Final Response : A Global High-Resolution Hydrological Model to Simulate the Dynamics of Surface Liquid Reservoirs: Application on Mars

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Referee comments on "A Global High-Resolution Hydrological Model to Simulate the Dynamics of Surface Liquid Reservoirs: Application on Mars" by A. Gauvain et al., Geoscientific Model Development Discussions., https://egusphere.copernicus.org/preprints/2025/egusphere-2025-4992/#discussions.

Referee comments are shown in black. *Our responses are in blue italic.*

1 RC1: "Comment on egusphere-2025-4992", Kerry Callaghan, 03 May 2026

Technical corrections:

The authors have responded to all comments and have done well to clarify a number of aspects of their work in the updated manuscript, and I am recommending acceptance for publication. I have only one remaining, very minor comment: while I deeply appreciate the interesting application of this model and the plans for future expansion and coupling with GCMs, I am mildly concerned with the framing in line 64 of it as a "new *type* of hydrological model" (emphasis mine). Although it is both a new implementation and a new application of a model, I would not agree with characterization of this as a new type of model, especially given that it is strongly based on an existing model (FSM). Overall, thank you for sharing this interesting work!

*Thank you for your positive assessment of our work and for this comment. We agree that the wording "new *type* of hydrological model" was too strong and could be misleading given that our framework is strongly based on the existing FSM approach.*

Following your suggestion, we have changed the sentence to: "This paper presents a global high-resolution hydrological model based on the depression hierarchy concept and fill-spill-merge algorithm introduced by Barnes et al. (2020, 2021)."