

Mining activities and its influence on the levels of pH and alkalinity in fluvial waters

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Mining activities are responsible for several impacts over environment. In this paper we describe the research developed in the Capivari watershed, karst (lime producing) region of State of Parana, near Curitiba Metropolitan region in Southern Brazil. The region's climate is subtropical Cfb (Köppen), with average rainfall of 1400 mm and evapotranspiration around 800 mm, with no defined dry season. In this area, small producing units of family agriculture are predominant and few animals are raised for own consumption. The riparian forest is deprived of characteristics and, in many places, inexistent. Water samples were collected for examination of pH and alkalinity in two seasons within a range average of twelve years (1986-2000). It was evaluated 387 days of sampling in the years from 86 to 87 and 1095 days in the years from 98 to 2000 and an analysis of variance was performed over the data in order to find out differences between series 86/87 and 98 to 2000. Throughout this period, it was found that the average pH increased on average 0.5 units, ranging from 7.47 in 86/87 to 7.97 in 2000. The alkalinity increased by 15% ranging from 88 mg/L at 86/87 to 124 mg/L in 2000. It was observed, through aerial photos and satellite imagery, that the areas of metamorphic dolomites mining, have expanded at an average rate of 47,000 m²/year from 1980 to 2000. All these areas became sites of exposed surfaces covered by thin limestone fragments of rock and dust in direct contact with the environment. Ratings along the river and its tributaries within the basin revealed in the local downstream and closer to the quarries, have shown that the pH of the water has been increasing, becoming more basic and with lower electrical conductivity. The results seem to confirm the hypothesis that the expansion of the areas of mining would affect pH and thus the alkalinity of stream water. Keywords: mining, mining impact, pH changes, fluvial ecology.