

WATER-QUALITY CONDITIONS DURING FLOODING CAUSED BY TROPICAL STORM ALBERTO, JULY 1994

In July 1994, rainfall from Tropical Storm Alberto caused devastating flooding over a large part of the ACF River Basin. Streamflows exceeded a 100-year recurrence interval throughout much of the Flint River Basin and exceeded a 500-year recurrence interval for more than 75 miles of the Flint River from Montezuma to Albany, Georgia (Stamey, 1995; 1996).



Cropland along Flint River near Oakfield, Georgia

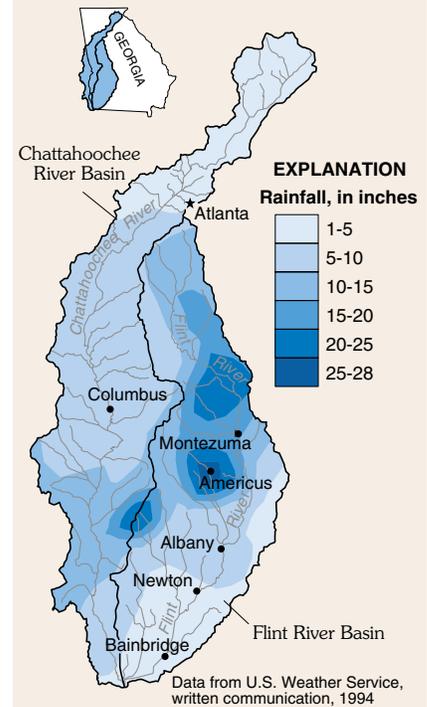


Flint River in Albany, Georgia

The slow rise and fall of floodwaters submerged some cropland and communities located near streams for up to a week (Photographs are by Timothy W. Hale, USGS, July 1994.)

directly attributed to fertilizer applications and wastewater discharges. The quantity of nitrogen and phosphorus in floodwaters of the Flint River represent just 4.5 and 2.8 percent, respectively, of estimated annual point and nonpoint sources of these nutrients from wastewater discharges, animal manure, and fertilizer in the affected area (Frick and others, 1996).

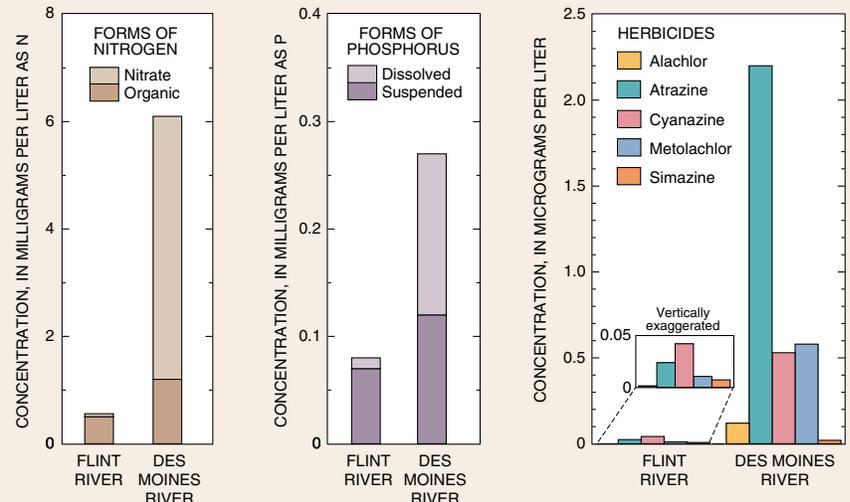
Pesticide concentrations in the Flint River peaked 4 to 6 days prior to the flood crest. Throughout the flood, pesticide concentrations in the Flint River and its tributaries were well below present USEPA drinking-water criteria (Nowell and Resek, 1994); only the insecticides carbaryl, diazinon, and chlorpyrifos approached or exceeded existing guidelines for protecting aquatic life. Herbicides used for selective preemergence weed control for cotton, corn, and peanuts were detected at higher concentrations than pesticides registered for other uses. However, the quantities present in floodwaters represented just 0.09 to 2.4 percent of the estimated annual use of these compounds on cropland within the affected area (Hippe and Garrett, 1995).



For much of the Flint River Basin upstream of Albany, Georgia, 10 or more inches of rain fell during Tropical Storm Alberto (July 4–7, 1994). The worst flooding in the Basin occurred between Atlanta and Newton, Georgia.

Floodwaters caused dam breaks; damaged roads, culverts, and bridges; and inundated several communities and large areas of prime agricultural land. Although nutrients and pesticides were present in floodwaters, the large volume of runoff and redeposition of sediment and associated contaminants in flood plains may have greatly reduced concentrations and downstream transport in floodwaters.

Nitrogen and phosphorus concentrations during flooding were similar to long-term average concentrations observed at monitoring sites in the Flint River Basin. The predominant forms of nitrogen and phosphorus in floodwaters are associated with transported organic detritus and fine-grained sediments eroded from upland areas, rather than forms that can be



Nutrient and pesticide concentrations were substantially lower during flooding of the Flint River following Tropical Storm Alberto in July 1994, than during flooding of tributary streams in the Upper Mississippi River Basin in July 1993 (Emitt C. Witt, II, USGS, written communication, 1994). Less intensive crop production and more extensive buffering of stream sides by forests and wetlands may have contributed to lower nutrient and pesticide concentrations in floodwaters in the Flint River.