**Hydrology and
Earth System
Sciences
Discussions**

Interactive comment on "The role of integrated high resolution stratigraphic and geophysic surveys for groundwater modelling" *by* S. Margiotta et al.

S. Margiotta et al.

About the interactive comment of the Anonymous Referee 1 we have some general comment:

The purpose of the paper doesn't regards the hydraulic characterization of an aquifer in a coastal areas but the modeling of the subsoil through the integration of stratigraphic and geophysics survey. Referee write that the approach used in this paper is usual for this type of study but we think that this is true only in a little part. According to Bridge (2005) and recent literature (see text line 4-8 page 2861) we think that hydrogeologists rarely incorporate information on the sedimentology of the aquifers, and

shallow geophysical methods are routinely used for aquifer characterization. This fact derive from the evidence that only rarely the stratigraphic informations are elaborated by sedimentologist or that geophysical by geophysics. Just the Brindisi area is a test of this: the identification of a new lithological formation (Brindisi sands) in that area completely modify the precedent models that doesn't considerer it since Brindisi sands are the basic part of the aquifer. About geophysical methods to hydrogeology is note that: - generally they are used to subsurface mapping and monitoring; -for esteeming the physical parameters of the subsurface they are useful as support to the numerical modelling of fluid flow and transport; Moreover is very difficult to use the geophysical survey of extended areas therefore it is used in test area or very contemplated. In the paper is underlined the importance of ERT to improve the knowledge of the subsoil of micro -area of particular interest. The main contribution of the ERT survey across resistivity parameter is to reconstruct in detail the stratigraphy improving the spatial resolution of the data and consequently the scale of observation. An other important contribute of ERT surveys could be the correlation of anomaly resistivity values with type of pollution or at phenomena associated to an anomalous groundwater flow. Is true that this approach have some limitations (described in the text). Therefore about point 4 of Referee comment is clear that in this paper geophysical researches are useful tools conducted after the construction of the groundwater model in order to better describe a test site resulted particularly interesting just by the model of flow. Geophysical informations are not used here for the construction of the model. For this reason we have chosen a calculus code MODFLOW implementation in Groundwater Vistas for the modeling that is largely used and that doesn't need of particular explanations. In this paper the model is only an application. However, according with referee comment, to fill the lack of information regarding the mod flow we could show in tables the data regarding hydraulic parameters and the calibration of the model. In conclusion, we think that hydrogeological model implementation is an important tool, probably the more important, but it is only an exercise when it is not supported by a correct (stratigraphic and geophysical in the presented paper) characterization. Accurate 2d-3d reconstructions

and maps of the subsurface are needed in hydrostratigraphy and hydrogeology. It is important to underline the scientific value of this second aspect and the paper is structured for this aim. We like to thanks Referee for his helpful and constructive comments on the submitted manuscript and for the opportunity to better define the purpose of the paper. Probably in the paper these questions need to be refine.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 5, 2859, 2008.

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Interactive Discussion

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