**Seasonal pattern of zooplankton communities and the effect of hydraulic regulation on zooplankton biomass in the regulating lake of the South-to-North Water Diversion Project**

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Hydraulic regulation has a great meaning for water quality improvement. However, its effect on the ecosystem, as ecological function and diversity, is complicated and many-sided. Drawn by the need to promote the high-quality development of the follow-up project of the South-to-North Water Diversion Project (SNWDP), this study aims to investigate the impact of hydraulic regulation on ecological processes, especially on zooplankton, in a shallow Nansi Lake, one of the regulating lakes of the East Route of SNWDP. The seasonal pattern and diversity of zooplankton communities were analyzed between the water transfer and non-transfer period. The redundancy analysis indicated that clear-water diversion intensified the direct intervention of nutrients and dissolved oxygen on the growth of zooplankton such as Copepoda and Cladocera. A one-dimensional ecosystem model was established to assess the zooplankton biomass response to hydraulic regulation, based on the observed data of Nansi Lake. The modeled results showed that total nitrogen and phosphorus concentrations decreased with the clear-water diversion in the Nansi Lake, which further increased the peak biomass and shortened the growth cycle of zooplankton. Especially in wet years, the clear-water diversion greatly improved the water quality and inhibited the occurrence of algal blooms in the water transfer period. For the water non-transfer period, it showed that the improvement in water quality induced a significant decline in zooplankton biomass after the end of diversion, due to grazing food constraints. Our study provides important implications in the terms of improving water ecology through hydraulic regulation and advancing the aquatic ecosystem model of zooplankton application.