

Interactive comment on “Numerical understanding of regional scale water table behavior in the Guadalupe Valley aquifer, Baja California, Mexico” by J. R. Campos-Gaytan and T. Kretzschmar

T. Elliot (Editor)

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Received and published: 10 August 2006

I have included my original comments directly to the authors which have as yet not been taken up. This is a direct quotes of my original guidance.

"The paper as it stands does fall within the scope of HESSD/HESS. As required for the Access Review I provide here some technical corrections that should be made before any peer review. I also however have highlighted some recommendations that I advise the authors to consider for open peer review.

Technical corrections (no editor review required): * a thorough review of the written English used (both general vocabulary and style, as well as technical terms). If possible,

please use a native speaker to look the manuscript over; * capitalise the word 'State' when using it in context of the 'State of Baja California' (alternatively say 'Baja California instead of State'); * a clearer, more structured distinction in the text between review sections of available information regarding geological/geographical setting hydrogeology and the justified specific implementation and chosen model approach (eg. details of discretisation of BC's and IC's); * use and uses of consistent and common units; eg 900km² (p.3) is areal not length ? * use of terms such as "highly permeable", "relatively impermeable", "impervious" (p.4), "impermeable" (p.5), and other relative descriptors should always be qualified; * the use of the term "pervious/impervious" should relate to porosity issues; the terms "permeable/impermeable" to interconnected porosity issues (affecting eg flow); * locations of precipitation stations could be shown on map Figure; * what is "(cte)" in Fig. 7 ? : * where are the "set of parameters" for a 'best fit' summarised ?; * if Fig.9 is a best fit run then this should be stated in caption; * avoiding waffle and repetition in discussion; model results were not really discussed in any detail (just described in results, eg p.9 recharge yield results simply mimic Table 1 data, and then are not then actually discussed as to their significance); * Fig. 1, "Gulf" rather than "Golf"; * Fig.3 "projected" rather than "proyected" ? In Figures we have 'El Porvenir' and 'Calafia' Sections but these are hardly used in the text ? * On Figures with map coordinates the authors should show latitudinal degrees as Nor S and longitudinal as E or W.

Although not a formal review of the paper at this stage, the authors might also consider as specific recommendations and guidance: * on p.4 we are told that "Despite the fact that the aquifer is vertically heterogeneous, its regional properties suggest it can be considered as a single system", with little evidence for either parts of that statement. * more detail on how precipitation data (3 stations) was processed (corrections/weighting applied for station elevation/representative areas ?) and how effective recharge and runoff estimates are made (eg ET issues); moreover why are precipitation data post-1983 (1983-2003) used if the simulation is matched against 1983 WT elevations ?; more detailed reasoning for locations of no-flow boundaries and mountain

front recharge areas (how defined) ... and also the idea and how in particular model parameters can be specified by “borrowing values from similar watersheds ... previously calibrated”.; * if the watershed is outside the model domain (Fig.4), then how is the flux specified eg for mountain recharge; * how is Freyberg (1988) a “similar study” (p.9) ? * more detail on calibration process and sensitivity ranges of applied parameters - the authors might like to comment also on eg the apparent orthogonal crossing of observed vs. simulated piezometry in the NE of the model (Fig. 9) as this pertains to checking the conceptual model; * how sensitive is the model to projected faults (Fig.3) ?; * results of a model validation run (rather than simply calibration); and * a more detailed reasoning for why in particular 1983 data was chosen to represent steady-state conditions in the aquifer (is this pre-development ? cf p.2 where historic piezometric data from 1967 to 1997 suggest cyclical variations in storage capacity); * how do you check the hydrogeological conceptual model (eg what estimates of input-output were suggested conceptually against model response ?).

And other more general recommendations and guidance: Simplified steady-state numerical studies of groundwater flow system can be insightful and useful to gain a better understanding of relevant key parameters in given models. However, the authors tend to simply describe their model rather than explain and justify its development and significance. For example, the “Model Description” section is both general and standard in textbooks and adds nothing of insight to the model development. There is little discussion eg of the sensitivity of the model structure (to such features as projected faults) or how it modifies/is modified by comparison with the conceptual model. Of some further concern is that the title does not seem to match the paper contents. Since transient simulations are not run, the idea that the paper is presenting a model which shows “numerical understanding of regional scale water table behaviour ... [my emphasis]” does not seem to be the current paper’s focus (just a prelude ?). Moreover the significance of the work may need addressing more strongly to be of interest to the breadth of HESS readership. What needs to be brought out is how the study illustrates perhaps some methodological development or new approach, or answers some scientific ques-

tion of broader interest. That this is “ ... a hydrogeological model which summarise the status of knowledge of the study area.” is not of itself necessarily a criterion of broader interest over just local concern (although obviously locally important). For HESS readership, do we need to know now these first steps (final sentence in Conclusions) - or what do we need to know of general interest from this work ?”

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 707, 2006.

HESSD

3, S674–S677, 2006

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