Comment on gmd-2021-366

Anonymous Referee #1

Referee 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-RC1, 2022

Schnedler-Meyer et al. introduced an open source, highly customizable aquatic ecosystem model, the Water Ecosystems Tool (WET), in this work. The WET model is developed based on the FABM-PCLake aquatic ecosystem model framework but has several advantages, including that this new tool is extensively modularized, empowering users and with flexibility of food web configurations and has new features of nitrogen fixation and vertical migration. The manuscript is well writen and easy to follow. I want to thank the authors for it. In my view, this work deserves to be published because it has the potential to help fill the gap between scientific findings and pratical applications in aquatic sicence. However, there are several outstanding questions to be addressed before acceptance.

First, to make the tool useful for broad users, it should be easy to deploy and configure. However, for many open-source tools, the developers focus on more on development but documentation. It is understandable for those new developments. But for a tool that is built on a mature model framework, I did not expect it. I downloaded the source code and test case from the provided link. However, there are none of documentations in the folder that teach the users how to compile and configure. I typed "make" in the folder but cannot compile WET successfully. For most of the users, they will give up after this first attempt. It is unfortunate for a tool that can benefit the society.

Second, the authors stated that WET can be used to test for the optimal food web configuration in a specific case. But they have very limited discussions about it. For example, how should we distinguish the effect of model calibration and module settings in the situation that both can improve the model performance? As a complex model presented here, there may be tens of different modules. Each module may have more than ten parameters. Under such complex situations, the optimal food web configuration is easily said by done. So I want to hear some insights from the authors.

Third, does WET have any unit testing features? As the tool is extensively modulized and supposed to be under community development, unit testing would be a key procesure to ensure software quality.

Specific Comments:

L53: supports

L122-124: Please split this sentence which is too complex.

L166: should be "never limit"

L197-199: please split this sentence. It is too complex.

L245: remove "most"

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

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

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

L398: "try to" not "try"

L306: runs at a lower resolution?

L309: that contains

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

L381: "improve" not "improving"