

## **REVIEW: MATILDA-Online v1.0.1: A Cloud-based Open-Source Workflow for Modeling Water Resources in Glacierized Catchments**

### **GENERAL COMMENTS**

The authors present MATILDA-Online v1.0.1 as a useful tool for Global South countries (which, according to the authors, have limited institutional experience in hydrological modeling) whose water availability is heavily dependent on the cryosphere. However, the first premise is not only poorly substantiated but also contradicts empirical evidence. Furthermore, due to its lumped nature, the proposed model is unfeasible for large mountain ranges (with massive altitudinal gradients) such as the Andes and the Himalayas—regions with dense populations that rely heavily on snow and glacier melt. In its current form, the manuscript should be rejected because it presents an inherent contradiction (*aporia*): while the model could be valuable in educational settings, its technical characteristics prevent it from fulfilling the authors' own presupposition of being applicable to decision-making in Global South countries. My specific arguments are detailed below:

**L36-L42.** The authors argue that in the Global South (which includes, for instance, South America and China), very few models are used on a regular basis; however, they provide no evidence to support this claim. Countries like China lead global scientific and technological output, and in South America, there is an extensive scientific literature documenting the implementation and development of hydrological models within academia, along with practical applications and knowledge transfer to decision-makers (e.g., Ayala et al., 2020; Caro et al., 2025; Carrillo-Rojas et al., 2019; Murillo et al., 2022; Poveda et al., 2007; Toum et al., 2025—among many others). In the case of the world's longest mountain range, the Andes, where the cryosphere plays a fundamental role in water availability (Masiokas et al., 2020; Saavedra et al., 2026), there is even an organized and consolidated community that connects science, universities, and decision-makers called ANDEX (<https://www.andex-rhp.org/>, which belongs to GEWEX and WCRP).

The standpoint adopted by the authors regarding the potential users of their proposed model (referring to themselves as "the international scientific community"; L36 "...the international scientific community may assist in compensating for this.") is somewhat WEIRD. The arguments written in this direction sharply contrast with empirical reality: Is science only conducted in Western Europe and North America (~12% of the world's population)? Do these countries alone represent the international scientific community? Are there no universities, research centers, or technical institutions dedicated to water management in the rest of the world? I believe anyone with a basic education would agree that ~88% of the world's population represents an overwhelming majority, making

it highly probable that these countries harbor institutions dedicated to the study and application of hydrology, including the development and use of numerical models. The references cited by the authors denote a complete lack of awareness regarding the bibliographic material published in international journals (e.g., HESS) by authors and institutions from the Global South.

In the section “5.1 Spatial Aggregation,” the authors acknowledge that the model is lumped by nature and, consequently, does not adequately represent snow accumulation and melt gradients. If the model is intended for users (whether in academia, technical roles, or decision-making positions) in the Global South, how useful can a model be if it cannot accurately simulate snow accumulation and melt in critical mountain ranges like the Andes or the Himalayas? In these regions, water availability depends heavily on snowpack (Masiokas et al., 2020; Saavedra et al., 2026; Viviroli et al., 2020; 2026).

### **REFs**

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