



Effect of Zero-flow in the Lower Yellow River on Groundwater Formation and Usage in Bank Areas

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Frequent zero-flow problem has a serious influence on the eco-environment system of the area along the Lower Yellow River. The authors studied the impact on lateral seepage quantity and groundwater cycling caused by zero-flow problem of the Yellow River, compared the seepage quantity with that of the year 1999 through the numerical simulation model of groundwater flow system in the affected zone. The lateral seepage quantity decreased 53.8% on zero-flow section from Huayankou to the river entrance and the related lasting duration is 300 days. The lateral seepage quantity will decrease 46.3% if zero-flow section is from Jiahetan to the river entrance and the lasting duration is 300 days, and it will decrease 75.2% if zero-flow problem occurs throughout the year. The lateral seepage quantity will decrease 19.8% if zero-flow section is from Luokou to the river entrance and the related lasting duration is 300 days, and it will decrease 25.1% if zero-flow problem occurs throughout the year. The lateral seepage quantity will decrease 4.7% if the zero-flow section is from Lijin to the river entrance and duration is throughout the year. Zero-flow of the Yellow River has a minor influence on the shape of groundwater flow domain of the affected zone. Thus, the boundary condition of the shallow groundwater system will not change. Although zero-flow problem has a major influence on the riverside source fields in the Lower Yellow River, it will not have a significant influence on groundwater resources macroscopically in the affected zone of the Yellow River.