Introduction

- Northern Rio de Janeiro State: increasing use of groundwater as an alternative source
- Availability studies are scarce but have a high demand.
- The influence of climate variations to aquifer recharge is a key issue and assessment of aquifer behavior with climate change scenarios: invaluable information for planning purposes.

Methodology

- Objective: Use climate data (P, T) to estimate recharge using Thornthwaite-Mather (1955) method;
- Application of Groundwater mass balance simulations and extreme climate indices analysis (RClimDex software Meteorological Service of Canada) in the northern region of Rio de Janeiro state – Brazil.

Results

- Monthly average rainfall data series with total P (PRCPTOT) and average T (TP2M) simulated byEta-HadGEM2-ES model for the present (1961-1990) and future climate (2011-2100) with RCP4.5 and RCP8.5 scenarios (IPCC, 2013), over 108 grid points in the Fluvio-deltaic aquifer area.
- Recharge estimation through a Hydrometeorological Balance using temperature and precipitation data obtained from the meteorological station of the Brazilian Institute of Meteorology (INMET) from 1961-2016 period with software Easybal 4.0 (Vazquez-Suñé and Castro, 2002).

- Average annual precipitation: 958.2 mm; average annual recharge: 232.32 mm \(\rightarrow\) 22% recharge.
- High correlation (0.93) between recharge and precipitation: precipitation variations are directly related to the variations of aquifer recharge.

Conclusions

- Results indicate an increase trend in temperature and a decrease in rainfall in the study area, which is becoming hotter and dryer through time. As rainfall and recharge trends are strong related, it is possible to conclude that a decrease in rainfall leads to a decrease in the recharge. This process is certainly accelerated by climate change and affect the water availability in the aquifer, reducing its water potential.

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References