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Interactive comment on "New regional stratigraphic insights from a 3D geological model of the Nasia Sub-basin, Ghana, developed for hydrogeological purposes and based on reprocessed B-field data, originally collected for mineral exploration" *by* Elikplim Abla Dzikunoo et al.

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Review of HESS paper entitled: New regional stratigraphic insights from a 3D geological model of the Nasia Sub-basin, Ghana, developed for hydrogeological purposes and based on reprocessed B-field data, originally collected for mineral exploration Elikplim

Abla Dzikunoo, et al. https://doi.org/10.5194/se-2019-145

This paper discusses the re-processing of regional-scale airborne electromagnetic data that is used in building a 3D geological model of the Nasia Sub-Basin, Northern Ghana. The authors, using and exploiting data from other studies and surveys, propose a geological model aimed both at new important knowledge strictly geological and stratigraphic, but above all they propose a new hydrogeological model aimed at finding groundwater resources. The overall objective of the research is to develop a decision-support tool for understanding groundwater occurrence to facilitate efficient development and optimization of the water resources in the area. Therefore, this paper has a high scientific level because of the amount of data presented, the complexity of the discussion and, last but not least, its potential application to water resources management. Its understanding in the appropriate geological context may provide criteria for water management in the area and to reduce drought risk/processes. In addition, the proposed methodology can be strategic in areas such as these where data availability is scarce and logistics difficult.

Nevertheless, there are some details that, in my opinion, may improve the quality of the presented data as well as the clarity of the text. Those are the following. The paper is quite concise and correctly organized. In the introduction section, add some "state of the art". Data and methods are sound and convincing. But, I would have expected to see borehole stratigraphic logs. The authors claim to have used logs for geophysical calibration as well. Honestly, I had some problems reading the conceptual model in Fig. 1b. Fig 1 a is not really clear. I suggest at least change the legend using the international standard of a geological legend. If there are hydrogeological data also from previous studies, it would be very useful to describe them and insert them in fig 1 and 1b, so readers begin to understand which aquifers aquiclude or aquitard are. The results and discussions are really interesting, but I suggest to change it up a bit. In my opinion, the geological and hydrogeological context will be better clarified. Moreover, please use the use the chronostratigraphic method (from oldest to newest or vice

versa); same symbols and colors in all figures, etc. better explain the hydrogeological interpretation (aquifers, aquicludes, etc). if it is possible, better clarify the geometry of the paleovalleys in hydrogeological terms and according to this new model we can hypothesize the potential of the aquifer? last doubt, do we have data on quality? If possible, make some figures even clearer