

Interactive comment on “The Ensemble Framework For Flash Flood Forecasting (EF5) v1.2: Description and Case Study” by Zachary L. Flamig et al.

Anonymous Referee #2

Received and published: 8 July 2020

This manuscript describes the EF5 that allows to produce hydrological runoff outputs (e.g., discharge) by i) adapting different inputs for precipitation (e.g. from multi-radar multi-sensor MRMS for the presented case over the CONUS) and ii) combining (as an “ensemble” of) existing algorithms of snow melt (not presented details here), water balance, routing, and calibration (not used in the presented case).

The method (Section 2) focuses on details mostly three water balance models and routing parts of EF5 and case analyses for the evaluation (Section 3), which were parts of the author’s Ph.D. dissertation published in 2016 with Open Access: <https://shareok.org/handle/11244/44865>, e.g., Chapter 3 and some parts in Chapter 2

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with major duplications of figures, texts and the presented cases.

The submission of theses (unpublished yet to another peer-review journal) is in general encouraged. However, I found the method and evaluation of EF5 presented here is not sufficient to fulfill the key scope of GMD (e.g. reproducibility of the work). Here, this reproducibility is very briefly mentioned in summary and future section; e.g., implementations for flash flood forecasting within the FLAHS project (cited briefly in P22, L3-4; Gourley et al. 2017) and at Namibia (P21, L9-10; Clark et al. 2017). However, it should be better addressed by adding discussions and implemented case summaries in this manuscript as well. So, I do not recommend its publication without a major revision considering following points that may help the manuscript to be more interesting and updated. (Note: P- page, L- line number in each page)

1. The code uploaded in the provided link (<https://github.com/HyDROSLab/EF5>, Flamig, Z. L., Vergara, H., Clark, III, R., Hong, Y., and Gourley, J. J.: EF5: Version 1.0, doi:10.5281/zenodo.59123, <http://dx.doi.org/10.5281/zenodo.59123>, 2016) is indeed v1.0 not v1.2 that is indicated in the title. If there is any update in the code and manual, please comment them in the text. Also, I found the following version by the same author but under the name of “training”, would this example can be presented in this paper as well? Zac Flamig. (2018, March 13). HyDROSLab/EF5: More bug fixes. (Version v1.2.3). Zenodo. <http://doi.org/10.5281/zenodo.1197006> The manual exists in Latex file but pdf can be also appreciated.
2. Although the name of the model contains “for flash flood forecasting” and the abstract says “the results of the study show that the three uncalibrated water balance models linked to kinematic wave routing are skillful in streamflow prediction”, the presented method and analyses hardly contain any predicted outputs ahead in time. The evaluation is also done only in terms of the discharge assessment (every 5 minutes at USGS gauge points in near real time precipitation forcing). Abstract should reflect better what has been presented in this work. Adding more examples from the implementational works including detail limitations will also make the manuscript more solid;

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e.g., P6 L2-3 and P13 L17-19 given that EF5 is now operational over CONUS.

3. It is not clear that how important adding “Snow (melt) component” in EF5; this seems a newly added feature to EF5 (introduction e.g., P4, L5-7), yet the detail background/examples were not presented in the method. Also, the interpretation of the presented cases (P19, L22-24 linked to the not-used “snow module”) needs more solid evidences. What kind of caution (or a priori parameter development as mentioned in P22, L10) should be considered by the users? Please explain more explicitly.

Minor comments

1. The reference link was broken - Flamig, Z. L., Vergara, H., Clark, III, R., Hong, Y., and Gourley, J. J.: EF5: Version 1.0, doi:10.5281/zenodo.59123, <http://dx.doi.org/10.5281/zenodo.59123>, 2016.
2. Some acronyms need to be better informed: e.g., P13, KW, NED, P14 GAMLSS
3. Table1, fix parameters the same as written in P9, IWU has no unit? Check units in other tables as well.
4. P6, 20-22: add reference or provide evidence.
5. P20, L1-3, L4-5, L8, P21 L1-2: Need better explanations.
6. P22, L2-4: Provide more clear explanation and supporting materials in the results.
7. P22, L15-16, It is not clearly written. Revise the sentence.

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2020-46>, 2020.

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