

# **THE SPATIAL DISTRIBUTION OF DISSOLVED PESTICIDES IN SURFACE WATER OF THE APALACHICOLA-CHATTAHOOCHEE-FLINT RIVER BASIN IN RELATION TO LAND USE AND PESTICIDE RUNOFF-POTENTIAL RATINGS, MAY 1994**

by Daniel J. Hippe and Jerry W. Garrett

## **ABSTRACT**

During baseflow conditions in May 1994, streamwater samples were collected and analyzed from 67 locations in the Apalachicola-Chattahoochee-Flint (ACF) River basin. These data were used to evaluate the number and concentrations of dissolved pesticides present in streams in relation to (1) predominant land uses in the ACF River basin; (2) location along the mainstem of the Chattahoochee, Flint, and Apalachicola Rivers and selected large tributaries; and (3) pesticide runoff characteristics. In comparisons of streamwater samples from groups of small watersheds representing the predominant land uses in the ACF River basin (referred to as indicator sites), pesticides were detected most frequently and at highest concentrations in urban watersheds; followed by suburban, rowcrop agriculture, poultry and livestock production, and forested watersheds. Herbicides used for selective preemergent weed control had the widest distribution among indicator sites; however, herbicides used for nonselective weed control were present at highest concentrations. Herbicides used for postemergent weed control were rarely detected in streamwater samples from indicator sites, or mainstem and large tributary sites that possess mixed land uses (referred to as integrator sites). The insecticides carbaryl, chlorpyrifos, and diazinon were detected with greatest frequency in streamwater samples from (1) indicator sites in areas of urban and suburban land use, and (2) integrator sites located near the Atlanta Metropolitan area. These sites comprised 18 of 22 sites where insecticide concentrations exceeded existing standards or guidelines for protection of aquatic life. Pesticides with long soil half-lives, high water solubilities, and low organic carbon partitioning coefficients were detected with greatest frequency and highest concentrations in streamwater samples. These compounds have large runoff-potential ratings, and include several of the herbicides used for selective preemergent weed control, all the herbicides used for nonselective weed control, and the insecticide diazinon. Pesticides having medium runoff-potential ratings were detected primarily in streamwater samples from sites in areas of suburban and urban land use and from integrator sites located near the Atlanta Metropolitan area.