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Stream Water Quality Monitoring as a Tool to Evaluate a Payment for Environmental Service Program in Extrema (Minas Gerais), Brazil

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Posses and Salto de Cima small catchments (1,200 ha and 1,500 ha, respectively) are situated in the municipality of Extrema (MG), southeast Brazil. Their stream outlets enter into the Jaguari River, an important tributary to the Cantareira Reservoir, which supplies part of the water demand of the São Paulo metropolitan area. These catchments, with pastures as the dominant land use, have been targets of a payment for environmental service program that aims to face successive water deficit that has occurred in the region. Possible improvement of water resources has been investigated by this present hydrobiogeochemical study. Evaluations included the temporal variation of water quality parameters as well as a comparison of two monitored streams in relation to these variables, since their catchments are at different stages in the environmental recovery process. From January to December 2017 sample collections and field measurements were conducted every two weeks, continuous physical-chemical measurements were taken each 10 minutes, and automatic samples were collected each 72 hours. Additional automatic samples were collected when extreme rain events occurred. The evaluated parameters were: flow, temperature, pH, electrical conductivity, dissolved oxygen, carbon, nitrogen and major dissolved ionic elements as well as suspended particulate matter.



Some signals of pollution point sources were detected on some random days and times at the Posses stream. Despite the confirmed improvement of the streamwater quality in response to the forest vegetation recovering at riparian zones and hilltops, it was observed that other watershed management practices regarding anthropic effluents must be elaborated in the public policies. Consequently we recommend that monitoring of streams and rivers be done using equipment that can get continuous data throughout the days as a means to detected eventual signals of point pollution.

Keywords: hydrobiogeochemistry, pastures, reforestation, small catchments, watershed management