

## ***Interactive comment on “Wetlands inform how climate extremes influence surface water expansion and contraction” by Melanie K. Vanderhoof et al.***

### **Anonymous Referee #1**

Received and published: 8 December 2017

#### General Comments

Overall, the authors address in interesting comparison in how differences in geomorphology can influence landscape surface-water responses in different ecoregions. This paper is well written and important for the field of wetland ecohydrology in the Midwestern USA. The analytical methods and statistical tools show a compelling story that the PPR contains a higher concentration of depressional basins than the NP and therefore surface water in the PPR responds very strongly to changes in climate. Most of my suggestions are areas where the authors can clarify and citations they can add to give the reader a better understanding of climate shifts in the region.

C1

#### Specific Comments

Your paper alludes to other studies that looked at the relationship between surface water and climate, but you do not cite a recent paper from the PPR. It would be helpful to cite this paper especially in your discussion about shifts in climate patterns: McKenna, O.P., Mushet, D.M., Rosenberry, D.O., LaBaugh, J.W. Evidence for a climate-induced ecohydrological state shift in wetland ecosystems of the southern Prairie Pothole Region. *Climatic Change* (2017) 145: 273. <https://doi.org/10.1007/s10584-017-2097-7>

L363-373 please clarify why climate variables are included in stage 2 of the analysis, I would think that they would be in the first stage for developing the SWCR

L471-472 how is a metric regarding amount of surface area disconnected from stream network an independent variable? Isn't this overlapping with the definition of DCW?

I would like to see something in the discussion about table 7 regarding differences in DCW vs CCW area in NP and PPR. When controlling for wetland density are there significant differences between proportion of DCW vs CCW in NP as compared to PPR? This would help specify some of the discussion points in L501-511

Table 5 seems pretty raw and could be moved to appendix. Especially since Table 8 and Table 9 are giving more advanced analyses on significant independent variables

Is it fair to use the Missouri River in Fig 5 to represent PPR? At the very least you need to specify which examples came from PPR and which came from NP in fig. 5 legend. Missouri River seems to be the border between the two regions.

The final models from Table 9 need to be used more in the discussion especially building on how CCW and DCW responses may change in the face of climate and land-use change Why in Figure 6 are Yellowstone River and tributaries so responsive to climate as compared to other CCW and DCW sites in NP? Also, isn't Devils Lake naturally a DCW and it is only CCW because of pumping into Sheyenne River?

#### Technical corrections

C2

L70-73 long and confusing sentence, consider re-wording or breaking up.

L541-552 This paragraph seems unnecessary. Either give more context or remove.

Fig 6 legend should read “DCW SWCR” and “CCW SWCR”

---

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2017-581>, 2017.