Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2020-133-RC1, 2020

Hydrology and Earth System Sciences
Discussions
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Interactive comment on "A hydrological framework for persistent river pools in semi-arid environments" *by* Sarah A. Bourke et al.

Anonymous Referee #1

Received and published: 9 June 2020

The manuscript "A hydrological framework for persistent river pools in semi-arid environments" by Bourke, Shanafield, Hedley, and Dogramaci, attempts to present a framework of four hydrogeological categories for "persistent river pools" supposedly based on the study of 22 pools in otherwise ephemeral or intermittent streams in the Hamersley Basin of NW Western Australia. The manuscript states that of the numerous pools in this area (attested to by a Geodata Topo 250K Series 3 data set as "waterholes" shown in their Fig. 1), 22 were examined in detail. However, almost no data is presented pertaining to this supposed investigation of the 22 pools. Three poor quality data graphs are tacked on at the end of the paper, appearing as an after-thought, and are discussed very briefly in two paragraphs. The reader assumes that this "data" is from one or a few of the 22 pools supposedly studied. The bulk of the manuscript can be described

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Discussion paper

as introductory and speculative. Except for these three graphs (in Figures 7, 8, and 9) and summary descriptions of the four different categories in Table 1, no other “data” is presented. Thus, there is very little content presented in this manuscript. For these reasons, this manuscript is disappointing and poor scholarship. As is, the manuscript attempts to make the case for a hydrogeological division of persistent streams in arid-semi-arid areas, but provide no case studies. This manuscript cannot be considered a review paper of previous work on such pools because it does not come anywhere close to presenting that kind of literature survey. What the manuscript does do at length in the discussion is to advise and suggest ways to make progress in the area of identifying persistent pools in the system presented. The manuscript has laid out a case for the division and done the introductory work, however, as already stated in this review, there is almost no actual data on actual pools. What is needed are details of the pools said to be studied in detail with hydrogeological cross-sections and environmental tracer data which sets out the argument as to why the pool categorization presented is sound.

In my opinion HESS should not have sent this manuscript out for review. It should have been rejected by the editor/associate editors. I reject it without equivocation.

In summary, if there were a series of well documented case studies of these “persistent pools” with hydrogeological and environmental tracer data from the Hamersley area from which a hydrogeological framework can be based on, then this material should have been the focus of the manuscript. Finally, I note that there is a 2012 Journal of Hydrology paper by one of the co-authors (Dogramaci et al., 2012, J. of Hydrology 475, 281-293) which has environmental tracer data from many of the pools depicted in Fig. 1 (from the Bourke et al. manuscript). However, this data is not discussed or mentioned nor is this paper referenced. Again, poor scholarship.

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