

LAND USE EFFECTS ON THE ECOHYDROLOGY IN HEADWATER AREAS OF THE JAGUARI RIVER BASIN

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The headwaters of the Jaguari river basin are strategically important to the water resources in the largest reservoir system of the São Paulo state, called "Cantareira", which has recently suffered the largest water crisis in its history. Investigation at small watershed scales is a valuable tool to understand land-water interactions and their associated hydrological processes. Our research approach included evaluations of streamwater quality and quantity, aquatic biota, overland flow, soils, land use, and land management. As part of the region is under a conservation program of payment for environmental services (PES), we also examine the efficiency of this public policy. In addition, our study could help guide the agricultural management of rural properties. We detected that water quality drastically decreased downstream in the main channels of the basin and that the reforestation has improved some water quality parameters over time. Moreover, using macroinvertebrates as bioindicators we observed a trend of stream aquatic biota recovery at a catchment under the PES program comparing with a quasi-pristine stream and another stream under impacts from careless agriculture practices. Besides this, some preliminary results demonstrate a need to regulate the use of pesticides at some agricultural areas; also considering the potential of sediment and water transfer from the steep slopes to the stream, improved management for farm soil and water conservation is needed urgently in this part of the basin. Such management together with PES programs can help to maintain the sustainability of the water resources of the "Cantareira" under increased rainfall variability.

Keywords: agricultural watershed, ecosystem services, hydrobiogeochemistry, reforestation, water conservation, water crisis.