Diakomopoulos, F., Ragno, E., Stancanelli, L. M., and Harchowitz, M.: A general probabilistic framework for prediction of extreme flow events at river confluences, EGUsphere [preprint], https://doi.org/10.5194/egusphere-2026-5737, 2026.

The concept of dependency has often been introduced using the interplay between dependent and independent variables. This philosophical framing has been well utilized for many decades across various scientific fields, and hydrology has similarly adopted it within its domain to reflect the causal and statistical dependencies among hydrological variables. Although a variable may be categorized as independent in one context, it can become dependent when the analysis is shifted or refined into another domain or problem. Therefore, what is perceived as independent can transform into a dependency depending on the contextual boundary conditions. Ultimately, true independence is governed by nature, which defines the physical boundaries of this concept and shapes the episodes of empirical data on this planet.

In this manuscript, the authors project this concept of dependency and interdependency into the framework of river confluences in hydrology. The authors claim that predicting extreme streamflows downstream of river confluences remains largely unaddressed in the literature, and they have consequently undertaken a collaborative, multinational effort to investigate this apparent research gap. Based on the current version of the manuscript, the following points are brought forward for discussion:

1. In the current version of the manuscript, the definition of "confluence" found in the introduction [line 30] is incorrect. Furthermore, because the current phrasing suggests a misunderstanding of the concept, the authors should include an authoritative citation to support the definition. Currently, on line 30, the authors state that confluences are *"junctions in river networks where two or more tributaries merge to form a downstream river."* This definition is inaccurate. A confluence also occurs along a main river whenever a tributary connects to the main stem. For example, in the Mekong River Basin, an international transboundary river basin, the main river features confluences at junctions introduced by tributaries, such as the Tonle Sap. The definition needs to be revised to accurately reflect river network hydrology, and a relevant reference should be cited.

2. **Lines 30–31:** The authors state that streamflow downstream of a confluence is a non-linear combination of upstream contributions and categorize this process as a compound event. From the perspective of river hydrology and established nomenclature, this definition is conceptually incomplete and potentially misleading.

   While downstream streamflow inherently incorporates upstream inputs, natural river hydrodynamics dictate that flow at a confluence is governed by a mutual interaction of both upstream and downstream hydraulic conditions. A classic illustration of this mechanism is the Tonle Sap in the Mekong River Transboundary Basin, where pronounced seasonal flow reversibility causes the tributary to alternate between acting as an upstream tributary and a downstream recipient. Similar backwater effects, backwater-induced flow attenuation, and seasonal reversals are well-documented across numerous global river networks, including major systems in the United States.

   Consequently, the authors must cross-check the cited literature to support this statement [line 30-31] to ensure the context has not been misrepresented. If the

statement accurately reflects the cited source, the source itself may be conceptually flawed or insufficient to support such a generalized claim. Relying uncritically on peer-reviewed literature can propagate systemic errors, as even highly cited papers in high-impact journals occasionally contain overlooked methodological or conceptual oversights. The authors should revise this definition to align with standard hydrodynamic principles or provide robust, contextually appropriate literature to justify their framework.

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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