

# **ENVIRONMENTAL DISTRIBUTION OF MERCURY RELATED TO LAND USE AND PHYSICOCHEMICAL SETTING IN WATERSHEDS OF THE APALACHICOLA-CHATTAHOOCHEE-FLINT RIVER BASIN**

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## **ABSTRACT**

In August and November of 1992, 19 main-channel, tributary, reservoir, and floodplain sites in the Flint and Apalachicola River basins were sampled as part of an occurrence and distribution survey for trace-element and organic contaminants in fluvial sediments. Extreme flooding in much of the lower Flint River basin resulted from Tropical Storm Alberto (July 1994) and moved large quantities of soil and sediment in the lower Flint River basin, and to a lesser extent, in the Apalachicola River basin. Thus, the Alberto flooding provided an opportunity to re-examine spatial patterns in these data. All but five of the sites sampled in 1992 were re-sampled in August 1994; additionally, four new sites in the lower Flint River drainage were sampled. The most distinctive post-flood difference was the marked decrease in the concentration of fine sediments in the stream channels an observation consistent both with the transport and deposition of sand-sized material in the stream channels and with the discharge of fine-sized material from the basin. The larger post-flood median-TOC concentrations suggest that substantial quantities of organic-rich fine sediments were transported out of wetland floodplain areas. Antimony, Cr, Cd, and Hg were diluted by the flood and Pb was enriched, but most of the trace elements measured in this study had post-flood concentrations that were like their pre-flood concentrations. The mixed spatial and temporal pattern in the streambed concentrations of trace elements in sediments is an indication that a large, but variable, portion of the trace-element loading to the lower Flint River basin derives from atmospheric deposition. In general, the largest mean concentrations of trace elements in sediment are for the trace elements with the largest emissions to air. The SVOC data for sediment and air similarly indicate a variety of sources. Polycyclic aromatic hydrocarbons were detected three to four times as frequently at main-channel and reservoir sites than at tributary sites suggesting a predominance of point-source industrial inputs. Detection frequencies of phenols and phthalates generally were higher in the tributaries and lower at all sites following the Alberto flood, indicating regional sources.