**Hydrology and
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Discussions

Interactive comment on "Modeling the effects of cold front passages on the heat fluxes and thermal structure of a tropical hydroelectric reservoir" *by* M. P. Curtarelli et al.

M. Hipsey (Editor)

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Dear Authors

I have read through the paper and have been following the comments and replies. I think there has been some good points made and in particular Referee 4 has echoed some of the big picture issues that I also felt need to be addressed. Really the aim of the paper in its current form is to run an off-the-shelf model on a specific reservoir, as pointed out by R#3. From my point of view HESS is not a modelling journal per se and we really want to see the models applied with extra thought given to gain insights into

new dynamics, something that is transferable in a generic sense.

This is highlighted in your comment stating the "main contribution of our research was to improve knowledge about the effect of cold front passages on spatial heterogeneity of thermal regimes in Itumbiara reservoir" - from this I am immediately asking two issues: a) what new knowledge specifically (bearing in mind a rich literature on mixing in stratified lakes) ?, and b) how is the knowledge transferable beyond Itumbiara to other readers? I urge the authors to therefore consider some of the reanalysis options suggested by R#4 as a means to deal with these issues and put in context by strengthening the scientific argument in the introduction - what knowledge gap are you filling?

On a further point: regarding the "Results and Discussion" section. My feeling here is having 7 sub-headings in one combined results and discussion section does not help the paper, and may in fact be a symptom of the above problem. My suggestion is the results and discussion should be treated separately with a dedicated discussion aiming to provide the more general outcomes.

A final point, regarding atmospheric stability, I was left wondering why you explained the bulk transfer equations in full detail, but then did not described the similarity functions for non-neutral conditions? Also is it worth including a line-plot showing "z/L" on the top of Figure 5? Especially since you later stated that it was predominatly unstable. I also note the model is cooling too quickly in Figure 4 - can this be improved?

Best Regards

Matt