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خلاصه مقاله:

Potentially harmful elements enter into the environment through mining and agricultural activities, causing water and stream sediment pollution. Ecological risk analysis helps to determine sediment pollution, to recommend remediation measures for human health safety and the survival of aquatic species. The sediments were analysed for acidity and redox potential using a pH-meter and spectrophotometer, respectively. Nickel, cadmium, arsenic, chromium, lead, zinc, and iron were measured using atomic absorption spectrophotometer. The mean value of Cd exceeded the threshold effect limit guideline indicating its adverse effect to water dwelling organisms. Anthropogenic metal input identified cadmium, lead, arsenic, zinc and chromium contamination in locations ۳, ۶, and ۷. Modified risk assessment code, toxic response index and comprehensive ecological risk values exhibited considerable to high ecological risks in locations ۳, ۶, and ۷. The highest comprehensive ecological risk value recorded ۶۵۳.۲ in location ۳, showing high ecological risk to water dwelling organisms. Durbin Watson ecological risk value (۲.۳۴) is between a critical value of ۱.۵ < d < ۲.۵ showing auto correlation of the data. Potentially harmful elements obtained Durbin Watson value of ۲.۷۷, which exceeded the range showing lack of auto correlation. Strong correlation of arsenic, lead and zinc showed their affinity and common source of enrichment. Principal component analysis indicated that the sources of the elements were mostly geological weathering, sewage disposal, industrial wastes and agricultural fertilizers. The study integrated recent ecological risk indices with multivariate and regression statistics. This is helpful in interpreting related environmental problems by scientists in other parts of the world.

کلمات کلیدی:

sediment contamination, ecological indices, aquatic species, toxic response factor, atomic absorption spectrophotometer

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