

Interactive comment on “Complex networks for streamflow dynamics” by B. Sivakumar and F. M. Woldemeskel

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I found the manuscript to be well written and innovative. Understanding network connectivity is critical in hydrology, particularly for the estimation of streamflow at ungaged locations as well as for assessing gaps and redundancies in monitoring networks. This manuscript provides a comprehensive look at the US streamgaging network using a novel approach for this assessment.

It should be noted that correlation between streamflow time series has been completed for the United States as part of a recent network analysis conducted by Kiang et al. (2013). This study looked at correlations between daily streamflow but did not take the next step of using a network-based approach, as presented in this manuscript. I

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believe this report is worth reviewing and citing because the results support much of the observations made here.

I suggest this manuscript be accepted subject to only minor revision.

Minor comments:

1. Section 3: Please clarify which dataset of streamgages were used and if the streamgages were considered to have relatively unaltered contributing catchments. Also state how the monthly values were computed (sum, mean, etc).
2. Section 3 list of observations: How do these observations link to any potential biases in your results or hypotheses about network connections?
3. Section 4: By “linear correlation-based analysis,” do you mean the Pearson correlation coefficient? If so, did you take the logarithms of the streamflow values before computing the correlations?
4. There was a recent publication in HESS that also looked at distance as a proxy for similarity in the US streamgage network. I believe this paper should also be cited (Sopan and Stieglitz, 2012).

References:

Kiang, J.E., Stewart, D.W., Archfield, S.A., Osborne, E.B., and Eng, Ken, 2013, A national streamflow network gap analysis: U.S. Geological Survey Scientific Investigations Report 2013–5013, 79 p. plus one appendix as a separate file, available at: <http://pubs.usgs.gov/sir/2013/5013/>.

Patil, S. and M. Stieglitz (2012), Controls on hydrologic similarity: role of nearby gauged catchments for prediction at an ungauged catchment, *Hydrology and Earth System Sciences*, 16, 551-562, doi:10.5194/hess-16-551-2012.

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