillways on freshwater by bacteriological analyses and FWW method, we assess the reliability of a CS methods for bacteriological analyses as well.

Official standard method

HyServe tool



METHOD. For bacteriological analysis, parallel analysis were performed on the same sample using both the proposed CS kit (Compact Dry EC Plates from HyServe) for Citizens and scientific method based on membrane filter technique followed by incubation and enumeration using a Chromogenic Coliform Agar selective and differential medium for the simultaneous enumeration of E. coli and coliform bacteria in waters, according to ISO 9308-1:2017. Nitrate and phosphate analyzes were also carried out with the FWW method.



RESULTS. From the comparison of the **E. coli values** obtained with the standard method (blu) and with the CS kit (red), it turns out that the two methods have correlated and comparable results confirmed by the statistical analysis ($p = 0.00001$, $R^2 = 0.57$). The HyServe plate seems to make more precise measurements for high concentrations of E. coli and less for low ones since in 5 cases it did not detect despite these having been found with the cultivation method. The value of 3 Log cfu/100ml (1000cfu/100ml) corresponds to what is reported in the literature as a limit value for recreational bathing in inland waters established by national Legislative Decree 116/2008. While the value of 5,000 cfu/100ml indicates a risk threshold.

CONCLUSIONS. 1 - clear impact of spillways on the concentration of bacteria in freshwater. 2 - The HyServe plate was found to be reliable for E. coli measurements but not for fecal coliforms, it also presented some difficulties in its use by citizens. 3 - The high microbiological pollution is not correlated with the values of P-PO₄ and N-NO₃.