# BIOLOGICAL ASSESSMENT OF CHRONIC TOXICITY IN TRAIL CREEK, AN URBAN STREAM EXPOSED TO A CHEMICAL SPILL, ATHENS, GEORGIA

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**Abstract**. During late July 2010, a fire at the J&J Chemical Company in Athens, GA resulted in a chemical spill into East Fork Trail Creek, a tributary to the North Oconee River. Because the plant used a variety of toxic chemicals, including formaldehyde and 1,4-dichlorobenzene, to manufacture janitorial chemicals, a lethal concentration of the chemical cocktail was released into this urban stream while the fire was being extinguished. The Georgia Department of Natural Resources estimated fish mortality to be over 15,000 individuals and macroinvertebrate populations were also decimated. To assess chronic sediment toxicity, we followed the EPA's protocol "*Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates*". In October 2010, we sampled sediment from five locations along Trail Creek to test for chronic toxicity of invertebrates. We used these samples, along with a control and laboratory reference sample, to measure growth and survival of the aquatic crustacean *Hyallela azteca* in a 28 day, 5 replicate sediment toxicity test. Mean survival varied from 7.5 – 95 percent in samples collected from Trail Creek. Mean survival was significantly different ($P<0.0001$, $\alpha=0.05$) between sites. Only one site, Olympic Drive, located immediately downstream from the spill, had significantly lower mean survival than the laboratory reference (mean survival = 7.5 and 90 percent, respectively). Because of the severity of the spill, along with the possibility of unrelated contamination from upstream sources, we recommend regular biological monitoring of sediment to assess Trail Creek's recovery process.