

Analysis of groundwater movements in the coastal watershed in southern China: a case study at the Zhuhai campus of Sun Yat-sen University

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Abstract Groundwater discharge flux to the sea plays an important role in the environmental change of the coastal zone, but little research has been done on the relationships among groundwater, surface water and sea water in the Pearl River Delta area in southern China. This paper establishes a three-dimensional groundwater flow model focused on the Zhuhai campus of Sun Yat-sen University with the software FEFLOW, using observation data of the water table from 17 wells located inside the campus, observed rainfall and evaporation data, and analysed hydrogeological coefficients. Our results show that the discharge flux through the 1100 m × 22 m model boundary to the sea between 4 August 2006 and 17 February 2007 was about 25 000 m³. The coefficient of evaporation of the groundwater (actual evapotranspiration from phreatic aquifer/potential evaporation) and the coefficient of recharge by rainfall infiltration (the percentage of precipitation that infiltrates into phreatic aquifer) in the watershed are 0.26 and 0.21, respectively.

Key words FEFLOW; groundwater discharge flux to the sea; evaporation from groundwater; coefficient of recharge by rainfall infiltration; Zhuhai