

Zhang, Xiaomi¹, Rygwelski, K.R.², Rowe, M.D.², Rossmann, R.³, Kreis Jr., R.G.².

¹Z-Tech Corporation, an ICF International Company, Large Lakes Research Station, 9311 Groh Road, Grosse Ile, MI 48138; ²U.S. EPA, ORD, NHEERL, Mid-Continent Ecology Division, Large Lakes Research Station, 9311 Groh Road, Grosse Ile, MI 48138. ³Visiting scientist, Large Lakes Research Station, 9311 Groh Road, Grosse Ile, MI 48138. **Global and local contributions to mercury concentrations in Lake Michigan and impact on fish consumption advisories**

LM2-Mercury, a mercury species mass balance model developed for Lake Michigan, was used to assess mercury cycling in Lake Michigan. A calibrated model (including a hindcast) was used to predict mercury concentrations in the lake based on various sensitivity and management scenarios. The model results indicate that atmospheric components including wet deposition, dry deposition, and mercury absorption are very important in controlling the mercury concentrations in the lake. Based on two very different global background scenarios, the model was used to investigate the relative importance of global vs regional impacts to mercury concentrations in Lake Michigan. The model results for the global background scenario, based on information from the most recent literature, indicate that the global contribution could be the foremost controlling factor of the Hg concentrations in the lake. Model forecasts of total mercury concentrations in the water will be compared to EPA 2001 fish consumption criteria. Although post-audit data are limited, model predictions appear to compare well to measured mercury concentrations. This abstract does not necessarily reflect U.S. EPA policy.