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SPATIAL VARIABILITY AND EXPORT OF THE CARBON IN RELATION TO DIFFERENT LAND USE OF THE JAGUARI AND CAMANDUCAIA RIVER BASIN, BRAZIL

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The objective was to understand the effect of changes in land use, through socioenvironmental indicators (population growth; collection and treatment of sewage), on the spatial variability of carbon in two medium sized watersheds belonging to the Piracicaba basin. The Jaguari river that has as one of its major tributaries the Camanduacia river, is an important provider the "Cantareira" reservoir system that supplies around six million inhabitants of the Metropolitan Region of São Paulo, Brazil. A one year hydrological study began on January 2015, in six municipalities in each medium sized watersheds, to monitor some water quality parameters such as pH, electric conductivity (EC), dissolved oxygen (DO), dissolved organic and inorganic carbon (DOC and DIC). For that purpose we established 19 sampling stations along the Camanducaia (8 stations) and Jaguari (11 stations) river channels; two stations at their main tributaries Mosquito and Camanducaia Mineiro, respectively; and another two stations at small streams in headwater areas of the Jaguari and Camanducaia watersheds. The regression analysis showed that the population growth was positively related to the increase of DOC of the Jaguari downstream (urban zone) (R^2=0,7). The DOC tends to increase by multiples of 2.5 and 3.5 times from forested headwater areas to the most downstream stations of Jaguari and Camanducaia, respectively. Regarding DIC these multiples are 4 and 2 times greater. It was concluded, there is a tendency of the effects of land use changes, such as urbanization, to alter the hydrobiogeochemistry dynamics related to the carbon cycle.

Keywords: watersheds, hydrobiogeochemistry, water crisis, land use, water quality, carbon cycle.