

**IMPACTS OF ANNUAL FLOW VARIATION FROM 2001 TO 2011 ON AQUATIC
INVERTEBRATE COMMUNITIES OF THE CHATTAHOOCHEE RIVER
DOWNSTREAM OF THE BUFORD DAM**

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Abstract

The majority of the world's large river systems are affected by dams. The influences of these unnatural flow regimes are wide-ranging, affecting both abiotic and biotic conditions. The Chattahoochee River in Georgia is highly regulated, and below the upper-most large dam at Buford supports a recreational fishery. The goal of this study was to examine the effects of flow variation on the macroinvertebrate community downstream from the Buford Dam, and to relate those effects to the health of the fishery. Quarterly macroinvertebrate samples were taken from 2001-2011 at six locations. Data were analyzed via ANOSIM to determine differences in community composition between high-flow (mean discharge = 58.27 m³/s) and low-flow (mean discharge = 26.53 m³/s) years. Taxa that contributed most to community differences were determined via SIMPER analyses and subsequent t-tests. Several insect taxa (e.g. *Cheumatopsyche* and *Ceratopsyche* caddisfly larvae, *Maccaffertium* mayfly larvae, and *Taeniopteryx* stonefly larvae) were more prevalent under the high-flow regime. Non-insect macroinvertebrates (e.g. *Crangonyx* amphipods, Tricladida flatworms, and *Caecidotea* isopods) were more abundant under low-flow conditions. In terms of taxon richness, no significant effects of flow regime were detected. Low-flows could have negative consequences for the fish populations in the river by limiting densities of key forage insects. However, low-flow years consisted of a community dominated by amphipods, also a significant source of food for many fish species. Overall, while the macroinvertebrate community is significantly affected by flow

variation, the fishery below the Buford Dam probably has an adequate food base during both low- and high-flow years. The information from this study can be applied to a regulated rivers (with or without fisheries) throughout the country.