

ANALYSIS OF SEDIMENT QUALITY OF SUMMIT LAKE, AKRON, OHIO

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Nineteen surficial sediment samples were collected from Summit Lake, which lies in the urban setting of Akron, Ohio. These samples were analyzed for water, organic, and CaCO₃ content; grain size; and trace metal (Zn, Pb, Cr, and Cu) concentration from totally digested sediment. In water depths less than 5 m, sandy sediment with a low water content (<80%) is present due to increased wave energy in the shallow water environment. In water depths greater than 5 m, mud (sand content <5 wt. %) with a high water content (>85%) has accumulated as a result of sediment focusing. Interestingly, loss-on-ignition organic content of the sediment remains rather uniform throughout the lake at between 15-20 %. Trace metal concentrations were compared to the Effects Range Median (ERM) and the Probable Effects Level (PEL), to assess sediment quality. Trace metal concentrations greater than the ERM or PEL are considered likely to have adverse biologic effects. In 18 of the 19 samples, Zn concentration exceeded both the ERM and PEL. In 5 of the 19 samples, Pb concentration exceeded the ERM, whereas 18 of the 19 samples exceeded the PEL. No sample exceeded the ERM for Cr, however 3 of the samples exceeded the PEL. One sample exceeded the ERM for Cu, however 4 of the samples exceeded the PEL. These high trace metal concentrations are a function of the urban setting of Summit Lake. Spatial analysis of the trace metal data shows that concentrations increase toward the southern end of Summit Lake. The elevated trace metal concentrations toward the southern end of the lake are a result of spatial variations in both sediment transport-depositional patterns and anthropogenic sources. Some samples near the southern end of lake were located near a storm-water drain and overgrown filled-land containing industrial debris.