I like this paper because of the integration of field date and numerical groundwater modeling. The paper has two interesting aspects i) estimating the initial / current Cl distribution in a complex groundwater system and ii) using this to simulate impact of a number of climate scenarios in the system. The authors make that these two aspects go together very well.

Detailed comments

-section 2.3.3:

-This section describes how the geological model is constructed instead of discussing the hydraulic conductivity field, although both are of course highly related. How was the conversion done from geology the Kh and Kv? I have the impression that a conversion table is used: lithology x is assigned values x1 and x2 for Kh and Kv, lithology y values y1 and y2, etc. Is this the case? Where do the values of Kh and Kv originate from? What about implementation of field data in the form of aquifer tests?

- The last part of the modeled time is transient. How where values for specific elastic storage and specific yield (or storage coefficient near the water table) assigned?

-fig8: What is shown on this figure? Is it the complete dataset where values of FFa and ρt where available (both sand and clay cases) or only for clay cases? It seems to me that too few data points are present based on the description of available data given on p 6141 and 6142.

-p6149:

-A lot of effort is put in the creation of an initial Cl field and it turned out that the autonomic evolution of the model with this Cl field is judged too large considering the current boundary conditions. Can the authors comment on the reasons for that: uncertainty because interference of clay in the translation of bulk resistivity to Cl, uncertainty in boundary conditions, other reasons, …

- Now the model is run for 15 years to obtain an initial, current day, Cl distribution. After these 15 years, “numerical inaccuracies” and “irregularities” are stated to be eliminated. This is clearly based on expert judgment. Obtaining the initial (current) Cl distribution is a crucial steps in the modeling. So what do the authors see as next steps forward to decrease the uncertainty on the initial Cl distribution: more direct measurements of Cl, still better interpretation methods of geophysics, higher degree of hard data in the interpretation of geophysics, …? The authors mention this in the conclusions but perhaps this can be discussed a bit more.

- section 3.1, figure 14-17. It was state earlier that the first 95 years were calculated steady state with a stress period of 1 year. So, how do you get a summer and winter calculation here?

- p6155: What is PZH?