Capítulo 50

Evaluation of the use and quality of water in the east axis section of the São Francisco river integration project

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The present work aims to evaluate the water quality along the eastern axis of the São Francisco River integration project. For this, the statistical resource of Principal Components Analysis was used. The São Francisco River Integration Project (PISF) is an undertaking whose purpose is to transfer water between river basins, in this case capturing water from the São Francisco River and taking it to the semi-arid region of the Northeast, thus alleviating the water inequality of the place . This project has two axes, North axis and East axis. As for the East Axis, its length is about 220km and aims to bring water to 168 municipalities, benefiting an average of 4.5 million people. Paraiba River. Nineteen sampling stations located in reservoirs, backwaters or weirs were chosen, and physical-chemical and biological data were collected from the water present in these points, during campaigns 22 and 23 of the project's Water Quality and Limnology Monitoring Program. This program is carried out through a partnership between the Ministry of Regional Development and the Environmental Management Group (GGA) of the Graduate Program in Civil Engineering (PPGEC) at the Federal University of Pernambuco (UFPE). From these collected data, 11 variables were selected and then the Principal Components Analysis was applied. This analysis made it possible to convert the set of observations of 11 variables into another smaller set: the main components (key variables). These components, together, express a significant percentage of the variables. In the case of the research, we had a set of the first 5 components representing 75.08% of the data variance. Through these components and their respective connections with the 11 chosen variables, we can analyze in a more general way and with a good statistical security the state of the water in each selected point, as well as the state of pollution of that point. Finally, through this analysis we were able to notice a similarity between the points, called compensation reservoirs, forming a set with similar characteristics due to its nature of recent construction, another set formed by the dams and backwaters of the Paraíba basin. In addition, a difference was noted in the water quality of the first and last point analyzed, that is, the Itaparica reservoir

and the Epitácio Pessoa dam. In the case of the first point, a significant positive difference in quality, while the last point a negative jump in quality. Thus, with an overview of the conditions of the reservoirs along the East axis, it is possible to investigate the causes of pollution and direct solutions for the quality of the water offered through this project.

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