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Groundwater pollution by antibiotic-resistant strains released in surface waters

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The spread of antibiotic resistant bacteria (ARB) in environmental systems could lead to significant health concerns. A coastal aquifer in southern Italy (Villanova, Ostuni) was analysed in this study in order to quantify groundwater pollution by ARB released in surface waters. During the time period September 2009 to July 2010, twenty-four samples were collected from surface and ground waters of the study area. Each sample was analyzed for microbiological/chemical quality and for ARB. Some strains of E. coli and Salmonella were tested for susceptibility to 17 antibiotics. Mathematical models were employed in order to simulate pathogens and ARB migration in groundwater. The experimental results suggested that surface waters were more contaminated than groundwater, whereas groundwater quality is highly variable depending on the sampling period as well as the distance from the seacoast.