



## **The Influence of Suspended Solid on the Distribution of Heavy Metals in Riverine Environment**

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The accumulation of heavy metals in sediment has been a significant issue in Erren River which is a major river in southern Taiwan. During the past few decades, a lot of scrap hardware recycling factories were established in middle section of Erren River watershed. Many of these factories were found to discharge large amounts of untreated industrial wastewater containing heavy metals, highly acidic and toxic substances into Erren River illegally, which caused serious pollution. Because of the elevated environmental consciousness of surrounding citizens since 1980s, Taiwan government has implemented a series of pollution reduction strategies to restore the ecological integrity as well as to improve the water quality of Erren River. Despite all these efforts, the concentration of heavy metals cannot meet the water quality standards due to the ignorance of the heavy metals release from the sediments, which is another key factor affecting the aqueous concentration of heavy metals.

Since the distribution of heavy metal is controlled by the transport phenomenon within surface water sediment, a pollution management model was developed by combining the soil hydrological assessment model and water quality model to simulate the distribution of heavy metal affected by flow, sediment yield and suspended solid. The Soil and Water Assessment Tool (SWAT) was employed to estimate the soil flux by using local climatic and topographical data, soil properties, soil utilization categories and vegetation types. The SWAT-CUP was used to calibrate all the required parameters. And, copper and zinc were selected to be the key indicators to simulate the heavy metal distribution by using Water Quality Analysis Simulation Program Model (WASP). By considering the government heavy metal emission control measures and the location of factories, the heavy metal yields and their distribution within aqueous and sediment phases were calculated. Based on the above models, different scenarios were designed, including suspended solids yield in dry period and more-stringent heavy metal emission control measures to estimate the influence of heavy metals distribution in the investigated river system. This pollution management model will be the reference as the heavy metal pollution management and water quality assurance standard in the future watershed management strategy.