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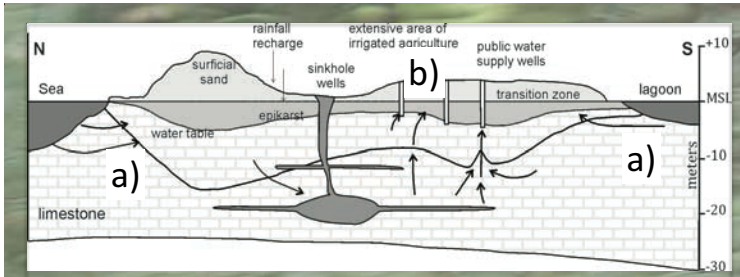
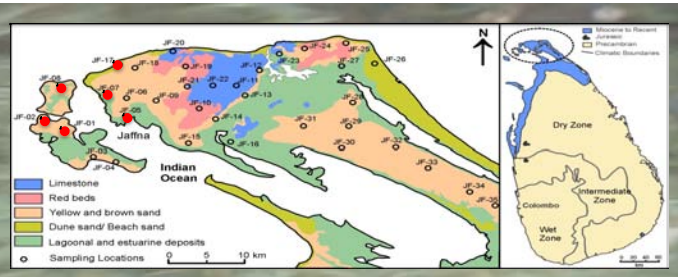
Investigation of irrigation return flows in a coastal karstic aquifer in the Jaffna Region (northern Sri Lanka): evidence from solutes and water stable isotopes

Rohana Chandrajith[1], Saranga Diyabalanage[1], K. M. Prematthilake[2], Christian Hanke[3], Robert van Geldern[3] and Johannes A.C. Barth[3]

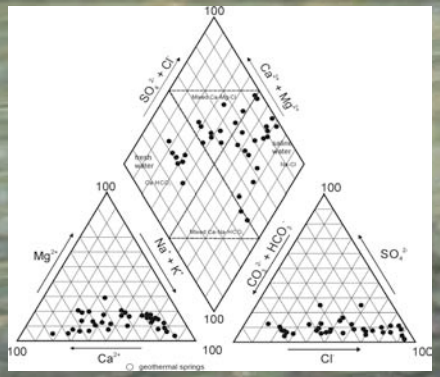


1) Coastal aquifers often suffer from two separate environmental pressures: a) seawater intrusion and b) input from agriculture.

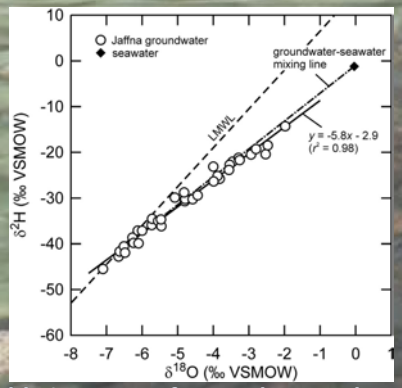


2) These influences were studied in karstic aquifers in the Jaffna Peninsula of Sri Lanka.

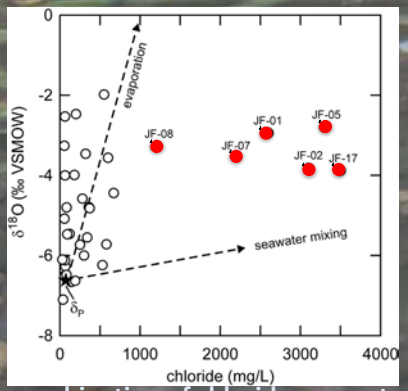
3) A total of 35 groundwater samples were collected and analyzed for major ions and H_2O stable isotopes ($\delta^{18}O_{H2O}$, $\delta^{2}H_{H2O}$).



4) Major ion contents showed carbonate dissolution and general increases in chloride, however they were not able to separate agricultural and seawater intrusion



5) Also stable isotopes of groundwater alone were not able to differentiate between seawater intrusion and agricultural irrigation return flows.



6) Only the combination of chloride concentrations with $\delta^{18}O_{H2O}$ identified the influences by seawater intrusion (red) and evaporation of irrigaton return flows (white).

CONCLUSION: the aquifer is currently more influenced by agriculture & irrigation, however, seawater intrusion begins to exert additional pressures.

Contacts:
[1] Department of Geology, Faculty of Science, University of Peradeniya, Sri Lanka.
[2] Water Supply and Drainage Board, Telewala Road, Ratmalana, Sri Lanka
[3] Friedrich-Alexander University Erlangen-Nürnberg (FAU), GeoZentrum Nordbayern, Schlossgarten 5, 91054 Erlangen, Germany

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