

***Interactive comment on* “Tracing groundwater salinization processes in coastal aquifers: a hydrogeochemical and isotopic approach in Na-Cl brackish waters of north-western Sardinia, Italy” by G. Mongelli et al.**

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Review of HESS paper entitled: Tracing groundwater salinization processes in coastal aquifers: a hydrogeochemical and isotopic approach in Na-Cl brackish waters of north-western Sardinia, Italy By: Mongelli et al. doi:10.5194/hessd-10-1041-2013

This paper discusses the occurrence of saline groundwater- brackish waters in a costal Mediterranean area (North-western Sardinia –Italy). The authors provide hydrochemical and mineralogical data upon which the origin of salt is discussed and related to

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potential hydrogeochemical reactions. Such information allows differentiating different flow path and, with them, the origin of salt in groundwater is related to distinct recharge areas, sea water intrusion and/or water rock-interaction factors. The paper is concise, correctly organized and their discussions are sound and convincing. In my opinion, the hydrogeological context will be better clarified. Its understanding in the appropriate geological context may provide criteria for water management in the area and to reduce desertification risk/processes. Therefore, this paper has a high scientific level because of the amount of data presented, the complexity of the hydrogeochemical discussion and, last but not least, its potential application to water resources management. 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:

- 1) pg 1042. Line 6 . . .consequence of bore hole exploitation. Change in: consequence of aquifer exploitation
- 2) pg 1042. Line 10 What is Nurra aquifer??? Perhaps it is better “The aquifer present in the Nurra Region”. Otherwise, use the correct terms for the aquifers of the study area (Ghiglieri et al. 2009)
- 3) Pg 1042 line 16 Water or groundwater?
- 4) Pg 1042 Line 26 Of the Nurra or of some specific aquifer. clarify
- 5) Pg 1043 Line 3 and 5 The same: please clarify
- 6) Pg 1043 line 17 change in: aquifer exploitation
- 7) pg 1045 line 14. Porto Torres Basin: where is in fig. 1? Perhaps, the Porto Torres Basin is referred to a geological structure
- 8) pg 1046 line 4: are in the cretaceous host only perched aquifer? Are you sure?
- 9) pg 1046 line8-10. This period is not clear. Perhaps, it is better to define the aquifer (hydrogeological unit) with the terminology used in Ghiglieri et al.2009.

10) pg 1046 line 12-14. where is Jurassic aquifer? Where is Calich basin? Please, define better

11) pg 1046 line 19 not clear: where is Baratz lake basin? I think that you have to better explain the hydrogeological setting.

12) pg 1047 line 25: not only groundwater!!!

13) pg 1048 line 19 In the legend of figure 1 are reported: sampling site and code of water sample. But in the text you write also rock sample: please add in legend of fig. 1

14) Pg 1050 line 12 should also be considered (Directive 98/83/EC).

15) pg 1052 line 27. What is Nurra waters? Please, specify the aquifer

16) pg 1053. Line 1. Please, define better the aquifer/river/lake with brackish water.

17) pg 1053 line 9, 24, 15 and 26. See comment 13

18) Comments to figures Fig. 1 Revise the limit and presumed limit of hydrogeological basin: it is not clear! Revise the arrow that show the groundwater flow direction. Specify better the aquifer: in the study area there are different aquifers!

Fig 2 Reading fig 1 and fig 2, I find some difficult. I think that it will be better to use the same color or fill for the geological formations. Are you sure that the groundwater flow directions reported in the sections are correct? If not, I think that it is better to delete this information from the fig.2.

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