NITROGEN DYNAMICS IN THE WATERSHED OF THE CAMANDUCAIA AND JAGUARI RIVERS, SP AND MG STATES, BRAZIL

Cristiane Formigosa Gadelha da Costa[1], Ricardo de Oliveira Figueiredo[2], Plinio Barbosa de Camargo[1], Marisa de Cássia Piccolo[1], Lucas de Camargo Reis[1], Edmar Antônio Mazzi[1], Maria Lucia Zuccari[2]

1 CENA/USP - Center for Nuclear Energy in Agriculture, Isotopic Ecology Laboratory; Nutrient Cycling Laboratory. Piracicaba-SP. cristianeformigosa@usp.br
2 EMBRAPA - Brazilian Agricultural Research Corporation, Embrapa Environment. Jaguariúna, Brazil.

Different human activities have altered the nitrogen cycle and modified the interactions between terrestrial and aquatic ecosystems. In order to understand the effects of land use changes on water conservation, we investigated the nitrogen spatial distribution in rivers of different orders in the medium sized watersheds of the Jaguari and Camanducaia rivers. The Jaguari river, which has the Camanducaia river as its largest tributary, is an important supplier of the "Cantareira", a system of interconnected reservoirs, which supplies about 6 million inhabitants of the Metropolitan Region of São Paulo, that recently faced one of the largest water crises in Brazil. A one year hydrological study began in January 2015 at these medium-sized watersheds in six municipalities. We monitor some stream water quality parameters such as pH, temperature, electrical conductivity (EC), dissolved oxygen (DO), biochemical oxygen demand (BOD), nitrate (NO_3^-), ammonium (NH_4^+), nitrite (NO_2^-), dissolved organic nitrogen (DON) and total nitrogen (TN). For this purpose, 19 sampling stations were established along the main channel of the Camanducaia (8 stations) and Jaguari (11 stations) rivers, two stations at their main tributaries, Mosquito and Camanducaia Mineiro, and two stations at small streams in headwater areas of Jaguari and Camanducaia, totaling 23 points. TN had a high correlation with EC in the Jaguari and Camanducaia rivers (r^2 = 0.7 and 0.8, respectively). For the Jaguari and Camanducaia rivers we observed high correlations of DIN and BOD (r^2 = - 0.9) and TN and DON (r^2 = - 0.8), which also correlated with DO. However, for the Camanducaia river this correlation was less strong (from r^2 = -0.4 to -0.6), characterizing oxidative processes in the interactions between terrestrial and aquatic ecosystems. The relation Cmax:min showed that in the upper part of the watershed there is a greater diffuse contribution of the nitrogen input in the aquatic system compared to the downstream reaches, which was characterized by a greater contribution of point sources, such as domestic sewage, in the Jaguari river (NO_3^-=5µM, NH_4^+=14µM, DON=12µM at upstream sampling stations; and -NO_3^-=83 µM, NH_4^+=8 µM, DON=82µM at downstream stations). Moreover we observed a high NO_2^- concentrations at downstream stations in both rivers affected by urbanization (J10=52µM, J11=77µM, C7=32µM, C8=57µM). It was concluded that the distribution of nitrogen partitioning occurs differently at the studied watersheds, as urbanization drives different hydrobiogeochemical dynamics along the downstream reaches of such watersheds.

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