

New data on seawater intrusion into the Llobregat delta aquifer, Barcelona, Spain

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ABSTRACT

The Llobregat delta aquifers are key elements for the water supply to the Barcelona's Metropolitan Area, Catalonia, Spain, that has been discussed elsewhere and in different SWIM meetings. Groundwater exploitation is mostly from a deep confined aquifer of late Pleistocene age, covered by Holocene sediments deposited after the Mediterranean sea level was raised up to current position. This aquifer is open to the sea bottom about 4 km offshore. Consequently the important piezometric level lowering due to intense aquifer development has produced a serious seawater intrusion, mostly in the southeastern sectors, with important problems for urban and industrial supply, as well as for farming. Effort to reduce, stop and to redress seawater intrusion has been and carried out through improved groundwater management, increased aquifer recharge in the lower valley, and now through an injection well barrier using highly treated reclaimed waste water, including reverse osmosis. Some new data has been added to better understand how the aquifers behave and are recharged, including hydrogeochemical and environmental isotope techniques, which are the main subject of the paper, with additional comments on how the geothermal disturbances help in the groundwater flow understanding and in the identification of some processes, such as well salinity characteristics.