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The region of Ribeirão Preto City located in São Paulo State, southeastern Brazil, is an important sugarcane, soybean and corn producing area. This region is also an important recharge area (Espraiado) for groundwater of the Guarany aquifer, a water supply source for the city and region. It has an intercontinental extension that comprises areas of eight Brazilian states, as well as significant portions of other South American countries like Argentina, Uruguay, and Paraguay, with a total area of approximately 1,200,000 Km². Due to the high permeability of some soils present in this region, the high mobility of the herbicides and fertilizers applied, and being a recharge area, it is important to investigate the potential transport of applied fertilizers to underlying aquifer. The cultivation sugar cane in this area demands the frequent use of nitrogen as fertilizer. This research was conducted to characterize the potential contamination of groundwater with nitrogen in the recharge area of groundwater. Seven groundwater sample points were selected in the Espraiado stream watershed, during the years of 2005 and 2006. Samples were collected during the months of March, July, and December of each year. Three replications were collected at each site. Groundwater was also collected during the same months from county groundwater wells located throughout the city. The following six wells were studied: Central, Palmares, Portinari, Recreio Internacional, São Sebastião, and São José. Nitrate water samples were analyzed by Cadmium Reduction Method. No significant amount of nitrate was found in the recharge, agricultural, area. However, nitrate levels were detected at concentrations higher than the Maximum Concentration Level (MCL) of 10mg/L in downtown, urban, well located away from agricultural sites with no history of fertilizer or nitrogen application.

Keywords: Groundwater, Nitrate Contamination, Nonpoint Source Pollution, Toxic Substances, Water Quality
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The Pascagoula River System, draining 8,504 mi² in southern Mississippi, is the nation’s largest, unregulated and pristine river system. Streams in the Pascagoula Basin are generally the first to be affected during times of drought. With the presence of several industries in this basin that use surface water, staff of MDEQ/OLWR are conducting studies within the basin to determine the sources of baseflow for the basin's streams. During October 2007, 25 sites near 7Q10 were individually measured during a baseflow study conducted in the Upper Leaf River Basin utilizing SonTek Flowtracker Acoustical Doppler Velocity meters. The Upper Leaf drains 1,752 mi² and has been in drought conditions throughout the year. The baseflow sites’ discharge ranged from no-flow observations to a basin high of 375 ft³/s discharging into the Lower Leaf River Basin. Utilizing ArcGIS, the basin's topography, geology and hydrology was mapped and analyzed. Results indicated that geology plays a pivotal role in the distribution of ground water flow into the surface water streams based on unit discharges per square mile. Generally, flows in the northern third of the Upper Leaf were non-existent correlating to geology. In the southern third, ground water discharge is more prevalent also correlating to the basin’s geology. This study will form the foundation for further studies in the basin for ground water/surface interactions utilizing the mappable Miocene aquifer units and stream incision to locate significant ground water contributions. These methodologies can then be applied to the entirety of Pascagoula River Basin.

Keywords: SW/GW Interactions, GIS, Hydrology, Hydrogeology, Geomorphology
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The Upper Noxubee watershed, Choctaw County, Mississippi, constitutes a proposed site for a recreational and water management reservoir located on Sand Creek. Prior to the development of the site, the geology and hydrogeology of the watershed was investigated to determine suitability for impoundment. The proposed site is located within the Wilcox Group, a sequence of interbedded sands, silts, clays and lignites of Paleocene age. Geological cross sections derived from geophysical logs and field exploration provided information regarding facies distributions within the proposed site area. Discharge characteristics of both perennial and ephemeral streams offered data concerning surface runoff that can then be related to infiltration into the Lower Wilcox Aquifer. Along with a spring inventory, the discharge measurements aided in determining if there is sufficient water flow for impoundment. The Mississippi State University Chemical Laboratory conducted water analysis to establish the quality of the water to be impounded. All data collected and the characteristics of the proposed reservoir are mapped using ArcGIS 9.2 software.

Keywords: Geology, Hydrology, Surface Water, Water Quality