

Interactive comment on “Role of moisture transport for Central American precipitation” by Ana María Durán-Quesada et al.

Anonymous Referee #2

Received and published: 8 January 2017

The manuscript discusses the climatological behavior of large-scale and regional moisture sources for Central America. The results are clearly explained and are of great relevance to the scientific community in Central America and other regions of the world. I recommend to accept the manuscript after a few minor changes have been made.

General Comments

Due to its importance, and because it is also mentioned at the Introduction, the authors should include a few comments about how they think their results could be used by the forecast community in the near future. Their results are indeed very important for this community and the fact that there is good predictability for certain low-level jets (LLJs) in the region is something other people could take advantage of. Forecast conditioned on the behavior of LLJs and moisture availability from the sources here identified could

C1

be a promising way forward.

The authors should emphasize the period used to compute the trends. Section 3.4 starts with a reference to climate change, and then the trends referenced in the analysis could be confused by some readers to long-term (climate change) trends. Related to that comment, I think it is important to clarify somewhere at the beginning of Section 3.4 that climate change is just a part of the whole signal observed, as natural climate variability has also a role in the analysis performed by the authors.

Specific Comments

L50-51: Please explain what do you mean by “highly active stratified precipitation”.

L53-54: The authors can also cite the work of Moron et al. (2016). Moron, V., Gouirand, I. & Taylor, M. *Clim Dyn* (2016) 47: 601. doi:10.1007/s00382-015-2858-9

L104: Is the CJ index computed also using zonal wind for that region? Or meridional?

L152: Capital “t” for “The transport of moisture...”

L224: The Orinoco river basin is present in both Colombia and Venezuela. I suggest you indicate where the Mapire river mouth is, just to quickly provide a geographical reference to the reader.

L338: As indicated before, I suggest you mention as soon as possible in this section that the trends correspond to a relatively short period of time, so there is no confusion with long-term trends associated with climate change. Also, I recommend you mention that these trends are due to the contribution of climate change AND natural climate variability at different timescales. Future research could analyze the physical mechanisms behind these trends.

L373-374: Yes, but that does not mean that climate change is the only or even the main cause.

L431-432: The authors can cite the work of Mapes et al. (2003) and Munoz et al.

C2

(2016) as concrete examples of how a LLJ modulates moisture availability and promotes (deep) convection.

Mapes et al. Diurnal Patterns of Rainfall in Northwestern South America. Part I: Observations and Context. *Mon. Wea. Rev.* 131, 799-812, 2003.

Munoz et al. (2016). <http://dx.doi.org/10.1016/j.atmosres.2015.12.018>

L451: The increase...

Figure 4 (caption): I think the authors mean “lower panel” rather than “right hand” panel.

Interactive comment on *Earth Syst. Dynam. Discuss.*, doi:10.5194/esd-2016-66, 2016.

C3