

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.

G. Mongelli et al.

michele.paternoster@unibas.it

Received and published: 22 April 2013

As suggested by the reviewer we have modified throughout the text the terminology related to aquifers of the study area referring to the paper of Ghiglieri et al. (2009). We agree with reviewer that in Nurra different aquifers are present and correspond mostly to different hydrogeological units. In order to satisfy most of the reviewer requests and to specify the studied aquifers, we are going to insert in the manuscript the following considerations: Within this geological frame, several hydrogeological units as

C1016

many aquifers have been distinguished by Ghiglieri et al. (2009). In particular, in the study area, the main aquifers develop (1) in a thick Jurassic carbonate sequence (corresponding to the Jurassic Aquifer proposed by Ghiglieri et al. 2009), and (2) within a carbonate and evaporitic succession of Triassic age (corresponding to the Triassic Aquifer of Ghiglieri et al. 2009). An hydrogeological unit represented by the metamorphic basement rocks is located on the west coast of Nurra district and partially acts as recharge area for the above described aquifers. Regarding the Porto Torres Basin, we do not refer to a hydrogeological basin but to a sedimentary basin, namely the Porto Torres half graben (Funedda et al. 2000). Therefore, in order to avoid any misleading, we'll replace the “Porto Torres basin” with “Porto Torres half graben” . In the map of the study area (Fig. 1), we'll also indicate the position of the Porto Torres half graben and hydrogeological basins to which we refer throughout the manuscript (ie Calich and Baratz hydrogeological basins). Furthermore, we'll revise the hydrogeological boundary of the Calich basin using the limit proposed for this basin by Ghiglieri et al. 2009. As concerns Fig. 1 and Fig. 2, therefore, we agree with the reviewer and we believe that after the corrections, the map and the related sections will be better readable.

In detail, we are going to revise the manuscript as follows:

- 1)Pg 1042, line 6. The text will be corrected as suggested by reviewer.
- 2)Pg 1042, line 10 We'll use the corrected terms for the aquifer referring to the paper of Ghiglieri et al. (2009).
- 3)Pg 1042, line 16. As suggested by the reviewer, we'll modify the text specifying with the following sentence: “brackish groundwater and water (crop out water and lake samples)”
- 4)Pg 1042, line 26. We agree that in Nurra different aquifers are present, hence we modified the text as suggested by the reviewer clarifying the hydrogeological setting of the studied area.

C1017

- 5)Pg 1043, lines 3 and 5. See comment to point 4.
- 6)Pg 1043, line 17. The text will be corrected as suggested by reviewer.
- 7)Pg 1045, line 14. In this case we does not refer to an hydrogeological basin but to a sedimentary basin, namely the Porto Torres half Graben. In order to avoid any misleading we deleted Porto Torres basin, which was evidently though as an hydrogeological basin by the reviewer. In this way, the sentence results as follow: Porto Torres half Graben.
- 8)Pg 1046, line 4. The text does not affirm that within Cretaceous host rocks are only perched aquifer.
- 9)Pg 1046, lines 8-10. See comment to point 2
- 10)Pg 1046, lines 12-14. We'll consider the Calich basin as the hydrogeological basin proposed by Ghiglieri et al. (2009) and we'll indicated it on the map of the studied area.
- 11)Pg 1046, line 19. We'll indicate the Baratz hydrogeological basin on the map and will modify its hydrogeological boundary.
- 12)Pg 1047, line 25. The text will be correct removing the "groundwater" word.
- 13)Pg 1048, line 19. As suggested by the reviewer, we'll modify the legend of Fig. 1.
- 14)Pg 1050, line 12. As suggested by the reviewer, we'll also consider the directive of the European Council concerning the quality of water intended for human consumption (Directive 98/83/EC).
- 15)Pg 1052, line 27. The aquifer will be specify according to the paper of Ghiglieri et al. (2009).
- 16)Pg 1053, line 1. We will use the corrected terms referring to paper of Ghiglieri et al. (2009).
- 17)Pg 1053, lines 9, 24, 15 and 26. See response to point 16.

C1018

18)Comments to figures: Fig. 1 – We'll erase in the map the arrows showing the groundwater flow direction. As required, the aquifers and the boundary of the hydrogeological basins will be specify referring to the paper of Ghiglieri et al. (2009). We also consider a new hydrogeological basin (the Baratz hydrogeological basin), whose limit will be redrawn.

Fig 2 – We have accepted the reviewer suggestions and therefore we'll use the same color for the geological formations of map and sections. Finally, we'll erase the groundwater flow directions reported in the sections.

Reference cited: Funedda A., Oggiano G., Pasci S. (2000) The Logudoro basin: a key area for the Tertiary tectono-sedimentary evolution of North Sardinia. *Boll. Soc. Geol. Ital.* 119, 31–38.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/10/C1016/2013/hessd-10-C1016-2013-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 1041, 2013.

C1019