

## ***Interactive comment on “Pattern, process, and function in landscape ecology and catchment hydrology – how can quantitative landscape ecology support predictions in ungauged basins (PUB)?” by B. Schröder***

### **Anonymous Referee #1**

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This paper addresses the importance of linking the scientific fields of landscape ecology and hydrology together and which possibilities to progressive research that could lead to. It points out several similar concepts already used in both scientific fields as well as how knowledge existing in one of these fields can be applied to the other field. Although several recently published papers have outlined the emergent field of eco-hydrology, this paper presents new ideas on how landscape ecology and hydrology can enrich each other and how a new interlinked approach could develop. I think the

thoughts and ideas in this paper add interesting perspectives to the already known literature and fits well into the aim of HESS to have a multi-disciplinary approach.

Although the paper aims at proposing how the two scientific fields of landscape ecology and hydrology could use concepts and scientific methodology from each other, I think the paper is somewhat biased towards presenting examples from landscape ecology and applying them on to hydrology. Otherwise the structure is clear, but section 2 is a bit overloaded with subtitles. See list of comments below.

Title: I think having the abbreviation (PUB) in the title is superfluous since it is mentioned in the Abstract and hence will be found when searched for in databases.

p 1189, l 3. The title 'Landscape ecology and catchment hydrology' proposes that this section will present how these two disciplines are linked with each other. However, I find that in this section, mainly terminology from landscape ecology is first presented, whereafter it is explained how these could be applied to hydrology. Later, under section 2.2 there are subsections where real interplay between hydrological and ecological processes and patterns within riverine landscapes are presented. I think that these subsections give more 'true' examples of interplay between hydrology and ecology than what is presented under section 2.1. Maybe this could be solved by changing titles and restructuring paragraphs. Section 2.2 nearly seems a bit unnecessary as it stands now, but I think that it is a good example of the tight connections between these two scientific fields.

p 1190, l 16 'are scale-independent' typing error? and should be 'are scale-dependent'

p 1190, l 23 title '- examples for the interaction' should rather be '- examples of the interaction'

p 1195, l 15. As I understand it this section is meant to give a good example of how hydrology can fertilize landscape ecology. Figure 2 should be part of visualizing this. I find that Figure 2 is superfluous and too abstract to reach this aim. Does Figure 2 really

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show what is stated starting on line 15? Does it show how mean plant available water improves logistic regression models compared to models neglecting it? This Figure might make its statement in the paper referred to, but it does not help the reader to understand the importance of water in this context. I would suggest deleting it.

p 1195. The footnote on this page is unnecessary. The reference is included in the text and can be found in the reference-section.

p 1196, l 23-24, Consider adding a reference like Zinko, U., J. Seibert, M. Dynesius, and C. Nilsson. Plant species density predicted by a topography based groundwater-flow index. *Ecosystems* 8: 430-441.

p 1198, l 4-11. The author states that he thinks integrated process-based models will be the most valuable progress. Why not then elaborate on this text and extend this paragraph? If this is the most interesting form of progress in the view of the author, then a more substantial presentation of these models seems interesting.

p 1198, l 27. Since the author thinks that classification into functional catchment groups would be an important step within hydrology I think this sentence could be elaborated on. How were these models used to predict the effect of climate and land use change on vegetation?

p 1189, l 29. The term wavelets is not a familiar term within landscape ecology. If this paper also intends to address landscape ecologists, I suggest explaining this further.

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