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Hydrologic Processes Modeling and Watershed Management - developing tools for Amazonian region.

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Due to increasing impact on water resources in Amazonian region, related to deforestation. agriculture and grazing expansion, infrastructural projects like highways and hydroelectric plants, it is urgent to consider watershed monitoring and management planning. This study aims to develop some management tools, like watershed models, through investment in human capabilities in Amazonian region and investigation of comprehensive models in order to: i) achieve understanding of fluxes mechanisms; ii) estimate erosion losses; iii) evaluate trends and estimates in biogeochemical cycle changes. The proposal is highly supported by institutional interchange between Amazonian research centers, traditionally focused on Ecosystem studies, biogeochemical cycling and territory management, and others Brazilian scientific centers that develop numerical simulation of solute transport in porous media, a potential tool to evaluate aquifer pollution by contaminants. The project has three components with particular approaches. The first refers to "Watershed Management Models" applied to different sub-regions in Eastern Amazonia, by three students. The study sites are located in: a) Paragominas/PA, where small catchments of Uraim River have been monitored for two years; b) Santarém county, on Mojuí River watershed and c) counties of Canarana and Querência, Mato Grosso state, on Xingu River headwaters. These three regions have different histories of occupation and demographic fluxes, but all of them are under the impacts of recent agriculture expansion. In this initial phase of the project (six months), we should use GIS tools to present results from landscape analysis and aquifer vulnerability classification model GOD. Erosion model studies are proposed in the second project component that should be applied initially to monitored small catchments in Paragominas $region. \ The \ third \ part \ of \ proposal, \ ``Hydrogeochemistry \ Modeling'', \ as \ a \ partnership \ between$ hydrobiogeochemistry researchers and those dedicated to numerical modeling of transport phenomena. We should use a numerical model to represent nutrient transfers in saturated porous media, and try to validate the model through its application on field data.

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