Variation of the chemical composition of Grouz dam waters, Eastern Algeria

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\textbf{ABSTRACT}

The quality of surface water has been deteriorated in recent years, due to agricultural, urban and industrial development. The objective of this study is to evaluate the impact of agriculture, and industrial wastewater on water quality of the Grouz dam in Eastern Algeria. To achieve this, the dam water composition has been established in the period between January 2007 and June 2010. The long-term trends are analysed using the least squares method. The results show a low salinity and a substandard concentration of different elements. Generally, the water feature is bicarbonated- chlorinated- sodic to calcic in connection with the lithology. Carbonates are in precipitation phase, while evaporates are in equilibrium or in dissolution phase. Most items that are in conjunction with fertilizers and effluent, increased during this period: EC (72.36%), COD (63.33%), BOD\textsubscript{5} (32.08%) and NO\textsubscript{3}/CO\textsubscript{3} \textsuperscript{175%}. The increase in nitrates is due to the contribution from fertilizers and nitrification of ammonium. The concentration of the other items (NO\textsubscript{2}/CO\textsubscript{3}, NH\textsubscript{4}\textsuperscript{+} and PO\textsubscript{4}\textsuperscript{3-}) decreased at the same time as that of dissolved oxygen (50%). The ammonium concentration decrease is related to nitrogen nitrification, while the orthophosphates concentration is related to its low mobility and to the different processes that can occur in the rivers. The increase in COD (27–145 mg/l O\textsubscript{2}), BOD\textsubscript{5} (2.1–10 mg/l O\textsubscript{2}) and the decrease in pH suggest a degradation of organic substance by micro-organisms that consume dissolved oxygen. A disturbing eutrophication of the reservoir appears seasonally after the spraying of fertilizers.

Keywords: Dam; Salinity; Nutrients; Precipitation; Dissolution; Eutrophication; Algeria

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