Geophysical Research Abstracts
Vol. 12, EGU2010-11911-2, 2010
EGU General Assembly 2010

Seawater Intrusion and groundwater quality of the coastal area in Tripoli region, Libya

Rashid Abdalla (1), Thomas Rinder (1), Martin Dietzel (1), and Albrecht Leis (2)

(1) Institute of Applied Geosciences, Graz University of Technology, Graz, Austria (abdalla@sbox.tugraz.at), (2) Joanneum Research Center, Institute of Water Resources Management, Graz, Austria

In Libya groundwater is the main source of freshwater, providing a vital supplement to surface water sources. Groundwater availability and quality are however, vulnerable both to climate change and over-abstraction. In Libyan cities where the water table has lowered there has been a consequent impact on agricultural activities. Groundwater aquifers are either renewable or non-renewable. The renewable aquifers are those located in the north coastal strip with high precipitation rates. The large non-renewable sedimentary groundwater basins cover extensive areas in the central and southern parts of Libya and contribute large quantities of freshwater for local use, industrial and agricultural development. Seawater intrusion is a problem in the coastal areas of Libya. Most productive agricultural fields are in the northern coastal areas of the country where irrigation predominantly relies on groundwater. Seawater has moved inland because of heavy exploitation of the Miocene-Quaternary aquifer in order to meet the increasing water demand.

The physical and chemical parameters of groundwater such as electrical conductivity, pH, temperature and individual ion content were determined. Most of the wells showed high values of electrical conductivity. The increase of water salinity is directly related to the extreme pumping of shallow coastal aquifers and movement of seawater towards inland.

In some samples the increase of salinity corresponds to the ions abundant in seawater. In those solutions molar ratios of Cl/Br indicate influence of seawater intrusion. According to mixing calculations between fresh groundwater of the study area and Mediterranean seawater, the estimated concentration of seawater ranges from 10 to 15 wt%.