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## HYDROCHEMICAL CHARACTERISTICS OF THE JORDAN AND YARMOUK RIVERS: EFFECTS OF NATURAL AND HUMAN ACTIVITIES

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### ABSTRACT

*Water chemistry was used to assist in understanding the effect of human and natural activities on the Jordan and Yarmouk Rivers. Eighty-eight water samples were collected from different locations along both rivers and analyzed for major ions. The Yarmouk River samples were predominantly alkaline, with prevailing chloride and sodium, and low TDS values. The Jordan river samples are alkaline earth, with prevailing chloride, increased alkalies, and high TDS. The sampling took place in different time periods between April and July 1996 to determine the effect of changing seasons on the water chemistry. From the upper to lower reaches of both the Jordan and Yarmouk rivers, a systematic increase of most of the measured major ions concentrations is reported in July 1996. Strong variations were observed in the water chemistry between the different locations. As the distance increased from the mouth of the rivers, so did the salinity of the water. The study found that the Jordan River is affected by groundwater and the related anthropogenic activities on both sides of the Jordan Valley. The saline groundwater is from ancient trapped sea water or brine of deep seated origin. The water which dilutes the Yarmouk river is a  $\text{Ca}^{+2} - \text{HCO}_3^-$  type. The increase in the ion concentrations in 1996 compared to 1969 is due to the increase of the anthropogenic effects.*

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**Reference:** Howari, F.M. and K. M. Banat; *Hydrochemical Characteristics of the Jordan and Yarmouk Rivers: Effects of Natural and Human Activities*, Journal of Environmental Hydrology, Vol. 9, Paper 20, December 2001.

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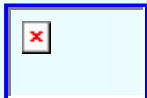
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