

Source Study of Sand Dunes Sediment Using Fingerprinting Method in Jazinak, Sistan Plain

Abstract

Recognition of source areas of sand dunes is very important in wind erosion control projects. Due to the difficulties in application of traditional methods in recognition and determination of the share of sediment source identification, fingerprinting methods, are alternative and suitable methods which are considered by Different researches. In this research, using a suitable combination of geochemical and organic elements that are capable of separating various land uses, it has been attempted to determine the contribution of different uses in the sediment production of the sand dunes of the Wasinak area located in Zahak city of Sistan and Baluchestan province. At first, 20 samples of the probable sources of sediment and sand dunes were harvested. Then, the granulation of samples was done according to ASTM standard. After performing necessary tests and analyzing laboratory data, statistical techniques such as analysis of variance, Kruskal-Wallis analysis to verify the diagnosis And determining the optimal combination of tracking detector tests were done. The results of the analysis indicated that the three detectors detect N, P, and Ca along with organic matter (OM) were selected as the optimal combination for separating different land uses in the region. According to the results, the use of sand sediments (sediment of Sistan river) was 68.3% and agricultural use with 2% respectively had the highest and lowest share in the sediment production of sand dunes in Jiznak region of Sistan. The results show that sandy sediments (Sistan dryland sediments) have the highest and the least relative importance in sediment production, with the density of 21.34 and agriculture, with 0.04 respectively. The relative error of the hybrid model to estimate the contribution of different application in the production of sediment that is equal to 6.07% percent and the coefficient of model was tested 93.93% . Overall, the results indicate that the relative error performance fingerprinting technique capable of producing high resolution sediment.

Key words:

Sediment Sources, Fingerprinting, Tracers, Jazinak, Sand Dunes



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