

Geosci. Model Dev. Discuss., author comment AC1  
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## Comment on gmd-2021-409

Stanley G. Benjamin et al.

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Author 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-AC1>, 2022

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Thanks to Jack Settelaier (US) for a review of our lake initialization paper.

Responses are shown below as bullets and in italics.

It's great to read of such a reduction in errors, from 5-10K to 1-2K. I've seen how lakes often stand out in some of the NWP-based output for our NWS use (e.g. NBM). It's interesting, as well, that some of our lakes dry up to some degree in Texas and the Southwest.

- *Thanks for your NWS perspective. We appreciate very much your very helpful suggestions.*

I'm sure you know, but I'm staring at 1-d use, vs 1-D. Is former really correct?

- *We couldn't find a preferred style for GMD in this area, so we used 1-d consistently and presumed that could be corrected later if needed by the technical editor.*

Line 128 (small-lake) vs 137 (small lake)

- *You are right – we added hyphens to 'inland-small-lake' on line 137 since it is a compound modifier (adjective) when hyphens are appropriate.*

Line 177 "lake cycling" I'm unfamiliar with, but I assume it's the thermal turning over of the lake water. Maybe add a quick definition?

- *We have now defined the phrase, "lake cycling", back on line 118 in the context of lake and lake evolution forced by ongoing atmospheric fields.*

Line 202 first to mention HRRRv3 rather than just HRRR?

- *We added a reference to a list of HRRR versions in that same caption. We hope that's enough.*

Line 244 FVCOM. How does that relate/differ from FV3 I see more referenced these days?

- *FVCOM, a 3-d water hydrodynamic model, has no relationship to the FV3 3-d atmospheric model now being used increasingly for NOAA weather models. Both of them happen to use the 'finite-volume' modeling technique (which is why 'FV' is in both names), which is used by dozens of different fluid dynamic models.*

Line 256 I suppose it's also proper to be specific about Laurentian Great Lakes vs Great Lakes.

- *Right, thanks for bringing this up, and yes, especially with the international readership for GMD, it's important to be specific on Laurentian Great Lakes, and we had tried to do that throughout the paper including on line 256.*

Line 279 "20 s" vs 20s vs 20 sec

- *We think that we used the correct notation, '20 s', according to the GMD manuscript composition guidelines. Thanks for getting us to check again.*

Line 293 Was GLOFS defined before this mention?

- *No, GLOFS had not been mentioned before.*

Line 299 I had no idea there was 15" (inch?) MODIS data?! Wow.

- *The MODIS 15" data uses the degree/minute/second spatial notation, i.e., ~111km, ~2km, 0.03km. So, 15" means about 0.5 km.*

Line 323 "ocean-contiguity" new for me. Meaning connected water?

- *Yes, it means connected water areas.*

Line 332 "25-m" but above in 279 you use "20 s" Is that proper? Adjective vs noun I presume

- *We discovered that the GMD guidelines indicates their 'house rules' is to not hyphenate modifiers. So, '2-m' modifiers have been changed to '2 m' throughout the manuscript.*

Line 422 pseudo-innovations (new term to me; despite reference, maybe worth a line of description?)

- *To define 'pseudo-innovations', we expanded the parenthetical expression to this: 'James and Benjamin, 2017, meaning estimated observation-background forecast differences but not actual'. Given that this is a lake-modeling GMD issue, we'd rather not try to go further than that. Yes, really inquisitive readers will have to go to the reference.*

Line 485-489 Fig 7 You nicely define the difference between HRRRv3 (NCEP Oper) and HRRRv4 (HRRRx), however you do so AFTER you already have a like caption in Figure 6 where that detail is not defined (Line 454-456).

- *We have changed this caption to refer solely to HRRRv3 vs. HRRRv4 corresponding to the versions without and with the lake cycling.*

Also, I see you spell out "Figure 6." in line 454, vs "Fig. 7." in line 485

- *Figure 7 is now spelled out – thanks.*

Line 505 and 514 I see the way you have linked the two Tables using the "No. from Tab. 5" column in Table 6, when it seems it would just as easy to reference Table 5's Lake Number column?

- *We were just trying to help some readers to refer back more easily to Table 5 with this column in Table 6.*

Bottom-right image of Page 22, has a spurious? little "Plot Area" overlay on the Lake Tahoe chart?

- *Fixed – thanks.*

Line 605 "the lake depth for most lakes is too deep" Should that be "the HRRR-CLM simulated environment lake depth...."?

- *Good point. Language wording was changed to this with new wording underlined below: "On the average, the current specified values for mean lake depth for most lakes is too deep compared to reality, since the preprocessing with the K12 dataset simply assigned a single lake depth value (maximum or mean) to all grid points for that lake even up to the modeled lake points adjacent to land, as shown in Table 5 for 16 or the 19 lakes studied."*

Line 624 (D22, J22) refers to?

- *Those refer to Dowell et al 2022 and James et al 2022, and those abbreviations are now defined back on lines ~157-158*

Line 663, 669 "US NWS" and "US NOAA" Maybe the former could be "US NOAA NWS?"

- *We preferred to call the forecasters from NWS but use 'NOAA' only for the model since it was developed by NOAA including parts outside of NWS.*

Line 685-690 Will those author references remain as initials?

- *Yes – that is the suggested convention for this author contributions section and readers can figure out very easily who is who.*