Title:

Combining Box Counting-dimension with a Fuzzy Synthetic Evaluation Model Based Quantitative Evaluation on Soil and Water Erosion of Lake Dianchi Basin, China

Abstract:

Considering the various influencing factors of soil and water erosion in Lake Dianchi Basin, evaluation indices of soil and water erosion involving the fractal dimension of drainage network, the fractal dimension of terrain, elevation and slope are determined. The weight values of evaluation indices are given and the fuzzy synthetic evaluation model is established on the basis of the fuzzy mathematics and information diffusion principles. As a case study, the fuzzy synthetic evaluation model is applied to quantitatively evaluate soil and water erosion of Lake Dianchi Basin. The results show that the grade of soil and water erosion is at the secondary level and the indicator value of comprehensive evaluation indicator of soil and water erosion is 1.45 in Lake Dianchi Basin. The assessment results are in good agreement with the results of previous studies. The result indicates that the method is valid and evaluation system established is reasonable, and the fuzzy synthetic evaluation model can be regarded as a reference model for the quantitative evaluation of soil and water erosion.