



Columbia Environmental Research Center

Environmental Contaminants and their Effects on Fish in the Mobile, Apalachicola, Savannah, and Pee Dee River Basins

Introduction

Fish are exposed to many types of environmental contaminants, some of which accumulate in fish tissues and are passed on to consumers (other fish, wildlife, and humans). These contaminants and others, which do not accumulate in tissues, may degrade the health of fish and weaken viable populations. In 2004, the Large River Monitoring Network (LRMN) of the U.S. Geological Survey's Biomonitoring of Environmental Status and Trends (BEST) Program measured environmental contaminants and their effects in fish from the Mobile, Apalachicola, Savannah, and Pee Dee River Basins.

Assessing contaminant effects in these river basins is important for the protection of species dependent on these unique ecosystems and the people utilizing the resources. Contaminant sources in these basins include agriculture, mining activities, and isolated point sources associated with municipal and industrial activities and hazardous waste sites.

Objectives

The objectives for monitoring a subset of the large rivers of the Southeast U.S. are to: 1) document the occurrence of contaminants and their effects in fish; 2) compare biomonitoring results from the southeast region to other major river basins in the United States; and 3) establish contaminant and biomarker benchmarks for the measurement of temporal trends. This study will assess how fish are affected by water quality and help resource managers and researchers identify and prioritize



investigations regarding contaminant threats to biological resources. This study will also provide information on the potential contaminant effects on fish-eating organisms including raptors (eagles, osprey), mammals (otters, mink), and humans in these basins.

Field Sampling and Laboratory Analyses

Common carp (*Cyprinus carpio*) and largemouth bass (*Micropterus salmoides*) were collected from 13 sites in the Mobile, Apalachicola, Savannah, and Pee Dee River Basins from October to December 2004. Ten male and 10 female fish of both species at each site were collected by electrofishing; fish were held alive until processed. Individual fish were examined, measured, and dissected. Blood, liver, kidney, spleen, gonads, gills, and lesions were collected for fish health and reproductive biomarker analyses. Whole-body fish composites were analyzed for contaminant concentrations. All

data will be available at <http://www.cerc.usgs.gov/data/best/search/> after report publication.

Cooperators

Field sampling and fish processing were conducted by USGS biologists, with assistance from staff associated with the US Fish and Wildlife Service Daphne Field Office and the South Carolina Cooperative Fish and Wildlife Unit. Chemical and biomarker analyses of fish tissues were conducted by USGS laboratories (Columbia Environmental Research Center, Leetown Science Center, Florida Integrated Science Center) and the University of Florida, Gainesville.

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