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## **MODELLING TOOLS TO SUPPORT AN EARLY ALERT SYSTEM FOR BATHING WATER QUALITY**

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### **Abstract**

A new approach on bathing water quality management was given by the New Bathing Water Directive (NBWD), enforcing the implementation of alert and prediction systems in order to avoid bathers exposure to short-term pollution events. This paper focus the study of Portuguese bathing waters located in Estoril Coast, that can be exposed to short term pollution events due to local stream discharges mainly after raining events. An operational model was implemented, using automatic hydrometric stations on streams, monitoring results (streams and coastal waters), and modelling tools (MOHIDWater), to forecast bathing water quality. This model uses a Lagrangian approach to forecast bathing water quality following 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 the contaminated water. This methodology was tested during the 2011 bathing season (May to September), and showed the ability to to predict in time the contamination events identified those bathing waters. The methodology proposed, using a Lagrangian monitor box approach, is able to: i) forecast the risk of having faecal contamination on bathing waters; ii) forecast faecal contamination values, and iii) identify the main pollution sources.

This integrated forecast model is a tool that can be used by local management authorities to answer to NBWD requirements, namely to forecast the bad water quality events and avoid bathers exposure to faecal contaminated waters.

*Key words:* Alert system, Bathing water quality, forecast, modelling

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