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## 259 - RE-ASSESSING COASTAL GROUNDWATER MANAGEMENT POLICY IN THE ALGARVE: ESTIMATING THE POTENTIAL FOR SEAWATER INTRUSION

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Groundwater supplies about 70% of the fresh water needs in Portugal with most of the aquifers occurring at the coastline, where more than 60% of the whole population dwells. The overexploitation of groundwater resources during the final decades of the 20<sup>th</sup> century, lead to a gradual decrease in water quality in many coastal aquifers of the Algarve, the southernmost region of Portugal. This led the local water authority to prohibit the drilling of new boreholes along the coastal strip. However, with the change to a surface water based public supply in the region, groundwater levels have stabilized and water quality has improved. The current regulatory agency (the Portuguese Environment Agency - APA) is under growing pressure from end users to emit groundwater use permits within this area. To deal with this issue, the Algarve regional branch of APA is developing a Specific Water Management Plan (SWMP) for the coastal strip within the scope of the European Water Framework Directive. However, the currently available data on seawater intrusion (SWI) and the effects of predicted changes in groundwater use, climate and sea level in the region is still scarce.

Numerical models of several main aquifer system of the region have been developed to assess the potential for SWI. Several scenarios of increasing groundwater abstraction, decreasing recharge and sea-level rise are applied. During an initial phase, simple flow models are applied together with sharp-interface analytical models to assess the extent of intrusion of the fresh/saltwater interface. This represents an initial phase in the development of variable density flow and transport models for the selected aquifer systems.

The combined investigation of model results permits the regional scale analysis of the potential for seawater intrusion in the Algarve. Initial results have identified areas where increased abstraction is least likely to cause significant risks, and where the current 1 km extent for the prohibition of new boreholes could be relaxed. On the other hand, several areas were identified which are under risk of further seawater intrusion.