

Geosci. Model Dev. Discuss., author comment AC1  
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## Reply on RC1

Nicolas Azaña Schnedler-Meyer et al.

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Author comment on "Water Ecosystems Tool (WET) 1.0 – a new generation of flexible aquatic ecosystem model" by Nicolas Azaña Schnedler-Meyer et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-366-AC1>, 2022

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Dear Referee #1

Thank you for your support of the manuscript and your insights into how it may be improved!

We have considered your questions and will reply to these individually below. With regards to smaller comments not specifically mentioned below, we have generally followed your suggestions.

### First comment:

While we realize that this was not clearly stated anywhere in the manuscript, comprehensive documentation on how to download and compile WET is available from the WET website at [wet.au.dk](http://wet.au.dk) under 'for developers'. We have highlighted this fact in the code availability section of the manuscript, and will refer to this guide in the README.txt file as well. Regarding model usability, we have revised the description of QWET (i.e. the graphical user interface for the GOTM-WET model complex) to reflect that a tool is available for model users to ease model configuration and execution (see line 66).

### Second comment:

We might have presented the wrong impression here, by implying that there is a tested workflow for doing this. Unfortunately, this is indeed an area where the researcher must make use of their own judgement. We tried to allude to these thoughts in section 5, lines 354-358. We have changed line 94-95 to be more precise, and improved on the discussion of this aspect in section 5, lines 369-376.

### Third comment:

There is as of yet no comprehensive unit testing suite available for WET. WET is currently

maintained and developed by a small team of researchers, and our resources do unfortunately not cover this. Thus, users must be prepared to check their results for unexpected or erroneous behaviors, and are encouraged to post any concerns as e.g. support questions on the gitlab website. However, as WET is built for the FABM framework, it does benefit from the excellent error handling within FABM. In addition, some tools for e.g. stress-testing models are available for the FABM framework, but their description is unfortunately beyond the scope of this manuscript.

***L268: what does "Each water layer included a sediment layer of 10 cm" mean? Please illustrate.***

In this case, this is a feature of the lake GOTM's hypsograph setup. In order to capture lake sediment-water column interactions at all depths, the bottom is effectively split up, such that each model layer in the 1D setup has an attached bottom layer. Interactions between the water column of a layer, its attached bottom, and the water column layer below is governed by the hypsograph, which specifies the fraction of the bottom area to total layer area. We have added this short description to the section, and included a reference which contains a further description of the hypsograph.

We would however like to avoid tying the mind of the reader too tightly to the chosen physical model used, as WET can in principle be utilized with a variety of physical models, and so we would prefer to avoid a figure of the hypsograph setup in this manuscript.

***L279: Are boundary conditions only set at surface layer or all water layers? If the latter, how the inflow are distributed across different layers?***

We have specified that both in- and outflow was applied in the top layer.

***L284: In Chen et al. (2020), ACPy was said to be used for calibration. What is the relationship between ACPy and parsac?***

ACPy is identical to the Parsac package, except for the name, which has been changed in the meantime.

***L306: runs at a lower resolution?***

We are unsure what you mean here, but to clarify, we ran the model at higher resolution, in order to increase detail on e.g. the vertical movement dynamics.

***L336: Section 5 needs to be divided into several sub-sections, for example model performance, model limitation and future work.***

We have separated this section into four sub-sections.