Hydrochemical characteristics and processes for salinity sources of the shallow groundwater along the coast of northern Jiangsu, China

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Abstract: In order to find out the hydrochemistry and salinization of shallow groundwater in coastal aquifers, 76 ground- and surface-water samples, contained phreatic upper water, phreatic water, confined water, river water and seawater were collected for major ion and isotope analysis (\(^2\)H/\(^18\)O, \(^14\)C). The results show that: (1) The phreatic upper groundwater changes along the general flowpath towards the coast from fresh (TDS <1 g/L), brackish (1–3 g/L) to saline (3–50 g/L). The phreatic water and first confined water are basically unchanged, but mainly saline water. (2) Shallow groundwater is mainly derived from atmospheric precipitation and undergoes significant evaporation processes. The phreatic upper groundwater is mainly derived from modern atmospheric precipitation recharge. The phreatic water and first confined water are mainly derived from precipitation replenishment during the warm period of the Holocene and some relict seawater. (3) The processes for salinity sources of the shallow groundwater are that oceanic evaporative salt formed during the transgression and retreat period since the late Pleistocene was dissolved by atmospheric precipitation and river water for many periods. The salt in phreatic upper water of the estuary area is also derived from modern seawater intrusion.

Key words: coastal zone; groundwater; hydrochemistry; hydrogen and oxygen stable isotope; salinization

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