

ENVIRONMENTAL DISTRIBUTION OF ORGANOCHLORINE CONTAMINANTS IN THE APALACHICOLA-CHATTAHOOCHEE-FLINT RIVER BASIN

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ABSTRACT

The Apalachicola-Chattahoochee-Flint River basin (ACFB), a high-order catchment draining approximately 20,000 square miles of Georgia, Florida, and Alabama, is one of 20 large-scale water-resource areas included in the first phase (1991-1996) of the U.S. Geological Survey's (USGS) National Water-Quality Assessment (NAWQA) Program. Measurement of the occurrence and distribution of organochlorine compounds (pesticides and PCB's) in the aquatic environment is a primary design component of NAWQA. Contamination of stream-bed sediments and aquatic life is an indicator of the environmental effects of various land uses within different environmental settings. During August and November, 1992, and August and September, 1993, 37 stream sites and 7 reservoir sites in the ACFB were sampled for bed-sediment (mineral and organic matter less than 2 mm) and either *Corbicula* spp. (Asiatic clam) or *Gambusia affinis* (mosquito fish). *Corbicula* were collected in sufficient abundance for sampling at 25 of the 37 stream sites and 3 of the 7 reservoir sites; and *Gambusia* were collected at 3 stream sites in forested wetland floodplain settings. These sites were selected to represent ranges in drainage order, physiography, geology, climate, and land use. Bed sediments at 18 of the 37 stream sites and all 7 of the reservoir sites had detectable quantities of at least one of the 38 organochlorine compounds analyzed. Measurable quantities of 13 of these compounds were detected in the ACFB. *Corbicula* or *Gambusia* from 9 of the 28 stream sites and 2 of the 3 reservoir sites where sufficient samples were found had detectable quantities of at least one of 29 organochlorine compounds analyzed. Measurable quantities of 10 of the 29 organochlorine compounds were detected in tissue samples. Chlordane and nonachlor isomers and dieldrin were found in the sediments of low-order urban catchments in the Piedmont (metropolitan areas of Atlanta and Columbus, Georgia) and the Chattahoochee River reach between Atlanta and Columbus. These compounds were used extensively as termiticides and for wood preservation until their restriction in 19___. Although DDT and its metabolites, DDD and DDE, were also detected at urban-influenced Piedmont sites, DDE was detected in sediments at all but 5 of the 20 Coastal Plain catchments sampled. DDT was widely used as a general-purpose insecticide and, more specifically, for mosquito control. The prevalence of DDE in the sediments of Coastal Plain catchments suggests predominantly agricultural use. The occurrence pattern presented by stream-bed sediment was similar to that seen in the tissue samples.