



Evaluation of Main Compositions of Water Chemistry Data By Graphical Methods, Edremit (Balikesir) Alluvial Aquifer System

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This case study aims to characterize and compare hydrogeochemistry based on major ion composition belonging to the year of 1970's, 2007 and 2008 for Edremit alluvial aquifer system which lies on the northwestern coast of Anatolia. Graphical representations including Piper, Schoeller, Stiff and Durov diagrams are applied to ease a systematic interpretation of a wide range of well chemistry data sets.

In Piper diagram, water types of the aquifer system are mainly dominated with calcium, carbonate-bicarbonate and sulphate ions. Water types of the site are separated as sulphate or carbonate-bicarbonate ion dominated zones for 1970's data. Comparing data of 1970's, 2007 and 2008 the newest data set is clustered into magnesium dominate zone. This is related to relatively deep groundwater chemistry affect probably resulting from long term groundwater withdrawal for irrigation in the aquifer system. The Schoeller diagram portrays differences of the data set of 1970's, 2007 and 2008 more clearly comparing the Piper diagram. In this diagram, higher portions of magnesium and sulphate composition of the well data belonging to the year of 2007 and 2008 are possibly related to deep routes of groundwater flow paths of the site and/or geothermal water mixing. In Durov diagram, the data set was projected to a rectangular shape and it was not immediately clear to differentiate ionic composition of the water. This is not coincidence because the fact that pH values do not change significantly over the years and its contribution is not substantial comparing to major ion chemistry. Finally, application of hydrogeochemical modeling as a further step was touched upon herein to further depict undergone processes and end-members in the whole aquifer system on Edremit Plain.

Keywords: Edremit, groundwater, aquifer, hydrogeochemistry, facies