

## **The paralic region of the Lake Retba (Lac Rose) in Senegal: fresh and saline water layers as groundwater**

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The Retba Lake on the Senegalese Great Coast north east of Dakar is an endorheic hyper-saline lake. It is fed by a salt water wedge connected to the Ocean and situated below the coastal dunes and complemented by the rainwater of the wet season. Seven shallow piezometers drilled during this project along a northern and a southern transect with respect of the lake revealed a stratification of the groundwater. The conductivity in the transect samples varied from 430 to 47'700  $\mu\text{S}/\text{cm}$ . The lake itself showed values up to 2'309.1 mS/cm equivalent to a salinity of 150 ‰). Stable isotope  $\delta^{18}\text{O}/\delta\text{D}$  analyses revealed the presence of a salt water wedge through the coastal dunes and the presence of a fresh water lens on its top. On the southern transect rainwater penetrates into the top layer formed by nouackschottian deposits and flows through to the lake. The aquifer south of the lake is in contact with the lake water intrusions through a lower clay layer. Calcite and gypsum saturation indexes are exceeded in the lake water. Calcite saturation is also exceeded in the marine saline wedge. Almost 50 waters were sampled in traditional wells in an area of 6 x 8 km SE of the lake. In the well samples, the water composition, while still being influenced by the local saline conditions (300 to 3310  $\mu\text{S}/\text{cm}$ ), is determined by the local substrate. For these waters weak to strong salinization and alkalisation risks were found in water samples of wells in the area of the lake but are very strong in the zone of influence of the marine wedge.