Mapping of the water quality in the Amazon for the selection of treatment technologies in riparian communities

[a]Wasserman J C, [b]Damaceno V M, [c]Lima G B A

Riparian communities in the Amazonia suffer from a number of aquatic transmitted diseases, because they frequently consume water supplied directly by the river, with no treatment. Due to the fact that these communities area located in remote areas, adduction of water would be a challenging and expensive work, so a better solution would be the development of small water treatment plants in the neighborhood of the community. In order to carry out an adjusted technology a major issue is to determine the characteristics of the water that is going to be treated. Based on a large set of water quality data it was aimed to establish contour maps of temperature, pH, turbidity, conductivity, dissolved oxygen, flow rate and suspended matter concentration. The data were obtained from the Brazilian National Waters Agency that reports 54 water quality stations in the whole Amazonia region, with data since 1976 until 2005. The set of data for each parameter was organized in dry and wet seasons a and the average values for each season (z), together with geographic coordinates (x, y) was plotted as contours maps.. A total of 14 contour maps were constructed for each parameter and for wet and dry seasons. The results show that suspended matter concentration reach values of almost 1 g L^{-1} in both periods, with higher concentrations in the Southwestern part of the Amazonian. Conductivity show the same pattern during dry season while in wet season, this parameter is more evenly distributed. The lowest pH values were observed in the Northwestern part, in the Basin of the Negro River, during both periods, while the Eastern part of Amazonia presents values closer to neutrality. Dissolved oxygen is evenly distributed throughout the Amazonian environment, reaching values close to saturation. Flow rates are extremely high, mainly in the upper (?) stretch of the Amazon River, reaching values above 140,000 $m^3 s^{-1}$. It is concluded that simple treatment plants should be developed for the Riparian populations, because maintenance should not imply very complicate procedures. Finaly, although very little coliform bacteria data is available, drinking water treatment should not use chloride in the desinfection step, because in the presence of humic substances, the formation of trihalomethanes may be also harmful to populations.

[a] *Network for Environment and Sustainable Development – University Federal Fluminense, Niterói, Brazil (geowass@vm.uff.br)*
[b] *Post-Graduation Program in Management Systems, University Federal Fluminense, Niterói, Brazil.*
[c] *Laboratory of Studies of Risk and Industrial Processes, University Federal Fluminense, Niterói, Brazil.*