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 #1

Received and published: 22 December 2018

The presented study promises a "conceptual framework from perspectives of: Model Conceptualization, Data Linkages and Transference, Model Calibration, and Sensitivity Analysis" for an existing model GSFLOW. GSFLOW is a model developed by the USGS, which couples two existing models: PRMS and MODFLOW. The framework is intended to improve GSFLOW model development efficiency and help the interpretation of simulation results.

It is not clear how the presented study adds information to the community not already available in the USGS documentation of the used model frameworks. The authors

claim that they present a conceptual integration framework which is only outlined by one figure. It is unclear what a conceptual integration framework constitutes and why it entails benefits for the interpretation of simulation results yet alone model development efficiency.

The presented study builds on already available code and does not present any new information about the GSFLOW model. A structured guideline for modelers would help the community to implement these kinds of models and is promised by the authors but not presented in any way in the paper. The presented study presents a tutorial that could be uploaded to a publication platform like github to provide an example study for the community but does not fit the requirements for a GMD development and technical paper. No insides to technical aspects to running models or reproducibility of results are presented. The GMD guidelines state that: "Development and technical papers usually include a significant amount of evaluation against standard benchmarks, observations, and/or other model output as appropriate." The presented model of the Lehman Creek watershed was already described in a different publication and does not add any of the evaluation mentioned above. It would be appropriate if the authors used the model to show how the transition from an independent model to the integrated model is supported by their "framework". At this point I cannot see any evidence of a detailed evaluation or discussion on this topic. The shown figures are adapted from a previous publication and do not add any valuable information in evaluating the proposed framework. Additionally, these figures do not meet the standards for a GMD publication.

Additional remarks: - Unclear use of language, missing articles or wrong use of plural - Units do not follow journal guidelines - Figures text is not aligned and partially unreadable (e.g. Fig 2b))