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## Stochastic optimization for a problem of saltwater intrusion in coastal aquifers with heterogeneous hydraulic conductivity <sup>1</sup>

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### Abstract

In the present study we implement the stochastic optimization technique ALOPEX, in order to control the problem of saltwater intrusion in coastal aquifers. The objective is to maximize the total volume of freshwater pumped by the wells of the aquifer, while protecting the aquifer from salt water intrusion. Extending previous results, we examine some cases of non-homogeneous aquifers, divided in rectangular areas with different values for the hydraulic conductivity parameter. At the same time, appropriate penalties strategies are used to produce different management policies. Numerical experimentation with several test cases of non-homogeneous aquifers and two real case coastal aquifers (Vathi and Hersonissos aquifers in Greece) are presented.

*Key words:* ALOPEX stochastic optimization, non-homogeneous coastal aquifers, saltwater intrusion, pumping management, hydraulic conductivity

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