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Comparison of Surficial Sediment Quality in the St. Louis River Area of Concern, MN/WI, with Other North American Sites

By Judy L. Crane, Donald D. MacDonald, Dawn E. Smorong, Leanne J. Fisher, Shelee L. Hamilton, and Chad A. Huntington

Abstract—The distribution of surficial sediment contaminants within the St. Louis River Area of Concern (AOC), MN/WI, was compared to levels of contamination that have been measured at other AOCs in the Great Lakes basin, and in areas elsewhere in North America. Mean probable effect concentration quotients (PEC-Qs), which provide an indicator of ecosystem health by using a mixture of sediment chemistry data, were used to evaluate the potential toxic effects of contaminated sediments on benthic invertebrates in the selected areas of interest. The results of this evaluation indicated that sediment quality conditions in the St. Louis River AOC varied widely. Twenty-six percent of samples in the St. Louis River AOC were associated with low risk (i.e., mean PEC-Qs of <0.1), 56% of samples were associated with moderate risk (i.e., mean PEC-Qs of 0.1 to 0.6), and 18% of samples were associated with high risk to sediment-dwelling organisms (i.e., mean PEC-Qs of >0.6).

Among the Great Lakes AOCs that were considered, the highest levels of chemical contamination were observed in surficial sediments from the Grand Calumet River AOC, IN. Based on the median of the mean PEC-Q values calculated, the St. Louis River AOC ranked sixth in terms of chemical contamination among the eight AOCs considered in this analysis. Among the six other geographic areas in the United States included in this analysis, the highest levels of contamination were observed in sediment samples from the Willamette River, OR and Anacostia River, DC. The St. Louis River AOC ranked fourth in terms of chemical contamination when compared with the areas located outside the Great Lakes basin. When both the Great Lakes AOCs and other areas in the United States were considered, the St. Louis River AOC ranked ninth highest among the 14 areas. Interpretation of the results of this screening assessment should be made in the context of the uncertainties identified for this analysis.