

Risk Assessment of Heavy Metals in River Sediments and Suspended Matter in Small Tributaries of Abandoned Mercury Mines in Wanshan, Guizhou

Authors : Guo-Hui Lu, Jing-Yi Cai, Ke-Yan Tan, Xiao-Cai Yin, Yu Zheng, Peng-Wei Shao, Yong-Liang Yang

Abstract : Soil erosion around abandoned mines is one of the important geological agents for pollutant diffuses to the lower reaches of the local river basin system. River loading of pollutants is an important parameter for remediation of abandoned mines. In order to obtain information on pollutant transport and diffusion downstream in mining area, the small tributary system of the Xiaxi River in Wanshan District of Guizhou Province was selected as the research area. Sediment and suspended matter samples were collected and determined for Pb, As, Hg, Zn, Co, Cd, Cu, Ni, Cr, and Mn by inductively coupled plasma mass spectrometry (ICP-MS) and atomic fluorescence spectrometry (AFS) with the pretreatment of wet digestion. Discussions are made for pollution status and spatial distribution characteristics. The total Hg content in the sediments ranged from 0.45 to 16.0 g/g (dry weight) with an average of 5.79 g/g, which was ten times higher than the limit of Class II soil for mercury by the National Soil Environmental Quality Standard. The maximum occurred at the intersection of the Jin River and the Xiaxi River. The potential ecological hazard index (RI) was used to evaluate the ecological risk of heavy metals in the sediments. The average RI value for the whole study area suggests the high potential ecological risk level. High Cd potential ecological risk was found at individual sites.

Keywords : heavy metal, risk assessment, sediment, suspended matter, Wanshan mercury mine, small tributary system

Conference Title : ICERM 2019 : International Conference on Environmental Remediation and Management

Conference Location : Dubai, United Arab Emirates

Conference Dates : December 19-20, 2019