

Interactive comment on “Hydrometeorological Conditions Leading to the 2015 Salgar Flash Flood: Lessons for Vulnerable Regions in Tropical Complex Terrain” by Carlos D. Hoyos et al.

Anonymous Referee #2

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The current manuscript deeply studies the different meteorological conditions preceding the flash flood that occurred the 18th May 2015 in Salgar (Colombia). It gathers information not only from observations but also from models or Synoptics patterns which could help to classify similar situations in future events. This information is clearly presented and allows the reader to follow the different factors that lead to that terrible event. I think the paper deserves publication due to the amount of information and valuable conclusions or lessons that can be extracted from it. I have some minor comments that could be addressed before its publication.

The figures might need some improvement to make them more understandable, most

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of the comments about the figures have been already addressed by other reviewers. I would recommend to include the time of the event in temporal figures such as Fig 10e and Fig 10f. It could also help in Figure 14 but it is not that necessary.

The concept of flash-flood is usually defined as: "a flood of which peak appears within, in general, six hours from the onset of torrential rainfall" (NOAA). I would recommend introducing this definition at the beginning of the paper (Pag 2, l 35) and try to distinguish between the preconditioning raining events (This could be the main events before 17th May at night) and the rainfall that actually caused the flash-flood event.

Pag 6, l135-136: The "high" correlation between the QPE and observations does not guarantee high reliability of the derived radar precipitation. In fact, any bias would not affect the correlation. Besides, in your Figure 2 can be observed a clear overestimation of the radar QPE (Surprising taking into account sentence l325 about rainfall underestimation). Try to remove this sentence or make it clear what is your real point.

Pag 7 l152-154: Please, rephrase this ending. It is unclear.

Pag 7 l 158: It is mentioned the satellite for issuing warnings to the public. This comment is fine but I am surprised there is no comment about the capability of both Satellite (and mostly radar) for providing early warning for rainfall events by using extrapolation techniques or cell tracking techniques. Maybe it is worthy to include some information about these techniques. I understand that testing these techniques are out of the scope of this paper but still, a comment may help future readers.

Pag 12 l 287: "Flash-floods ... are more likely during the MAM quarter. Reference or statistic proving that sentence?

Pag 26 l 470-471. 5-years radar record is not enough to reach strong conclusions. This point has been addressed by the other reviewer. I recommend to introduce it here as a weak point fo your study.

WRF section. It is proved that WRF had a good potential in the given case but it is

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known that the orography plays a significant role in precipitation in WRF model and in this case, so it could be that WRF is quite often producing a similar pattern over the mountaneous regions. Consequently, to give predictive value to WRF for flash flood, other events were similar synoptic patterns but not flash flood occurred should be introduced in the section and prove WRF did not predict similar patterns or intensities.

Discussion and conclusion section. I am missing some hydrological information of the basin, such as the peak time of the basin, and also some information about the required lead-time required for mitigation of the flash-flood in the studied region. I think this is an important matter when trying to investigate conditions to alert for future flash-flood in the region. And also, an explanation of how to derive this lead-time required. The combination of these two times (peak and warning) is really important, in some large basins, the peak time is so long that observations are enough to issue warning systems. In other, nowcasting can do the work while in other is so short that NWP models or synoptic factors are required for this warning to be effective. I think this is important to be introduced in the paper.

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