

The study area is located in the Southern part of the coastal sedimentary basin of Benin. This basin contains four aquifers among which the aquifers of the Quaternary and of the Continental Terminal which are concerned by the present study. These aquifers are intensely used for the drinking water supply of about two million inhabitants in the cities of Cotonou, Porto Novo, Ouidah and their surroundings. At present, a degradation of the quality of groundwaters coming from the aquifers of the Quaternary and of Continental Terminal is observed that is connected to ground occupation and to the intensive pumping, having for consequence the progression of the marine intrusion in these aquifers. The present work aims at studying the hydrogeochemical and isotopic behaviour of these two aquifers. The methodological approach consists in the measurements of the physico-chemical parameters, as well as the stable isotope signature of the groundwater in order to appreciate groundwater quality and origin. Results show that groundwaters of the aquifers of the Quaternary and of the Continental Terminal are highly mineralized and show Na-Cl or Ca-HCO₃ water types. The main processes affecting the mineralization of waters are, among others, the mixture with salty and brackish waters from the Atlantic Ocean or from the littoral lagoons, dissolution of carbonate minerals and cationic exchanges. The isotopic study indicates that groundwater is recharged by local rainfalls; some samples of the Quaternary aquifer show a mixture with the sea water, which is in good agreement with the geochemical results. Both aquifers tend to show the same isotopic signature suggesting a relatively good hydraulic continuity within the reservoir and confirming geological investigations made through drillings.