

Sediment Toxicity Identification and Evaluation (TIEs) methods have been used for twenty years to identify the causes of toxicity in sediments around the world. We summarized and categorized results of more than 80 peer-reviewed TIE studies into non-ionic organic, cationic, ammonia and “other” toxicant groups. We further categorized results by whether the study was performed in fresh- or marine water sediments, and whether the study was performed using whole sediment or interstitial water TIE methods. When all studies were grouped, non-ionic organic toxicants, either singly or in combination with another toxicants were implicated in 75% of all studies. When studies were divided into interstitial water TIE methodology compared to whole sediment TIE methodology, results indicated that studies performed using interstitial water TIE methods had cationic metals and nonionic-organic toxicity in approximately equal roles in sediment toxicity. In contrast, studies using whole sediment TIE methods report nonionic organic chemical toxicity, either singly or in combination with another toxicant, in 95% of all sediments tested. Cationic metals play a much smaller role in whole sediment TIE studies— only about 22% of all sediments had a metals signal. The discrepancy between the two methods can be attributed to exposure differences. Contrary to earlier studies, ammonia plays only a minor role in sediment toxicity.