

LAND USE CHANGE AND ITS EFFECT ON WATER QUALITY IN SANTA LUCIA BASIN, URUGUAY.

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Agricultural activities have a direct effect on water quality. Nutrient such as Nitrogen (N) and phosphorous (P) are driven into water courses affecting the ecosystem equilibrium and consequently, deteriorating water quality. Changes in land use have a direct effect on water quality. Intensive agricultural systems have a more significant nutrient output than natural pastures. In Uruguay there is lack of information regarding the nutrient load of different intensive farming systems. Several reports have shown that water bodies surrounded by intensive farming systems have worse water quality than those surrounded by natural pastures. Half of the population receives tap water from the Santa Lucia River. During the last decade, the water quality of this course has been impaired, which has been associated with the intensive farming surrounding some sections of its riverside area, where both agricultural and dairy farming systems coexist. Given the importance of Santa Lucia's catchment, it is necessary to estimate the nutrient loads of the different land uses. This information could be used to predict their relative impact on water quality and identify the critical areas where the best nutrient management practices should be prioritized. Every ten years the Uruguayan Government carries out a broad nationwide agricultural survey which results in an exhaustive and thorough Geo-referenced database. Based on this information, we analyzed the change in land use, land coverage, and stocking rate that occurred from 2000 to 2011. We also estimated N and P loads exported to freshwater systems by linking the previous results with export coefficients from national and international bibliography. Furthermore, we identified and mapped critical areas using modern GIS technologies. We expect that the information gathered with this research could be used by stakeholders and decision makers in order to establish more specific and precise regulations towards water quality improvement and freshwater ecosystems protection.