

## ***Interactive comment on “Using R in hydrology: a review of recent developments and future directions” by Louise J. Slater et al.***

### **Anonymous Referee #2**

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I enjoyed reading this paper, which is for sure useful to get an overview on what R can do for hydrologists and what hydrologists can do for R. I am an R user, and I have also developed packages, which places me at one side of the spectrum of potential readers of this paper. As such, I can benefit a lot from the information provided, especially regarding tools on subjects I am not an expert in. I wonder whether the great amount of information provided in the paper isn't overwhelming for a R beginner. It is unlikely that a R beginner will comment the paper in this discussion stage so, if I were one of the Authors, I would suggest to ask, e.g., a couple of master or starting PhD students to perform an internal review of the paper as non-expert readers (that's just an idea).

Besides the many advantages of using R (and open data and software in general), I would have expected a mention on possible drawbacks. A couple of examples follow:

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- The easy accessibility and usability of open tools results, sometimes, in applications without critical scrutiny on what one does. It happened to me to receive an email from a user of my package asking me to tell her/him how to apply the methods to her/his data. A few months later I've been asked to review the paper written by the same R user who, then I realised, had no clue about the meaning of the methods applied. In other words, how can the misuse of software be reduced within the open source community? (I am aware that this happens also with proprietary software).

- Everybody can make an R package available, even if not carefully tested. This may result in errors that are then propagated by users. That happened to me too. I had a bug in my code but, thanks to the open source, a user spotted the error and I could correct it. When my package was first published, I received several feedback messages that helped me a lot to clean the code. The frequency has then decreased considerably meaning that, hopefully, the main errors have been solved (or that people do not use the package any more :-)

Having said this, I believe the paper is good and worth publishing in HESS, maybe after a minor revision.

Small things:

Page 2, line 31: I would mention here more specifically what R is, or better what R was, i.e., software for statistics (you say that in section 2.3). This is to better inform the non-expert reader.

Figure 1: I am not a big fan of this kind of figures in review papers. The text describing it could be sufficient.

Page 5, line 18: I would say here that hydrologic research is criticized for the lack of reproducibility, rather than scientific research in general.

Page 7, line 14: Maybe it is just the way I call things, but I would say that C and Fortran are very efficient in performing loop tasks. R, Matlab etc. are very good in vector

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operations.

Section 2.5: Just as a note, which may be ignored by the authors if not relevant, IAHS also organises R courses in its meetings, e.g., there will be a “Using R in Hydrology” workshop at the IUGG2019 conference in Montreal. Also, among others, the PUB summer course [https://www.waterresources.at/index.php?id=5&tx\\_ttnews%5Btt\\_news%5D=42&cHash=1f78fb6f0a0bf08ca5593890cc294f84](https://www.waterresources.at/index.php?id=5&tx_ttnews%5Btt_news%5D=42&cHash=1f78fb6f0a0bf08ca5593890cc294f84) uses R intensively.

Page 10, line 16: I would not use Twitter to discover packages, but to be exposed to communications about new packages or new features.

Page 12, line 24: I normally use RgoogleMaps <https://cran.r-project.org/web/packages/RgoogleMaps/index.html> to interact with Google Maps.

Page 13, line 15: Actually also TUWmodel can be used in a semi-distributed fashion, allowing for differentiating into elevation zones. Page 14, line 19: For regional frequency analysis I would also mention the ImomRFA package <https://cran.r-project.org/web/packages/ImomRFA/index.html> developed by the very father of the L-moment methodology J. R. M. Hosking.

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