

Interactive comment on “Salinization origin of Souf Terminal Complex: Application of statistical modelling and WQI for groundwater management” by Hafidha Khebizi et al.

Anonymous Referee #2

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The manuscript evaluates the processes that drive the salinization in the Souf Terminal Complex. Both the scientific aspect and the presentation of the manuscript need to be improved before it can be considered for publication.

Major comments:

The research questions are generally well defined, but they also need to be directly addressed by the analysis presented in the manuscript. For example, how is the effect of osmosis quantified here and how is the cause-effect relationship between osmosis and groundwater quality established? What is the quantitative linkage between salinization and groundwater level?

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The introduction should review the state of the art regarding the study of the linkage between groundwater quality and the processes of interest (e.g., lithological evolution, osmosis, anthropogenic withdrawal and the associated groundwater level change). The method section should be directly tied to the research questions and it should clarify the specific research questions that each method (e.g., cluster and PCA analysis) and metric (e.g., WQI) aim to address. Since the research questions are generally well defined, I suggest the authors organize the results and discussion tightly around each of the questions such that the readers are clear about how the scientific questions are addressed by the technical results. In addition, the discussion should be directly tied to the results presented in the manuscript.

Detailed comments:

Line 92. Please clarify the data source of Fig. 5.

Line 107. Note that here is already in the Method section, so I suggest the authors list only the processes that will be investigated here; more general descriptions/motivations should be moved to the introduction. Many processes are listed here, e.g., mineral dissolution, precipitation, reverse ions exchange, osmosis phenomenon, and anthropogenic process. Which ones are the focus of the manuscript? In the method section, it is also important to clarify how each of those processes is quantified and evaluated in the manuscript.

Line 109. Please briefly clarify what “standardized” refers to.

Section 2.3 Please clarify the rationale of employing WQI in this study and briefly clarify how WQI is calculated in this study.

Section 3. Before showing the findings from the statistical analysis, the measurements from the sampling analysis should be shown and the uncertainties of these measurements should be clarified.

Line 236. How is osmosis phenomenon quantified here and how is it linked to the result

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presented in the manuscript?

Line 240-256. This reads quite general and is not directly based on the results presented in the study. Discussion should be directly tied to the results shown in the manuscript and please reference results/figures that support the argument in the discussion.

Fig 12. The figure itself does not show “abnormal” condition as it does not clarify what a normal condition would look like.

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