

## 基于四水转化的灌区耗水量计算模型

Calculation method for irrigation district water consumption volume based on transformation of four water

中文关键词: [四水转化](#) [灌区耗水](#) [水均衡模块](#) [计算模型](#) [青铜峡灌区](#)

英文关键词: [water cycling](#) [transformation of four kinds of water](#) [water consumption](#) [irrigation area](#) [water balance module](#) [calculation model](#)

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中文摘要:

针对以往灌区耗水量计算方法的不足和灌区水循环机制的特点, 本文建立了基于四水(即大气水、地表水、地下水和土壤水)转化的灌区耗水量计算模型。该模型把灌区划分为农田、林草地、荒地、湖泊湿地和城镇用地五类水均衡模块, 重点考虑了人类活动对灌区农业、工业、生活和生态耗水量的影响。以宁夏青铜峡引黄灌区为例, 详细计算了各种耗水类型的耗水总量和耗用的黄河水总量, 并定量分析了各水均衡要素间的相互转化关系。模拟计算结果与试验观测结果对比分析表明, 该模型在平原灌区具有较好的模拟精度, 能够应用于生产实践。

英文摘要:

According to the characteristics of water cycling, a new model based on the transformation mechanism of four water (atmospheric water, surface water, groundwater and soil water) for calculating water consumption volume in an irrigation area is established. In the model, the irrigation area is divided into five water balance modules: field, forest and grass land, waste land, wetland and residential area. The influence of human activities on water consumption of agriculture, industry, domestic and ecology such as irrigation, exploitation of groundwater, waste water of industry and water for domestic use are considered. Taking Qingtongxia Irrigation Area as the case study, the quantity of total water consumption and the water obtained from the Yellow River are calculated for each consumption category. The water exchanges between water balance modules are analyzed. The comparison of calculation results with observation data shows that the computational model can exactly simulate the water cycle in the area to be studied.

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