Comment on egusphere-2022-164
Anonymous Referee #1

Referee comment on "Geophysical analysis of an area affected by subsurface dissolution – case study of an inland salt marsh in northern Thuringia, Germany" by Sonja Halina Wadas et al., EGUsphere, https://doi.org/10.5194/egusphere-2022-164-RC1, 2022

The manuscript deals with geophysical surveys and interpretation in an area affected by sinkhole processes in Germania. The topic is certainly of interest to Solid Earth, and the article is worth to be published, being an interesting piece of work; I was particularly happy to have the chance to read it.

I have listed in the accompanying file a number of small edits, and requests of clarification on some issues that are not clear to me. Overall, I therefore require minor revisions and invite the Authors to carefully read my comments on the pdf file. Here, I just summarize the main points where the Authors should make an effort to further improve the quality and clarity of the paper, in my opinion.

The main problem with the manuscript is the extensive use throughout the article of the term "subrosion", which I strongly discourage. This because the term is not established in the scientific literature about sinkholes, and represents a potential source of confusion. I would suggest to use, as in the first line of the article, subsurface dissolution (which in many cases include also the leaching process).

At a greater detail, the existence of a well-established classification (proposed by Gutierrez et al., 2014, with recent developments by Parise, 2019, 2022) should be considered as reference point, and the interpretation of the geophysical surveys including the attribution to mechanism of origin, should be done in accordance with the categories of the classification above. In many parts of the manuscript I pointed out the confusion deriving from using the term subrosion, I really hope the Authors could take into account such observations and comments.
As for the sinkhole classification, as mentioned above there have been in the last years some updates published in the Encyclopedia of Caves (3rd edition) and in the Treatise on Geomorphology (2nd edition). I would suggest to quote also these recent developments. Below the complete references:


The issue of salt springs in the Khyffhauser hills (line 73) is very interesting, and might deserve some additional detail. Is there any reference to hydrogeological works in this area? Could these (if existing) could be useful for a deeper understanding of the sinkhole problems?

Comment on Figure 1: do we need so many different colors if you then summarize them in single formations? The map is quite complex and not easily readable, I suggest to simplify it in 6 colours (the 6 groups listed in the legend) to improve readability.

There is inconsistency among the initial figures as regards the formations shown. Figure 1 groups them in a way different from figure 2, and this makes difficult for the reader to understand the link among different figures and what is stated in the text. Author should decide which grouping is the best for their manuscript and adapt to that subdivision all the figures and the text.
Authors are here describing their interpretation of a sinkhole identified by sinkhole profiles. In line 216, they state it is a collapse sinkhole. This is just an example to outline how misleading is the use of the term "subrosion" (used few lines before by the Authors) that, on the other hand, would let the reader think to a completely different mechanism of origin, that is dissolution or suffosion. I once more insist on not using such a misleading term.

Risk: the term risk is not used in the proper way, in my opinion. In natural hazards, risk comprises all damage caused by natural processes, and include the economical and societal costs. These are not dealt with in the present manuscript, and the term risk is used with a meaning that should be (in my interpretation) corresponding to susceptibility, or, if including also temporal information, on hazard. I suggest therefore to change in the manuscript, and in the abstract as well, the word risk.

Reference list: please check the reference Schriel & Bulow (1926). It is exactly the same, and repeated as 1926a and 1926b.

In relation to the comments above, and to those in the attached pdf, I suggest to add the following references:


KAUFMANN, G. & ROMANOV, D. 2016. Structure and evolution of collapse sinkholes:
combined interpretation from physico-chemical modelling and geophysical field work. Journal of Hydrology, 540, 688–698.


For all the considerations above, I recommend minor revision.

Please also note the supplement to this comment: https://egusphere.copernicus.org/preprints/egusphere-2022-164/egusphere-2022-164-RC1-supplement.pdf