

## Suitable eco-environmental water requirement in Sanmenxia Reservoir wetland based on 3S technology

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### ABSTRACT

Wetland is a special ecosystem formed by the interaction between water and land, which cannot be separated from the support and protection of water resources. Therefore, it is necessary to study the ecological environment water demand of wetland. This paper takes the sediment-laden river wetland-Sanmenxia Reservoir wetland as an example, constructed the calculation model of 10 indexes of consumable eco-environmental water demand and non-consumable eco-environmental water demand. At the same time, 3S technology was used to extract the area of various types of the Sanmenxia Reservoir wetland, the monthly water demand process and the annual optimal eco-environmental water demand of the Sanmenxia Reservoir wetland were calculated under the conditions of average precipitation for many years. The main conclusions are as follows: (1) On the basis of other scholar's research, increased water requirement indicators such as environmental purification water requirement, leaky water requirement, landscape protected water requirement and recreational water requirement. (2) The total water requirement for the most suitable eco-environmental in the Sanmenxia Reservoir is  $16.6918.5 \times 10^6 \text{ m}^3$ . Meanwhile, considering the particularity of the operation mode of Sanmenxia Reservoir, this study gives the process of the most suitable eco-environmental monthly water demand, which provides a scientific basis for the optimal allocation of wetland water resources in the reservoir. (3) Non-consumable eco-environmental water demand in Sanmenxia Reservoir is the main type of water demand, and among all types of eco-environmental water demand indexes, environmental purification water requirement is the largest. Therefore, controlling pollutant discharge is the primary task for the ecological environment restoration of Sanmenxia Reservoir.

*Keywords:* 3S technology; Sanmenxia Reservoir wetland; Computation model; Water requirement process; Suitable eco-environmental water requirement

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