

Phosphorus geochemical mobility in the Ariranha Stream Basin, Poços de Caldas volcanic caldera, Brazil

DIEGO DE SOUZA SARDINHA^{1*},
FABIANA GONÇALVES CARVALHO¹ AND
LETÍCIA HIRATA GODOY²

¹UNIFAL, Poços de Caldas – MG, Brazil; (*correspondence: diegosouzasardinha@gmail.com)

²UNESP, Rio Claro – SP, Brazil; leticiahirata@gmail.com

The Ariranha Stream Basin has 6.29 km² and is located at Poços de Caldas volcanic caldera, Brazil, a suite of plutonic and volcanic rocks classified mainly as phonolites and nepheline syenites. The diversified land use comprehends mining activities, reforestation, pastures, native forests and Alfenas Federal University. Surface water samples were collected near the mouth for total phosphorus analyses from June 2014 to February 2015 (16 samples). Rainwater samples were collected at one sampling point located at Alfenas Federal University, using a “bulk” type collector (dry and wet deposition). A total of 15 rainwater samples were obtained between July 2014 and February 2015. Total phosphorus triplicates were determined by [1] and [2] methodology. The discharge was higher during November (0.53m³/s) than in September (0.01m³/s), with an average of 0.12m³/s. The total phosphorus average in surface water was 65.60 µg/L, with the lowest value obtained in June 2014 (6.27 µg/L), and the highest one in January 2015 (571.44 µg/L). The rainfall presented an average of 112.00mm, reaching 324.00mm in December and 9.00mm in June. Total phosphorus average in rainwater was 49.9µg/L, with the lowest (1.37 µg/L) and the highest (287.22 µg/L) values obtained in December. The weighted average values were considered for the total phosphorus calculations in surface water and rainwater during the sampling period (66.50µg/L and 57.95 µg/L, respectively). The total phosphorus flux in the river was calculated from the average discharge of 0.12m³/s and total rainfall of 1124mm, which was used to calculate the atmospheric input. The annual flux obtained is 245.42 kg per year in surface water and 409.73 kg per year in rainwater. Thus representing large inputs into the atmosphere at Ariranha Stream Basin, as demonstrated by the annual deposition rate reported for anthropogenic or geogenic inputs.

[1] Strickland, J.D.; Parsons, T.R. A manual of seawater analysis. *Bull. Fihs. Res. Bel. Can.*, v.125, p.1-185. 1960. [2] Valderrama, J.C. The simultaneous analysis of total nitrogen and total phosphorus in natural waters. *Marine Chemistry*, vol. 10, pp. 109-122, 1981.