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Characterizing the memory of catchments: a large sample challenge?

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In hydrology, large sample approaches are often justified by the search for general rules. By accepting to focus on the forest rather than on the individual trees, we hope to address some of the generic issues that remain unsolved. The geographical distribution of catchment behaviour may help to pinpoint some causal relationships that have remained hidden or underevaluated.
The question of the memory of catchments is in my opinion a challenge for hydrology, both from the theoretical standpoint and for practical applications. Even if all hydrologists will agree that in unregulated catchments, memory is linked to the properties of the various types of aquifers, characterizing this memory (and even defining it) is not an easy task.
Here, I suggest an approach based on the assessment of streamflow's climate elasticity (Schaake & Liu, 1989; Andréassian et al., 2016) to identify within a large catchment set a long-term memory indicator that I confront to a range of physiographic and geological descriptors.

References

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