



An evaluation of the ecological security of the Dongting Lake, China

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ABSTRACT

Evaluation of lake ecological security is important for sustainable management of lakes and regional ecological environment construction. Dongting Lake is the second largest freshwater lake in China; its ecological security directly threatens the ecological security of the middle and lower reaches of the Yangtze River. In this paper, the ecological security evaluation index system of the Dongting Lake is constructed, including target layer (first order), criterion layer (second order), and index layer (last order). The target layer is the ecological security of the lake, the standard layer includes five indicators, and the index layer includes 11 indicators. The comprehensive evaluation method is used to evaluate the ecological security of the Dongting Lake by assessing all indexes of every layer. The weight of each index is determined by analytic hierarchy process. The evaluation results showed that the ecological security score of the Dongting Lake is 58 points, belonging to sub-security level. At present, the Dongting Lake has problems of low ecological water level, reduced lake surface area, eutrophication, and reduced lake storage capacity. Therefore, in future, the industrial and domestic pollution sources should be controlled, and the carrying capacity of water environment should be improved.

Keywords: Lake ecological security; Evaluation; Index; Weighting and scoring; The Dongting Lake

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