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Geoscientific Model Development Discussions

Interactive comment on "A Conceptual Framework for Integration Development of GSFLOW Model: Concerns and Issues Identified and Addressed for Model Development Efficiency" *by* Chao Chen et al.

Anonymous Referee #3

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After reading the entire paper, I found there are serious fundamental flaws in the organization and perhaps the key concepts of this paper, as I will detail below. Therefore, I cannot recommend the publication of this paper.

Regarding the structure of this paper, the following serious shortcoming can be clearly seen -

1. The "Modeling Results" of this study, which is supposed to be the most important, is only one paragraph in Section 4.3.

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2. In contrast, too many general statements written in a very lengthy way. For example, in Section 3.2 the three key data linkages are all common knowledge which i am sure most researchers are well aware of these basic processes. There is really not worthwhile to spend so many pages in explaining them while the important Result section is kept minimal.

(Note that A paragraph in Section 3.3 is 31 lines long. It is very tough for any readers to follow.)

3. There are only three Figures - two of them were borrowed from another paper. The remaining one figure is also not related to the results of this paper. There are two Tables, but I cannot see why they are necessary to be presented. Why and how can there are no figures/tables at all on the modeling results?

4. Too many long and repeated sentences which make super long paragraphs over and over. For example, a paragraph in Section 3.3 is 31 lines long. It is very tough for any readers.

As one key achievement and conclusion of this study, the authors stated that (P12, L12-14) in Section 4.3 “Modeling Results” (which is way too short !! only one paragraph, 14 lines for the results!)

“the MODFLOW development playing a componential role in the integrated system turns out successful, as the transition from an independent model to a system component was smooth, efficiently, and effectively.

But, I do not think the authors have demonstrated what they said in this sentence at all. What does those adjectives "smooth, efficiently, and effectively" really mean? It is very vague, and, how to measure them? also they are "smooth, efficient, and effectively" relative to which previous modeling systems?

Regarding the key concepts, I cannot agree that all the contents in Section 3.1 are true. All these statements are too general rather than being specific for the certain situation. I

think the authors were promoting the dynamic coupling between surface water systems and groundwater system, for example, they stated "... such structure connection needs to be externally defined....". However, I cannot fully agree. I believe in some situations, a data transfer (e.g. groundwater recharge) simulated from one model passing to the other can well suit the situation without interaction. It really depends on the hydrologic settings, but it was pity that the authors did not spell out the entire picture, i..e, when the fully interactive coupling is necessary, and if the coupling is necessary, how to take care of water balance issues in two coupled models to conserve water? All of these key issues seem like not being focused in this paper.

Finally, there are also many editorial revisions required to be made throughout the entire manuscript. I summarize some obvious ones below for the authors' reference.

Editorial Comments -

P2 L22: Revise –

"in the to-be coupled models make uniqueness in the coupling procedures. . ."

Into -

"in the models to be coupled make uniqueness in the coupling procedures. . ."

P2 L23, L24: Revise –

"However, there is very few studies are available focusing on the model development procedures of integration processes of these integrated models,. . ."

Into -

"However, there is very few studies available focusing on the model development procedures of these integrated models,. . ."

P2 L26: Revise –

"with principal concerns and issues addressed, from perspectives of:. . ."

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into -

“with the principal concerns and issues addressed, from the perspectives of. . .”

P4 L24-25: Revise “when for separate studies” P5 L22: Revise the entire sentences of “scale and use PRMS simulation gravity drainage to saves considerable efforts and time resulting a speed. . .”. Some grammar errors here, and not easy to understand.

P6 L2: Revise the wording “deep ET portion” by referring to the process instead of shallow or deep. P6 L7: Revise the entire sentence here. It does not read like a sentence to start with “While”.

P6 L9: Revise “switches from by PRMS to MODFLOW” P6 L28: Revise “Typical groundwater MODFLOW model simulation requires an initial. . .”

P6 L33-34 Revise “after the fulfillment shallow soil-water flow. . ..”. What is “value scale”? You mean the “magnitude”?

P12 L17: Revise “5E-2 m/d” since it was seldom written in this way for any papers.

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