

LAND USE AND AQUATIC ORGANIC MATTER FOR WATER RESOURCES PLANNING AND MANAGEMENT

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ABSTRACT: Organic matter (OM) occurs naturally in water bodies. It is a biota energy source, besides participating and controlling physical and chemical processes in aquatic environments. OM composition is very complex, composed of labile and refractory fractions, which is intrinsically related to its sources. Anthropogenic activities alter the natural balance by discharging effluents into water bodies, as they generally contain large OM concentrations, making it an important indicator of water quality. The analysis of the river basin land use and land cover (LULC) conditions can indicate the pollution risks to which its water resources are subject, like the expansion of anthropogenic areas, forested and permeable areas reduction, and others. In this way, this paper aims to evaluate how the relationship between the aquatic OM and watershed LULC have been analyzed by different authors, and to establish new strategies for water resources planning and management. The analyzed studies evaluated present several configurations of LULC river basins, as forested areas, agricultural profile, or heavily urbanized regions. Considering the parameters analyzed are recurrent nutrients, electrical conductivity, pH, DO and solids. Usually the OM analysis is quantitative, by traditional parameters (BOD, COD or DOC). However, few studies have evaluated the relationship between LULC and the composition of aquatic OM applying, for example, spectroscopic analyzes to verify how LULC influences the aquatic OM characteristics. Regarding the relationship between water quality parameters and LULC statistical models are widely used because of their simplicity. However, these models hardly explain the wide complexity of the river basin processes. On the other hand, physic based models are less common due to the scarcity of data available. As highlighted, the relationship between LULC and water quality is a current subject and explored worldwide. Nevertheless, although OM is a very common pollutant it has not been observed many studies investigating the relationship between aquatic OM and watershed LULC, especially in the case of a deep characterization in the OM fractions presents in the water resources. In such context, the use of GIS tools or physic based modeling are little used for an in-depth analysis of such complex relationships.

Keywords: Water quality. Land cover. Aquatic pollution.

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