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河口前置库系统在滆湖富营养化控制中的应用研究

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Application of Estuary Pre-Dam to Eutrophication Control in Gehu Lake

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摘要 通过对建立在滆湖西北部夏溪河和扁担河汇合进入滆湖湖口处的前置库系统进行研究，结果表明前置库系统对入湖河流中氮、磷和藻类的去除作用明显。在稳定期内，可将劣Ⅴ类进水水质提高至Ⅲ~Ⅳ类，ρ（TN）和ρ（TP）也分别由1.21~3.09和0.05~0.24 mg•L^{-1}降至0.62~1.26和0.03~0.09 mg•L^{-1}，平均去除率均约为60%；对藻类，ρ（Chl-a）则由15.10~126.07降至4.32~42.95 mg•m^{-3}，平均去除率为（67.55±3.06）%，最高可达82.82%。此外，在前置库系统的不同区内，调蓄缓冲区对TN、TP和Chl-a的去除作用均比较明显，与其他区之间差异显著（P<0.05）；在同一区内，对于不同水质指标，仅有生态稳定区对Chl-a的去除作用明显，且与对TN、TP的去除作用之间存在显著差异（P<0.05）。

关键词： 前置库 入湖河流 富营养化 滆湖

Abstract： Effects of the pre-dam system built in the northwest of the Gehu Lake, where the Xiaxi River and the Biandan River merged and flowed into the lake, were investigated. Results show that the effects of the system were significant on removing of N, P and algae from inflow rivers. During the stable period, the pre-dam system raised the quality of the inflow water from Gategory $\mathrm{V}_{\mathrm{minus}}$ to Gategory Ⅲ-Ⅳ, and reduced the concentrations of TN (total nitrogen) and TP (total phosphorus) from 1.21-3.09 and 0.05-0.24 mg•L^{-1} to 0.62-1.26 and 0.03-0.09 mg•L^{-1}, respectively, with average TN and TP removal rates being around 60%. For algae, the concentration of Chl-a (chlorophyll-a) was lowered from 15.10-126.07 to 14.32-42.95 mg•m^{-3}, with average removal rate being (67.55±3.06)%, and maximum removal rate reaching 82.82%. Besides, within the system, the effects of the storage buffer zone removing TN, TP and Chl-a were more obvious than those of the other zones (P<0.05). In the same zone inconsistent in water quality index, only the ecological stable sub-zone had an obvious effect on controlling Chl-a, and differed significantly from the other sub-zones in TN and TP removing effect(P<0.05) .

Keywords： pre-dam inflow river eutrophication Gehu Lake

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