

基于GIS技术的北京通州区灌区生态需水研究

Ecological water requirement of irrigated region in Tongzhou District of Beijing based on GIS technique

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中文摘要:

生态需水是区域需水的重要组成部分, 灌区生态需水是维持灌溉农业持续发展的基础。在对降水、地表水和地下水分析的基础上, 利用地理信息系统(GIS)技术对北京市通州区生态系统进行了分类, 确定了不同生态系统的生态需水量。结果表明: 2003年通州区生态需水量为 $45.33 \times 10^6 \text{ m}^3/\text{a}$, 生态、生活和生产需水量是可供水资源量的1.23倍, 用水矛盾较为突出。在采用节水、开发新水源和区外引水等措施后, 2010年和2020年研究区的生态、生活和生产需水基本可以得到满足, 实现区域水资源的供需平衡。该文研究结果为通州区水资源的合理配置提供了科学依据。

英文摘要:

Ecological water requirement is one of the important components of regional water requirement, and is a base for sustainable development of irrigated region. Under the analysis of precipitation, runoff and groundwater resources, the ecological system in Tongzhou District, Beijing was subclassified using geological information system(GIS) technique, the water requirement of various types of ecosystem were determined. Results indicate that the ecological water requirement is $45.33 \times 10^6 \text{ m}^3/\text{a}$ in Tongzhou District in 2003, and total water requirements of daily life, ecosystems and production is 1.23 times of the available water amount. The shortage of water resources is serious in Tongzhou District. After the adoption of water-saving techniques, the exploitation of new water sources and water-conveying from other regions, the water requirement of daily life, production and ecosystem can be basically satisfied in 2010 and 2020. Balance between water requirement and water supply in the studied region is realized. The research provides a scientific basis for reasonable allocation of water resources in Tongzhou District.

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