

ABSTRACT VOLUME
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Water Quality and Land Use-Cover Relationship in Microbasins of Atlantic Forest Biome – Rio de Janeiro – Brazil



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Introduction and objectives

93% of Atlantic Forest Biome were deforested in Brazil. The deforestation occurred mainly because urban occupation and agriculture increasing. 60% of Brazil population live in this biome and the water demand is very high. Agricultural wastes contributed to increase water pollution. Then, it is necessary study the water and land use-cover relationship to support watersheds management. The proposal of this study was to analyze the relationship between water quality and land use-cover in three Rio de Janeiro state microbasins that have family farming and land degradation processes.

Methodology approach

Land use-cover maps were obtained from high resolution satellite images (IKONOS) and the percentage area of the classes were calculated applying ARCGIS 10. The main classes obtained were: Urban areas, Agriculture, Pasture, Bare soil and Natural vegetation. Water sampling was done in the down stream point of each microbasin along three years. Water quality parameters analyzed were: suspended solids, turbidity, electric conductivity, dissolved oxygen and coliforms. Finally, the percentage area of land use-cover classes were correlated to water parameters results applying statistical method.

Analysis, results, conclusions and recommendation

Parameters related to non-point pollution like suspended solids and turbidity presented better correlation to agriculture, bare soil, pasture and natural vegetation classes. On the other hands, water parameters related to point pollution like dissolved oxygen and coliforms presented better correlation to urban area class, because small agriculture predominates in these microbasins, not applying much fertilizer in soil. Electric conductivity was related to both pollution sources. It was possible identify that microbasins presenting more natural vegetation areas and less pasture and bare soil areas allow better water quality to population. Flow and precipitation measurement of three studied microbasins (Caixa D'Água, Santa Maria and Brejo da Cobioa) were used to understand the final results of correlation Finally, GIS and remote sensing are powerful tools to study relation between water and land use-cover. Besides, it is important to create governmental politicians and to finance the microbasin hydrological instrumentation and monitoring water quality and land use-cover relations to guide planning and good agricultural practices in microbasins in Atlantic Forest Biome, Brazil.