

The piezometric stress in the coastal aquifers of a karstic region, Apulia, Italy

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Abstract Apulian groundwater is extremely important for the development of local communities, given the extreme scarcity of surface water that is typical for a widespread karstic region. Valuable groundwater from large carbonate coastal aquifers is discharged at increasing rates for domestic, irrigation, and industrial uses. The increase has been particularly relevant during the many recent drought periods, due to paradoxical management. The trend of piezometric head and spring discharge highlights a dramatic decrease in groundwater availability since the 1920s. The remarkable lowering defines a widespread degradation of high quality groundwater resources in each aquifer considered. The lasting “memory effect” shown by each aquifer can reduce and delay, but cannot completely remove the negative effects of long drought periods and increasing well discharge. These effects are more relevant in some inner portions of aquifers. The piezometric lowering in the Salento Peninsula is slow but especially problematic due to the naturally low piezometric head above sea level, which permits seawater intrusion. Salt quality degradation of the Apulian groundwater, due to effects of seawater intrusion, is feared. The decreasing trend of the piezometric head thus defines not only a decrease in groundwater availability, but also a risk of quality degradation.

Key words groundwater depletion; coastal aquifer; hydrological time series