



Quantification of groundwater–seawater interaction in a coastal sandy aquifer system: a study from Panama, Sri Lanka

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The Panama coastal aquifer system is an important water resource in the southeast coast of Sri Lanka that provides adequate supplies of water for agriculture and domestic uses. One of the biggest threats to these fragile aquifers is seawater intrusion.

In this study [1], recharging mechanism and geochemical evaluation of groundwater in the coastal sandy aquifer of Panama were evaluated using chemical and stable isotope techniques. Thirty groundwater samples were collected and analyzed for their major ion concentrations and stable isotope ratios of oxygen ($\delta^{18}\text{O}$) and hydrogen ($\delta^2\text{H}$). All samples showed a decreasing order of concentrations for major anions in the order $\text{Cl}^- > \text{HCO}_3^- > \text{SO}_4^{2-} > \text{N-NO}_3^-$ while cation concentrations decreased with $\text{Na}^+ > \text{Ca}^{2+} > \text{Mg}^{2+} > \text{K}^+$. Dominant hydrogeochemical characterizations of the groundwater were Na–Cl and mixed Ca–Mg–Cl types of water. Results of saturation index calculations indicate that the investigated groundwater body was mostly saturated with respect to calcite, dolomite and gypsum.

In addition, stable isotope and geochemical data suggest that fresh groundwater in the aquifer is recharged mainly by local precipitation with only slight modification from evaporation and saline water intrusions. The communities in the study area depend almost exclusively on groundwater a better understanding of the hydrogeochemical characteristics of the aquifer system becomes increasingly important in the future for better local water resource management.

References

[1] Chandrajith, R., Chaturangani, D., Abeykoon, S., Barth, J.C., van Geldern, R., Edirisinghe, E.A.N.V. and Dissanayake, C.B. (in press): Quantification of groundwater–seawater interaction in a coastal sandy aquifer system: a study from Panama, Sri Lanka. - Environmental Earth Sciences, [doi:10.1007/s12665-013-3010-y].