

Evaluation model of major heavy metals pollution factors in coastal waters and sediments

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Received 22 October 2018; Accepted 15 January 2019

ABSTRACT

It has great a subjective influence on the evaluation of major heavy metal pollution factors in coastal waters and sediments by using the traditional Nemerow exponential method, without considering the harmful differences of different heavy metals, and resulting in a low accuracy of the evaluation results. In this paper, a new model to evaluate the major heavy metal pollution factors in coastal waters and sediments is established, to calculate the single pollution index and potential ecological risk index of heavy metals. On this basis, the fuzzy comprehensive evaluation method is used to construct the main heavy metal pollution factor model of coastal waters and sediments. The heavy metal pollution factor is reasonably evaluated and the risk grade of heavy metal pollution factor in coastal waters and sediments is obtained. The results of sampling analysis show that the evaluation results obtained by the model are as follows: the pollution index of heavy metals in the coastal water with the order of $Pb > Cu > Hg > As > Cd > Zn$; the potential ecological risk index of heavy metals in sediments is $Pb > Cu > As > Zn > Hg > Cd$. The pollution degree of area C is the highest, area A is the second, and area B is the smallest. The results show that the model can accurately evaluate the main heavy metal pollution factors in coastal waters and sediments.

Keywords: Coastal waters; Water bodies; Sediments; Single pollution index; Fuzzy comprehensive evaluation; Heavy metals; Pollution factors

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