Interactive comment on "Development and Evaluation of a Stochastic Daily Rainfall Model with Long Term Variability" *by* A. F. M. Kamal Chowdhury et al.

A. F. M. Kamal Chowdhury et al.

garry.Willgoose@newcastle.edu.au

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1. In Figure 1, I guess that green signifies coastal, yellow inland and red monsoonal areas. - Yes, the shaded green, yellow and red colours indicate the coastal, inland and monsoonal areas respectively. We will add these colours and information in the legend of Figure 1.

2. Are 12 stations enough to warrant statistical significance? - The two stations in this paper are simply used to exemplify the model development for two contrasting climates. We do not claim that the analysis here is statistically significant. The 12 stations shown in Figure 1 just represent a wide-range of climate characteristics of Australia. A thorough analysis of these and ~40 stations around Sydney are the subject

of a paper in prep. WE've simply included this figure in this paper for consistency with this forthcoming paper, to show the locations of the two example site in this paper.

3. Is there an inherent difference in the rainfall in Sydney and Adelaide that their P11 and mu variability is so different? - Risbey et al (2009) investigated the influence of large-scale climate drivers on Australian rainfall. Figure 15 of Risbey et al (2009) showed that the major drivers of rainfall in Sydney and Adelaide are different to each-other for all seasons. For example, the summer (December-February) rainfall in Sydney region is mainly influenced by El Niño Southern Oscillation, while the summer rainfall in Adelaide region is mainly influenced by Indian Ocean dipole. Since, the climates of Sydney and Adelaide are influenced by different large-scale drivers, the rainfall variabilities are also different in these two locations, which have been reflected in the P11 and μ variabilities of Figure 2 of our paper.

4. Color in Figures 2-12 is un-necessary. - Yes, as we have used the distinctive lines and markers in the Figures 2-12, the colours are not essential. We will remove the colours for printed version.

5. What is the significance of the shading in Figure 5 and 12? - The shadings in Figure 5 and 12 indicate 95% confidence interval. We will add this information in the captions of Figure 5 and 12.

6. In your Conclusions (section 9) you contend that DHMC is better than the other MC models. Can you quantify this conclusion? - Only DHMC has satisfactorily reproduced both rainfall depths and wet periods variabilities at all resolutions for both Sydney and Adelaide with average of the absolute values of Z scores less than 2 (see the Table 2 below). The other four MC models failed to reproduce both rainfall depths and wet periods variabilities consistently at all resolutions and for all sites.

7. Instead of having many figures is it possible to summarize a few as in tables for easier recognition – example Figure 11? - In revised version of the paper, we will add summary tables for both sites as 'Table 2' as in the attachment to this response.

8. Lastly why choose Adelaide and Sydney – is there a reason? - The Adelaide and Sydney data are used because they provide a contrast between a highly seasonal Mediterranean climate with low inter-decadal variability in Adelaide and a relatively non-seasonal climate with high inter-decadal variability in Sydney (see response to Comment 3).

9. References Risbey, J.S., Pook, M.J., McIntosh, P.C., Wheeler, M.C. and Hendon, H.H.: On the Remote Drivers of Rainfall Variability in Australia, Monthly Weather Review, 137, 3233–3253, doi: 10.1175/2009MWR2861.1, 2009.

Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/hess-2017-84/hess-2017-84-AC1-supplement.pdf

C3