

Interactive comment on “A process-based typology of hydrological drought” by A. F. Van Loon and H. A. J. Van Lanen

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Overview:

I consider the question of drought typology to be one of significance to hydrology; it is currently the a source of confusion, and has significant practical applications, should a scientifically-based typology become available.

I found the paper to be well-written and presented, and a potentially very useful contribution.

Major Points:

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Section 4.1: How can the reader have confidence that the simulated state variables generated by the calibrated models are reliable? The models have been calibrated on flow only, using a fixed model structure. There may be other model structures which give equally good simulations, but quite different time series of soil moisture, or groundwater, or snow. This is important, because the conclusions of the paper rest heavily on modelled state variables which have not been independently validated.

Figure 14: it is not clear to me that all relevant climates can be ordered along the vertical axis, nor that all relevant climates have been included. The vertical axis is predominantly sorted by temperature, but not entirely; the introduction of precipitation to some classes make the axis harder to interpret. I am not clear where on this axis the authors would place the climate described as oceanic or maritime. Perhaps it is too much to hope that all climates can be placed within a single axis?

Minor Points:

Section 2.4 “Other land cover types are agriculture (23%), natural meadow (6%), and urban area (5%) (Oosterwijk et al., 2009). Human influence is very limited in this catchment.” It seems unusual that 23% of the land is in agriculture, and yet human influence is very limited.

Section 2.5 “This makes it a slowly responding catchment with a relatively high base-flow.” Since the discharge is only 16 mm/y, I would perhaps rephrase this as “This makes it a slowly responding catchment, with most of the runoff discharged as base-flow.”

Section 3.2: “We applied a monthly threshold derived from the 80th percentile of the monthly duration curves.” Are the results sensitive to the choice of the 80th percentile? What if you had chosen the 90th?

Section 3.2 “A inter-event time period of 10 days was used for all catchments,” Surely this time should vary with the response time of the catchment? Are the results sensitive

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to this choice?

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