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A Preliminary Study of Phosphorus Variations in Lake Erie and its Major Tributaries

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Abstract

As a recurring symptom of eutrophication in Lake Erie, massive blooms of harmful algae pose a threat to safe drinking water supply and recreational water use. Causes of the recent re-eutrophication in the lake include changes in the tributary phosphorus loading and/or increases in the internal nutrient loading potentially mediated by the colonization of zebra and quagga mussels. This study is to investigate the phosphorus variations in different nearshore locations of the lake and its major tributaries for a better understanding of the lake's trophic conditions. A total of 21 water samples were collected from Lake Erie and its major tributaries from Detroit Michigan to Buffalo New York. These samples were filtered and measured on phosphorus before and after digestion to determine the concentrations of soluble reactive phosphorus (SRP) and total dissolved phosphorus (TDP), using an automated discrete analyzer. Our results showed that the average concentrations of SRP and TDP in its major tributaries were significantly greater than those in the lake. The concentrations of SRP and TDP in tributaries were 0.003-0.118 and 0.002-0.112 mg/L, respectively. The concentrations of SRP and TDP in the lake were 0.00-0.01 and 0.003-0.014 mg/L, respectively.