

Waeber, E. L., Wankmüller, F. J. P., Di Bert, S., and Carminati, A.: Plant Effective Conductance Fails to Predict Soil–Plant Hydraulics in Sandy Soils, EGU sphere [preprint], <https://doi.org/10.5194/egusphere-2026-5107>, 2026.

4) The source code archived for this manuscript is currently not runnable due to a file path mismatch. For example, in the file `hydraulicmodel_comparison.py`, the code attempts to load data using the following line:

```
with open('2_Data/soil_Data.json') as f:
```

However, the actual folder structure provided does not match this path. The file `soil_Data.json` is located inside the `3_Data` folder rather than `2_Data`. This path discrepancy causes the model to crash immediately upon execution. The authors must update the archived repository submitted to the journal to ensure it contains a fully functional, runnable version of the code that successfully reproduces the results presented in the manuscript.

5) The hardcoded limits for the bulk soil water potential array (`h_b`) artificially restrict the model and do not account for the specific soil types (Clay, Silt Loam, Sandy Loam) evaluated in the manuscript.

In `hydraulicmodel_comparison.py`, the array is defined as:

```
h_b = -1 * np.arange(10, 15010 + 100, dx, dtype=int)
```

This implementation restricts the model evaluation strictly to a cutoff of -15,010 cm. While -15,010 cm is conventionally used as a biological threshold for the permanent wilting point, it does not represent the physical endpoint of the soil water retention curve during extended simulations, drying phases, or evaporation blocks.

While a Sandy Loam might dynamically stay close to the -15,000 cm range when dry, fine-textured soils like Silt Loam routinely extend to -30,000 cm, and Clay soils easily sustain matrix potentials moving far past -100,000 cm due to tight adsorption forces in micropores. By forcing an identical, rigid -15,000 cm boundary across all soil types, the simulation treats these diverse soil parameters as a static mathematical box rather than a dynamic environmental system. The authors must modify the code to dynamically scale `h_b` according to the specific, realistic hydraulic bounds of each soil type being tested to ensure the code matches the work presented in the manuscript.

6) There is a significant mismatch between the implementation of the leaf water pressure head calculation in the source code and Equation (7) presented in the manuscript.

Within the `Calc_hleaf(E, h_b, params_plant)` function, the final line of code executes as follows:

```
h_leaf = -1 * np.abs(E / c_x + h_x.astype(np.complex128)**(1 - tau_x))**(1 / (1 - tau_x))
```

This implementation introduces two distinct discrepancies relative to Equation (7):

1. Incorrect Reference Potential: The final Python statement passes `h_x` (the calculated potential at the root-xylem junction/stem bottom) into the leaf calculation. However, Equation (7) in the text explicitly uses `h_root` (the bulk soil/root boundary potential).

2. Inconsistent Operator Signs: The terms within the modulus in the code are added together ($E / c_x + h_x...$), whereas Equation (7) in the manuscript dictates that these terms should be subtracted.

Because Equation (7) bypasses h_x entirely, it neglects the crucial potential drop that occurs across the root domain before entering the stem xylem. The code's approach of basing the leaf potential on h_x is physically logical; therefore, it is highly likely that Equation (7) in the manuscript is mathematically incorrect and poorly formulated. The authors must carefully revise the manuscript text to ensure that Equation (7) is mathematically accurate, consistent with the physical principles of the soil-plant hydraulic model, and perfectly aligned with the actual code execution.

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PROFESSIONAL SUMMARY

Computational Hydrologist, Systems Architect, and Environmental Modeler with a proven track record of engineering high-velocity software and mathematical solutions to complex catchment anomalies. Expert in continental-scale hydrological datasets, Physics-Informed Machine Learning, and high-resolution gridded watershed frameworks. Core contributions include solo-engineering the foundational spatial integration of the multi-million-element USGS NHDPlus dataset into the United States national grid using Soil and Water Assessment Tool (SWAT), and serving as the principal technical architect behind the 3D mathematical physics modeling for Singapore's sovereign urban stormwater initiatives.

CORE TECHNICAL COMPETENCIES

Hydroinformatics Frameworks: Expert in orchestrating multi-scale water frameworks and hydroinformatics pipelines using engines like SWAT.

Geospatial Engineering: Full-stack development across ESRI enterprise ecosystems and advanced open-source spatial stacks.

Intelligent Modeling: Design and deployment of Physics-Informed Machine Learning models.

Advanced Analytics: Production-grade integration of spatio-temporal statistical pipelines, custom APIs, and advanced clustering matrices.

CONCISE CAREER TRAJECTORY & IMPACT

- **One Tool Any Country (OTAC) Global Framework (Ongoing):** Conceptualized and independently developing a multi-year global Python framework fusing surface/groundwater, water quality, and climate science with GCMs, satellite imagery, and advanced ML pipelines.
- **Continental-Scale Big Data Integration:** Executed the integration of the multi-million-element **USGS NHDPlus** watershed dataset into the United States national grid using the **SWAT**.
- **Enterprise Software Engineering Support:** Engineered custom codebase workarounds for enterprise clients directly at **ESRI Headquarters (Redlands, CA)**.
- **Sovereign Infrastructure Modeling:** Modeled 3D rain garden physics at the **National University of Singapore (NUS)**, directly defining Singapore's National Bioretention Guidelines.
- **Academic Instruction:** Delivered advanced undergraduate engineering curriculum covering core disciplines in hydrology, hydraulics, and fluid mechanics.

SCIENTIFIC SERVICE & GOVERNANCE

- **Interactive Scientific Peer Review:** Contribute analytical commentaries within the interactive open-access review platforms of **Hydrology and Earth System Sciences (HESS / European Geosciences Union)**, driving technical accountability in climate and hydrological literature (e.g., *hess-2023-275*).
- **Selected Peer-Reviewed Publication:** Mylevaganam, S., Srinivasan, R., & Singh, V. (2015). Ecohydrologically Driven Catchment Evaluation and Prioritization. *Open Journal of Applied Sciences*, 5, 325-334.

EDUCATION & CREDENTIALS

M.S. in Spatial Science (Hydrology) | Texas A&M University, USA

- MS GPA: 4.0/4.0 | Doctoral Coursework GPA: 3.78/4.0

M.Eng. in Water Engineering and Management | Asian Institute of Technology, Thailand

- Coursework GPA: 3.83/4.0 | Research GPA: 4.0/4.0

B.Sc. Eng. in Civil Engineering | University of Moratuwa, Sri Lanka

- GPA: 3.86/4.0 | First Class Honors