

VARIATIONS IN FLUXES OF HEAVY METALS DURING INTENSE RAINSTORMS IN SMALL SUBTROPICAL WATERSHEDS

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Short duration high-intensity rainstorms result in rapidly changing hydrographs in streams of mountainous subtropical islands and often lead to the delivery of pulses of terrestrial material to the coastal ocean. We have evaluated the short term and annual variability in heavy metal transport to estuaries and coastal waters. Because lower reaches of the streams in our study pass through areas with vastly different populations, our research has focused on spatial and temporal variations in the composition and abundance of dissolved and suspended matter in the waterways. The concentrations of dissolved and suspended heavy metals and the isotopic composition of Pb vary during rapidly changing hydrographic conditions. These variations are inferred to reflect rapid changes in the source of materials including: 1) pulses of easily eroded soils and 2) rapidly mobilized anthropogenic material accumulated since the previous rainstorm on the impervious urbanized surfaces of the watershed. Thus, fluxes of heavy metals derived from natural processes are supplemented by anthropogenic activity in the watershed. Natural soils from the unimpacted portions of the watersheds comprise the bulk of suspended material flux during storms. Anthropogenic contributions of Pb are easily resolved from natural inputs, but these are less obvious for other metals such as Cu and Zn.