

ORIGINS OF THE FLOWS IN A TROPICAL BEDROCK BASIN IN BENIN (DONGA, UPSTREAM OF OUEME RIVER)

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To the western center of Benin, under soudanian climate, one of the objectives of the AMMA Project is to better forcing the estimation of the surface water budget of the upper Oueme catchment. Key processes studies are undertaken on a sub-catchment (Donga catchment, 586 km²).

In order to determine groundwater flux directions, a differential GPS levelling and dense hydrodynamic steady were carried out. The results showed that the groundwater was potentially drained by the hydrographic network. Piezometric observations realised on a local scale (hillslope of the Ara catchment (13 km²), a sub-catchment of the Donga watershed) indicated the presence of a perennial groundwater surmounted by transitory flows which disappear during dry season.

To estimate the contribution of the groundwater to the Donga streamflow, a steady of various tracers (major elements and traces) was initiated in 2003. The dissolved elements content in groundwater was 3 to 5 times higher than the stream baseflow. This suggested a dominating contribution to the surface flow of hypodermic flows at low time of residence in agreement with the hydrodynamic observations. This diagram was repeated during the following year (2004) with a relatively lower pluviometry. This phenomenon showed a stable contribution of reservoirs on an interannual scale. Concerning flood, a standard type fluctuation emerged: an abrupt fall of the contents culminating with the flood's peak, a progressive recovering of the initial value of the baseflow succeeded. The constant ionic relationship between various tracers of deterioration (Ca and Si) indicated a variable contribution of the unique reservoir of sub-surface.

Key words : flow, groundwater, flood, water geochemistry, hydrograph separation

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Convective wind system with aerosols, named "haboob", Hombori in Mali, West Africa.