Hydrology and Earth System Sciences Discussions

Interactive comment on "Rain event properties and dimensionless rain event hyetographs at the source of the Blue Nile River" *by* A. T. Haile et al.

Anonymous Referee #2

Received and published: 15 October 2010

In the presented study, the authors performed several statistical analyses toward the precipitation data they gathered in the Gilgel Abbay watershed in Ethiopia. By separating the rainfall records into various events, the statistics of depth, duration, mean intensity, peak intensity, and inter-event time of all events are reported. The dimensionless event hyetographs are also derived based on the data they collected.

Major Concerns

1. Since the gauge observation is relatively scarce in the study area, the statistics provided in this paper seem to be valuable for Ethiopia. However, the data length is too limited to support the analysis of rainfall events. It should be noted that the authors selected a very low (30-minute) minimum inter-event time (MIT) criterion to separate

their rainfall events, while 6∼8 hour MIT were generally adopted in the previous studies. Therefore, if making such an adjustment, the amount of rainfall events could be dramatically lowered to support a meaningful analysis. Of course, the selection of MIT is somewhat subjective, mainly depending on the purpose of study. From the hydrologic point of view, one would be more interested to study the behavior of observed rainfall events that can be used in the surface water modeling. Hence, 6∼8 hour MIT is more reasonable since it provides sufficient time to generate the surface runoff. If MIT is too small, the rainfall observation should be classified into a single event since they would likely contribute to the same flood peak.

2. It is also very disappointing to see that the authors tried to make a case based on insufficient data (ten stations with two years of data from 2007 to 2008), neglecting the fact that the annual variability of rainfall is typically very large. Therefore, the scientific insights provided in this study could be biased, even though the procedures and methods are appropriate. Furthermore, the authors should also address what the major and different contribution of this paper provides comparing to their prior publication (Haile et al., 2009). In my personal opinion, the fundamental information of observed precipitation has been addressed sufficiently in Haile et al. (2009), so the regional data scarcity should not be used as a major contribution again in this paper.

3. The usage of "conditional probability" in Section 3.3 is unclear and ambiguous. I.e., conditional probability of what? In addition, from Eq. (9), Pij should be always equal to Pji. The authors should check if the formulation of Eq. (9) is what they want.

Other Minor Issues

1. It seems that all table captions are misplaced by the figure captions in the version I received. It needs to be fixed as soon as possible.

2. P5806, L25: Should it be Zeng et al., 1996?

3. P5808, L4: Bras (1979) is missing in the Reference section.

4. P5829, L13: The last few sentences are unsupported. The authors should not include their speculation as a part of the Conclusion.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 5805, 2010.

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