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1980—2010年温榆河的水环境质量时空演变特征

Spatio-temporal evolution of water environment quality in Wenyu River during 1980—2010

关键词: [水环境质量](#) [时空演变特征](#) [温榆河](#) [非常规水源](#)

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摘要: 以温榆河流域的主要超标污染物COD和氨氮为研究对象,通过历史数据和现场调查,系统研究了1980—2010年间温榆河的水环境质量时空演变特征.结果表明,温榆河流域水环境质量经历了清洁-污染-重度污染-污染遏制的过程,但水质现状均不达标;温榆河流域水环境质量好坏依次是上段>下段,温榆河>坝河>清河,并且Pearson相关分析表明,温榆河下段COD和 $\text{NH}_4^+\text{-N}$ 浓度主要受清河影响;温榆河流域COD污染逐步遏制(超标倍数<1)、 $\text{NH}_4^+\text{-N}$ 污染凸显(超标倍数8~20),耗氧物质处于从COD为主向 $\text{NH}_4^+\text{-N}$ 为主转换的阶段;支流清河和坝河不仅是温榆河干流入河污染负荷的首要输入途径,而且支流上污水集中处理设施的排水是温榆河干流的首要补给来源(70.1%),其运行状况与升级改造对改善温榆河水环境质量至关重要.

Abstract: The spatio-temporal evolution of water environment quality in Wenyu River from 1980 to 2010 was studied comprehensively by the historical data analysis and field survey of COD and $\text{NH}_4^+\text{-N}$. Results showed that the water quality of Wenyu River watershed experienced the process of clean, pollution, serious pollution and pollution containment in the last 30 years, but still failed to meet the national surface water standard of China (GB3838—2002) at present. The water quality in the upstream of Wenyu River is better than the downstream, and Wenyu River has better water quality than Ba River and Qing River. Results of Pearson correlation analysis showed that concentrations of COD and $\text{NH}_4^+\text{-N}$ in the downstream of Wenyu River were significantly affected by Qing River. As far as COD and $\text{NH}_4^+\text{-N}$ in Wenyu River watershed are concerned, the ratio of $\text{NH}_4^+\text{-N}$ and its limit value in surface water standard (GB3838—2002) is much higher (at the range of 8~20) than that of COD (less than 1), indicating COD pollution is under control to some degree and $\text{NH}_4^+\text{-N}$ pollution becomes obvious. This fact infers that the dominant type of Wenyu River pollution is shifted from organic pollution to $\text{NH}_4^+\text{-N}$ pollution. Notably, as the two major branches of Wenyu River, Qing River and Ba River contributed not only most of the discharged pollutants loads, but also around 70.1% of the water flow from the effluent of municipal wastewater treatment plants (WWTPs). Therefore, the operation and upgrade of WWTPs play the most important role in improving water quality of Wenyu River.

Key words: [water environment quality](#) [spatio-temporal evolution](#) [Wenyu River](#) [non-conventional water source](#)

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