Turbidity as a measure for assessing ecosystem services promoted by riparian forests on water bodies

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This study has been carried out at basin of upper Capivari, from Ribeira do Iguape river. This is in the region of Araucaria forest, which is part of the Atlantic Forest Biome of southern Brazil. Our aim was to develop a method to assess the status of the riparian forest and the drainage channels of the lowest order and, indirectly, the ecosystem service provided for water quality by the presence of riparian forests. The riparian forests are ecotones between terrestrial and aquatic areas and the removal or reduction of river banks is the main cause of surface water degradation. To evaluate the quality of the water body and the benefits provided by presence of riparian forest, turbidity was used as a parameter. Turbidity is known to be linked to the input of particulate material into surface waters. The intensity of turbidity relies on several variables, including the status of the riparian forest and the climate, whose rainfalls may reaches 40 to 60 mm by hour on subtropical zones. In this work, we analyzed the presence or absence of riparian forests by means of aerial images and, with this data, two indices were made: density and number of riparian forest fragments. In addition, we registered also the punctual records contributions that comes from exposed soils located near the water and in the points devoid of riparian forests, which drainage goes directly into the river. Preliminary observations showed that, for a point of the basin without riparian forest, considering periods of torrential rains, the turbidity level reached 280 UNT. The advantage of the index utilization is that those can be used to compare data of a same place over time and among similar places (same topography, soil and climate). New samples of turbidity will be collected, accompanied by a rainfall monitoring, and the correlation coefficients between turbidity and the presence of riparian forest on the watershed study will be obtained. From these correlations we will be able to assign a monetary value to the ecosystem service provided by the presence of riparian forests, because waters of low turbidity usually require treatment of lower-cost to become drinkable. This study is part of EMBRAPA macroprogram called “Impacts of Climate Change on Agriculture and Water Resources, diagnosis and proposals for adaptation and mitigation in watersheds in different biomes".