



USDA-CSREES 2007 National Water Quality Conference

The application of Inductively Coupled Plasma - Optical Emission Spectrometry

In this study, trace metal analysis of the surface water from two watersheds, Flint River (Huntsville, Alabama) and Flint Creek (Decatur, Alabama) respectively, was conducted to obtain baseline data of current heavy metal concentrations. Both watersheds are located within the Wheeler Lake Watershed and have segments that are listed on the 303d impairment list. The physicochemical (causes of pollution and quantity of pollutants) forms of the metals as a means of assessing their availability and non-availability for toxicity to aquatic organisms was investigated. Surface water samples were collected randomly from selected sites in the rivers aforementioned. The samples were digested using closed vessel microwave digestion and analyzed for Al, Fe, Cd, Mn, Pb, Se and Zn using an Inductively Coupled Plasma Optical Emission Spectrometer (Perkin-Elmer Optima 2100 DV series). The concentration range of the metals was determined. The concentration ranges of all the metals measured were slightly below or well as above the EPA guidelines for acceptable concentrations for drinking water. The input of dissolved and suspended chemicals from Flint Creek and Flint River during storms influences water quality in the reach of the Tennessee River from which the City of Huntsville, Alabama withdraws about forty percent (40%) of its drinking water. The preliminary data was statistically analyzed with multiple linear regressions and determined to be very significant. The EPA Region 3 Risk Based Concentration Table was also utilized for data comparison.

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