Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-491-RC2, 2019

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Contribution of low-frequency climatic/oceanic oscillations to streamflow variability in small, coastal rivers of the Sierra Nevada de Santa Marta (Colombia)" *by* Juan Camilo Restrepo et al.

Anonymous Referee #2

Received and published: 1 February 2019

This study evaluates the influence of low-frequency oscillations linked to large-scale oceanographic-atmospheric processes, on streamflow variability in small tropical coastal mountain rivers of the Sierra Nevada de Santa Marta, Colombia. By using spectral analysis and Hilbert Huang transform, the study aims to (1) explore temporal characteristics of streamflow variability, (2) estimate the net contribution to the energy spectrum of low-frequency oscillations to streamflow anomalies, and (3) analyze the linkages between streamflow anomalies and large-scale, low-frequency oceanographic/atmospheric processes.

The main topic of the article is important to Hydrology and water resource management, and deserves to be published in HESS. However, the results need to be discussed in a broader context, comparing the main findings with related literature. The tools applied to address the research questions are adequate and properly applied, however some technical details are necessary to be described. In addition, a deeper explanation about the physical mechanisms linking PDO, AMO, TNA and the basins' hydrology is necessary. Also, the whole subject is about the possibility of a cause-effect relation between decadal oscillations and streamflow, but the concept of phase locked signals is completely missing in the interpretation of the results and the discussion, which I think is necessary. Thus, my decision is accepted with major revisions.

Specific comments:

- First paragraph: a more in-depth description on the PDO-ENSO relation is necessary in addition to AMO and TNA relations to inter-annual oscillations.

- Second paragraph: the main idea is confusing. Maybe split paragraphs one for novel statistical methods and another related to the hydrology in Colombia.

- Third paragraph: to keep the logic of the manuscript the main objectives ought to be aligned with the sub-sections presented in section 4.

- Pag. 4 line 30: explain the main difference between XWT and WTC.

- Pag. 7 line 10: equation (7) may be wrong.

- Pag. 8 line 6-7: from Fig. 2 the statement is not evident for station Frío, please explain.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-491, 2018.