| NR | Comment | Response | To do |
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| 1 | line 17, and 109: "at the landscape level" What does this mean? | needs clarification in-text | clarify landscape level and region in terms of scale/meaning |
| 2 | line 105: "It places the landscape classification within a common framework" I don't understand this. Common with what? | needs clarification in-text | reword to clarify common in the context of different regions |
| 3 | line 108: "conceptually describe" How is this different from "describe"? | needs clarification in-text | explain the meaning of concepts/conceptualisation in the context of gaining a system understanding |
| 4 | line 217 "spatially complete". I don't understand this. | needs clarification in-text | spatially complete means there are no gaps in the spatial data, ie, all polygons/grids have associated attributes |
| 5 | line 347: "conceptual understanding". How is different from "understanding"? | needs clarification in-text | explain the meaning of concepts/conceptualisation in the context of gaining a system understanding |
| 6 | line 371: "to conceptualise and prioritise" Could be replaced with "of". | needs clarification in-text | Shortening this would detract from the main tasks in this step, which is to conceptualise the landscape in terms of its ecohydrological causal linkages, and prioritise means to identify the most important spatial features that link ecology with hydrology |
| 7 | line 380: "digraphs" I assume that you are referring to directed graphs, but a definition would help. | needs clarification in-text | add definition of digraphs in the context of qualitative models, ie. Sign directed graphs |
| 8 | Confusing, which was probably due in part to the nature of the work which spans hydrological and ecological modelling, but it was also because of the style of writing, which is wordy and vague | I can see the need for more clarifications as outlined in comments 1-7. While we already have attempted to make this paper as clear as possible, it is difficult to reduce explanatory context wording. Please also refer to our response to comment #13 for Reviewer1. | Copy edit to reduce wording and improve clarity where possible without loosing context and explanations |
| 9 | I don't think that what the authors have proposed is wrong, but I'm not sure that it is necessarily very new. I'm also concerned that it's not really tested. | please see our RC2 response on points 2. Validation and 3. Novely | |
| 10 | How have they established this for their classification system which appears to be ad-hoc? They state that their method differs from those that "apply statistical dimensionality reduction and classifications such as proximity analysis". So how can we assess their methodology? | The classification system is outlined in the methods and presented in figures 2,4,5. I am unsure how else to present the approach that would make it clearer. | |
| 11 | There is virtually no discussion of scale in the paper, which is concerning, given the importance to hydrological processes. I appreciate that the data sets that the authors have used have many differing scales, but it was not clear from the writing what the authors' scale objectives were | please see our RC2 response on points 1. Scale | |
| 12 | They refer to the "landscape level" and a "regional level landscape" (line 98), without explaining what these mean. | please see our RC2 response on points 1. Scale | provide definition of scale and its use in the context of ecological landscape analysis |
| 13 | What are the scales of the landscape groups plotted in Fig 3, and the landscape classes plotted in Figs 6a and 6b? How will the scales of their groups and classes affect the hydrological models to be developed? | please see our RC2 response on points 1. Scale | Provide additional context regarding hydrological assessment units with discussion and Figure 6a,b |
| 14 | very little discussion of the hydrological processes that will be modelled, other than their association with landscape units | This is because the paper is not a hydrological paper, but an integration paper that focusses on developing and applying an ecohydrological landscape classification. Hydrological processes come into play during the expert analysis. | Clarify in introduction about the purpose and context |
| 15 | understand the effects of the classification system on the development of the quantitative models. For example, it's interesting not to see vegetation used as a classifier for the stream uplands in Figure 2. I suppose that the authors are using a single vegetation type for these four classes | There seems to be a misconception of the classifications purpose. The stream classification is focussed on in-stream ecology, and it is not used for developing hydrological models. It is however used for analysing ecological impacts based on hydrological models. The streams are embedded within the Remnant Vegetation Habitat. The vegetation classes surrounding the streams are related to the Remnant Vegetation Habitat in figure 2. | |

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| 16 | I would also assume that the resulting hydrological model would use the same parameters for the topography and vegetation for qunatitative hydrological models of all landscape units in these classes, is that correct? | No this is not correct. The hydrological models are not directly related to the landscape classes. We refer to the hydrological changes, which are outlined in Post et al 2020 (Line 358). Landscape classes and hydrological model outputs form the inputs for the expert assessment. | |
| 17 | "The purpose of the landscape groups was to combine non-water dependent landscape classes and relate water dependent landscape classes to region specific aspects of their water dependency, which enabled conceptualisation of the landscape for modelling purposes." Again, this is vague. What type of modelling are they referring to? | modelling in this context refers to the expert assessment which develops qualitative and quantitative models. | Clarify in-text |
| 18 | In Figure 2, the "Non-floodplain or upland riverine" group is comprised of 8 different classes, which have very different vegetation types. Are the authors proposing to use their groups as a basis for their quantitative model, despite their having such great variation in the hydrological process parameters within each group? Wouldn't the uee of these groups in *any* form of modelling violate the requirement that "the characteristics within the components are more similar than the characteristics between the components"? | No. The experts use this grouping to develop impact models and they decide on the scale and detail they require. For example, if they assess upland riverine components, they will look at where in the upland rivering landscape hydrological modelling identified impacts. They then use this to prioritise/identify which landscape classes they need to develop a qualitative and subequent quantitative model. | Clarify this within discussion |
| 19 | Most importantly, there does not appear to be any attempt to validate the general approach. The authors provide examples of the use of their classification system and state that it "works" (line 471), but how do we know this? How would the approach work in a region with very different topography and/or hydrological processes, such as an alpine region, where local slope, aspect and elevation will likely dominate the hydrology, and where the hydrological processes (snow accumulation and melt, glaciers) will be very different? | Please see our response AC2 to RC2 comments, specfically section 3. Validity | |