Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., referee comment RC1
https://doi.org/10.5194/gmd-2021-409-RC1, 2022


# Comment on gmd-2021-409

Anonymous Referee #1

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Referee comment on "Inland lake temperature initialization via coupled cycling with atmospheric data assimilation" by Stanley G. Benjamin et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-409-RC1, 2022

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This manuscript investigates a very important question of coupling lake to weather model. it is an important challenges for local predictions. in that sense, this study is an important one. I however do not support the publication of the current version of this manuscript for the following reasons:

- It is very difficult to follow the scientific content of the paper. The manuscript seems to be very well suited for an internal report - where readers already know about the models details - and less to a scientific manuscript. The manuscript has to be profondly revised. I do not see how other research group can benefit from this study with the current layout. I need much more technical details for a paper in GMD. Note that I am not questionning the quality of the work here.
- litterature review. The litterature review missed many important contributions on the two way coupling lake atmosphere exchanges. I have added a non exhaustive list: I was surprised to not see references to COSMO/FLAKE (http://www.borenv.ne t/BER/archive/pdfs/ber15/ber15-218.pdf **, http://www.cosmo-model.org/content/model/modules/flake/**), Simstrat (https://doi.org/10.1038/s41598-021-04061-6), CRCM (https://doi.org/10.1080/07055900.2000.9649657 ) etc
- Figures. I do not see the added values of most figures showing maps of North America. Figures looks more like print screens than carefully designed visual information
- L37 "errors in lake temperature from as much as 5-10K " I am not aware of any model with such range of error. This error range does not make sense.
- L86 "However, lake temperature initialization is still a problem. " It is not clear why it is a problem. 1-D models are fast to run and can easily be run for long period with no memory from the initial conditions.
- I question the reproducibility of this study. The authors do not provide their codes/working examples. Again, I do not see how other research group can benefit from this study. This study is not FAIR-compliant and do not make a contribution valid

for GMD in the present form