

## **Bathing water management in Costa do Estoril, west of Lisbon: control of diffuse fecal pollution and implementation of an early warning system**

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**ABSTRACT:** Lagrangian models are the most suitable for studying the dispersion of small plumes as is usually the case for bathing water contamination sources, solving the numerical difficulties associated to the study of bathing waters. This work describes a methodology for classifying the quality of a bathing water based on the results of a lagrangian model using two criteria: (i) the presence of contamination patches in the bathing water area and (ii) the probability of a bather to be in contact with it.

The proposed methodology is tested in Santo Amaro de Oeiras and Torre bathing waters in Costa do Estoril, in winter when the local stream discharges are too high for being intercepted before hitting the beaches. These beaches were chosen for being localised in a region with a complex tidal flow pattern, with eddies and strong velocities.

A method for quantifying the contribution of each pollution source for the pollution identified in the bathing water is also presented, contributing for (i) the preparation of the bathing water profile, (ii) the design of a preventive monitoring system and (iii) for implementing a warning system as foreseen in the Directive 2006/7/CE.

Keywords: Bathing Waters, Bathing Water Profile, Urban Streams, Short Term Pollution Events, Lagrangian Mathematical Modelling.