

Spatio-temporal changes of hydrochemical properties and factors controlling hydrochemistry of springs in the Seyfe Basin

*Cansu Yurteri¹

1. Hacettepe University

The aim of this study is to determine the hydrochemical properties of water resources in the Seyfe Basin and to understand processes involving water chemistry using statistical techniques such as principal component analysis (PCA) and cluster analysis. Seyfe Lake closed basin is located west of Kirsehir (Turkey) in the Central Anatolia. Considering the importance of the Seyfe Lake Basin for its water resources potential and due to its fragile ecosystem, a detailed hydrogeological characterization of the basin has been undertaken. In order to characterize hydrogeological system accurately, water samples were collected from springs, wells and drainage channels during September and December 2019 field campaigns from the Seyfe Lake wetland basin. The temperature, pH, total dissolved solids (TDS) and specific electrical conductance ($EC_{25^{\circ}C}$) were measured at the field and spatio-temporal changes of major ions are evaluated. The waters have neutral to slightly alkaline character, and most of the water samples are saturated with calcite, dolomite and aragonite minerals. According to the results obtained from Gibbs, Piper plot, and PCA, the water-rock interaction takes place without any remarkable ion exchange reactions. Water facies identified with the Piper diagram, supports this view. Water types are determined as $Ca-HCO_3$ for springs; $Na-HCO_3$ for wells; $Na-SO_4$ for drainage channel in the dry season and $Na-Cl$ in the rainy season. In the study area; ionic compositions of the springs are not affected by seasonal changes. The high sulfate concentration is probably related to the weathering of evaporitic rocks in the basin. The waters are grouped according to the results, and the difference observed within the groups are related to the lithology of aquifers and flow path of the waters.

Keywords: Hydrochemistry, Major ions, Kirsehir, Seyfe Closed Basin, Spatio-temporal changes, Central Anatolia